BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

DOCKET NO. R-2024-3045192

AND

DOCKET NO. R-2024-3045193

PREPARED DIRECT TESTIMONY

OF

HAROLD WALKER, III

REGARDING

RATE OF RETURN AND CASH WORKING CAPITAL

VEOLIA WATER PENNSYLVANIA, INC.

February 2024

VWPA STATEMENT NO. 4
DIRECT TESTIMONY OF HAROLD WALKER
REGARDING RATE OF RETURN AND CASH WORKING CAPITAL

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OVERALL RATE OF RETURN TERMS, ABBREVIATIONS AND ACRONYMS

Terms, Abbreviations and Acronyms	Defined
CAPM	Capital Asset Pricing Model
Commission	Pennsylvania Public Utility Commission
Company	Veolia Water Pennsylvania, Inc.
Comparable Companies	Water Group Followed by Analysts
Comparable Group	Water Group Followed by Analysts
Cost of Capital	Investor-required cost rate
DCF	Discounted Cash Flow
DPS	Dividend per share
EPA	U.S. Environmental Protection Agency's
EPS	Earnings per share
Financial Risk	Leverage
GICS	Global Industry Classification System
IOU	Investor Owned Utilities
Leverage	Fixed cost capital
Long-term U.S. Treasury Securities	Base Risk-Free Rate
M/B	Market-to-Book Ratios
Moody's	Moody's Investors Service
NARUC	National Association of Regulatory Utility Commissioners
Non-Systematic Risk	Company-Specific Risk
PUC	Pennsylvania Public Utility Commission
ROE	Return on Equity
RP	Risk Premium
S&P	Standard & Poor's
SIC	Standard Industrial Classification
Systematic Risk	Non-Diversifiable Risk
Value Line	Value Line Investment Survey
VUR	Veolia Utility Resources LLC
VWPA	Veolia Water Pennsylvania, Inc.
Water Group	Water Group Followed by Analysts

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REGARDING RATE OF RETURN AND CASH WORKING CAPITAL

INTRODUCTION

Q. Please state your name and business address.

A. My name is Harold Walker, III. My business address is 1010 Adams Avenue, Audubon, Pennsylvania 19403.

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

A. I am employed by Gannett Fleming Valuation and Rate Consultants, LLC as Manager, Financial Studies.

Q. What is your educational background and employment experience?

A. My educational background, business experience and qualifications are provided in Appendix A.

SCOPE OF TESTIMONY

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to recommend an appropriate overall rate of return that Veolia Water Pennsylvania, Inc. ("VWPA" or the "Company") should be afforded an opportunity to earn on its water service rate base. Additionally, the reason of my testimony is to recommend an appropriate cash working capital allowance that VWPA should be afforded an opportunity to earn on as part of its rate base claim. My cash working capital

recommendation is based upon the results of a lead-lag study that was performed under my direct supervision.

My testimony regarding rate of return is supported by Exhibit HW-1, which is composed of 19 Schedules. I have also prepared Exhibit HW-2 which contains the 28 supporting schedules, identified as Schedule HW-1 through Schedule HW-28, summarizing the Company's cash working capital requirement in this proceeding.

Therefore, when discussing rate of return and I refer to a schedule, I am referring to the schedules contained in Exhibit HW-1 unless noted otherwise. Conversely, when discussing the Company's cash working capital requirement and I refer to a schedule, I am referring to the schedules contained in Exhibit HW-2 unless noted otherwise.

SUMMARY OF RATE OF RETURN RECOMMENDATION

Q. What is your recommended cost of equity?

A. My recommendation is that VWPA be permitted an overall rate of return of 7.95%, including a 10.80%[1] cost of common equity, based upon the Company's capital structure projected at October 31, 2025. My recommended cost of common equity reflects VWPA's unique risk characteristics.

[1] It should be noted that my current analysis contained in Exhibit HW-1 supports a cost of common equity of 10.80% for the Company. The Company's filing includes an overall rate of return of 7.95% and a 10.80% cost of common equity for filing purposes to minimize the requested revenue increase.

Q. How did you determine your recommended common equity cost rate?

A. I used several models to help me in formulating my recommended common equity cost rate including Discounted Cash Flow ("DCF"), Capital Asset Pricing Model ("CAPM") and Risk Premium ("RP").

Q. Is it important to use more than one market model?

A. Yes. It is necessary to estimate common equity cost rates using a number of different models. At any given time, a particular model may understate or overstate the cost of equity. While any single investor may rely solely upon one model, different investors rely on different models and many investors use multiple models. Therefore, because the price of common stock reflects a number of valuation models, it is appropriate to estimate the market-required common equity cost rate by applying a broad range of analytical models.

Q. Please summarize your common equity cost rate recommendation.

A. There is no market data concerning VWPA's shares of common stock because VWPA shares of common stock are not publicly traded. Accordingly, due to the lack of market data concerning VWPA's equity, I used a comparable group of publicly traded companies to estimate the common equity cost rate. Based upon the results of my entire analysis, I conclude VWPA's current common equity cost rate is at least 10.80%. The

current range of common equity cost for VWPA is 9.45% (DCF), 11.75% (CAPM), and 11.35% (RP). Value Line Investment Survey ("Value Line") is relied upon by many investors and is the only investment advisory service of which I am aware that projects earned return on equity. As a check on the reasonableness of my common equity cost rate recommendation, I reviewed Value Line's projected returns on common equity for comparable utilities. Value Line's projected earned returns on common equity for my comparable utilities average 10.7% and the median is 10.3%. The range of the projected returns suggests that my recommendation that VWPA be permitted an opportunity to earn 10.80% is reasonable, if not conservative.

PRINCIPLES OF RATE REGULATION AND FAIR RATE OF RETURN

Q. What are the principles guiding fair rates of return in the context of rate regulation?

A. In a capitalistic or free market system, competition determines the price for all goods and services. Utilities are permitted to operate as monopolies or near monopolies as a tradeoff for a ceiling on the price of service because: (1) the services provided by utilities are considered necessities by society; and (2) capital-intensive and long-lived facilities are necessary to provide utility service. Generally, utilities are required to serve all customers in their service territory at reasonable rates determined by regulators. As a result,

regulators act as a substitute for a competitive-free market system when they authorize prices for utility service.

Although utilities operate in varying degrees as regulated monopolies, they must compete with governmental bodies, non-regulated industries, and other utilities for labor, materials, and capital. Capital is provided by investors who seek the highest return commensurate with the perceived level of risk; the greater the perceived risk, the higher the required return rate. In order for utilities to attract the capital required to provide service, a fair rate of return should equal an investor-required, market-determined rate of return.

Q. What constitutes a fair rate of return?

A. Two noted Supreme Court cases define the benchmarks of a fair rate of return. In *Bluefield*[2], a fair rate of return is defined as: (1) equal to the return on investments in other business undertakings with the same level of risks (the comparable earnings standard); (2) sufficient to assure confidence in the financial soundness of a utility (the financial integrity standard); (3) adequate to permit a public utility to maintain and support its credit, enabling the utility to raise or attract additional capital necessary to provide reliable service (the capital attraction standard). The second case, *Hope*[3],

[2]Bluefield Water Works & Improvement Company v. P.S.C. of West Virginia, 262 U.S. 679 (1923).

[3]Federal Power Commission v. Hope Natural Gas Company, 320 U.S. 591 (1944).

determined a fair rate of return to be based upon guidelines found in *Bluefield* as well as stating that: (1) allowed revenues must cover capital costs including service on debt and dividends on stock; and (2) the Commission was not bound to use any single formula or combination of formulae in determining rates. Utilities are not entitled to a guaranteed return. However, the regulatory-determined price for service must allow the utility a fair opportunity to recover all costs associated with providing the service, including a fair rate of return.

INVESTMENT RISK

Q. Previously, you referred to risk. Please define the term risk.

A. Risk is the uncertainty associated with a particular action; the greater the uncertainty of a particular outcome, the greater the risk. Investors who invest in risky assets expose themselves to investment risk particular to that investment. Investment risk is the sum of business risk and financial risk. Business risk is the risk inherent in the operations of a business. Assuming that a Company is financed with 100% common equity, business risk includes all operating factors that affect the probability of receiving expected future income such as: sales volatility, management actions, availability of product substitutes, technological obsolescence, regulation, raw materials, labor, size and growth of the market served, diversity of the customer base, economic activity of the area served, and other similar factors.

Q. What is financial risk?

A. Financial risk reflects the manner in which an enterprise is financed. Financial risk arises from the use of fixed cost capital (leverage) such as debt and/or preferred stock, because of the contractual obligations associated with the use of such capital. Because the fixed contractual obligations must be serviced before earnings are available for common stockholders, the introduction of leverage increases the potential volatility of the earnings available for common shareholders and therefore increases common shareholder risks.

Although financial risk and business risk are separate and distinct, they are interrelated. In order for a company to maintain a given level of investment risk, business risk and financial risk should complement one another to the extent possible. For example, two firms may have similar investment risks while having different levels of business risk, if the business risk differences are compensated for by using more or less leverage (financial risk) thereby resulting in similar investment risk.

DESCRIPTION OF VWPA

Q. Please give a brief description of the Company.

A. VWPA is a private or investor-owned company. VWPA is a regulated public utility that provides water and wastewater service to about 66,000 (12/31/22) customers located in its franchise territories in the

Commonwealth of Pennsylvania, in a portion of Columbia, Cumberland, Dauphin, Luzerne, Montour, Perry, Schuylkill, Wyoming, and York Counties. The price of service of VWPA is regulated by the Pennsylvania Public Utility Commission ("Commission" or "PUC").

VWPA is a wholly-owned subsidiary of Veolia Utility Resources LLC ("VUR"). VUR is the sole source of VWPA's external capital. VUR owns and provides services to water and wastewater utility companies which are located throughout the United States (e.g., VWPA). VUR was founded in 1869 and is based in Paramus, New Jersey. VUR is a subsidiary of Veolia Utility Parent, Inc., which is a subsidiary of Veolia North America, Inc.

Veolia North America, Inc. is a wholly-owned subsidiary of Veolia Environnement S.A: Veolia Environnement S.A. is a French transnational company with activities in three main service and utility areas: water management, waste management and energy services.

THE INDUSTRY

Q. Please give a brief overview of the industry in which the Company operates.

A. VWPA operates in the water supply industry and the wastewater utility industry. The water supply industry has a Standard Industrial Classification ("SIC") code of 4941, has water utilities, and includes establishments primarily engaged in distributing water for sale for residential, commercial,

and industrial uses. Government controlled establishments such as municipalities, public service districts and other local governmental entities dominate the industry. Private companies or investor owned utilities ("IOU") are active in the construction and improvement of water supply facilities and infrastructure. There are currently about 11,000 U.S. Businesses with a SIC code of 4941.

A comparative industry to the water supply industry is the wastewater supply industry. The wastewater utility industry has a Standard Industrial Classification ("SIC") code of 4952 (Sewerage Systems), has sewer utilities, and includes establishments primarily engaged in the collection and disposal of wastes conducted through a sewer system, including such treatment processes as may be provided. There are currently about 2,200 U.S. Businesses with a SIC code of 4952.

The water supply industry is the most fragmented of the major utility industries with more than 53,000 community water systems in the U.S. (83% of which serve less than 3,300 customers). The nation's water systems range in size from large municipally owned systems, such as the New York City water system that serves approximately 9 million people, to small systems, where a few customers share a common well.

According to the U.S. Environmental Protection Agency's ("EPA") most recent survey of publicly-owned wastewater treatment facilities in 2008, there are approximately 15,000 such facilities in the nation, serving

approximately 74% of the U.S. population. Ninety eight percent of domestic wastewater systems are government owned rather than IOUs. Currently, there are no wastewater utility companies that have actively traded stock.[4]

An estimated 16% of all water supplies are managed or owned by IOUs. IOUs consist of companies with common stock that is either actively traded or inactively traded, as well as companies that are closely held, or not publicly traded. Currently, there are only about nine investor owned water utility companies with publicly traded stock in the U.S.

The water utility industry's and wastewater utility industry's increased compliance with state and federal water purity levels and large infrastructure replacements are driving consolidation of the wastewater utility and water utility industries. Because many wastewater utility and water utility operations do not have the means to finance the significant capital expenditures needed to comply with these requirements, many have been selling their operations to larger, financially stronger utilities.

The larger IOUs have been following an aggressive acquisition program to expand their operations by acquiring smaller wastewater and water systems. Generally, they enter a new market by acquiring one or several wastewater or water utilities. After their initial entry into a new market, the larger investor-owned water utility companies continually seek

[4]Many of the publicly traded water utility stocks also own some wastewater utilities but there are no publicly traded utility stocks which are comprised solely of wastewater utilities.

to expand their market share and services through the acquisition of wastewater and water utility businesses and operations that can be integrated with their existing operations. Such acquisitions may allow a company to expand market share and increase asset utilization by eliminating duplicate management, administrative, and operational functions. Acquisitions of small, independent utilities can often add earning assets without necessarily incurring the costs associated with the Safe Drinking Water Act ("SDWA") [5] if such acquisitions are contiguous to the potential purchaser.

In summary, the result of increased capital spending, to meet the SDWA and CWA requirements and replace the aging infrastructure of many systems, has moved the wastewater and water industries toward consolidation. Moreover, Federal and State regulations and controls concerning water quality are still in the process of being developed and it is not possible to predict the scope or the enforceability of regulations or standards which may be established in the future, or the cost and effect of existing and potential regulations and legislation upon VWPA. However, as a small to medium size water and wastewater system, VWPA faces the cost

[5]The SDWA is the principal federal law in the United States intended to ensure safe drinking water for the public. Pursuant to the act, the EPA is required to set standards for drinking water quality and oversee all states, localities, and water suppliers who implement these standards. The CWA, or Clean Water Act, is the primary federal law in the United States governing water pollution. The CWA's objective is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands.

of compliance with less financial resources when compared to larger IOU water utilities.

COMPARABLE GROUP

Q. How do you estimate the cost of common equity for VWPA?

A. VWPA's common stock is not publicly traded. Accordingly, I employed a comparable group of utility companies with actively traded stock, to determine a market-required cost rate of common equity capital for VWPA. Since no companies are perfectly identical to VWPA, it is reasonable to determine the market-required cost rate for a comparable group of utility companies and adjust, to the extent necessary, for investment risk differences between VWPA and the comparable group.

Q. How did you select the comparable group used to determine the cost of common equity for VWPA?

A. I selected a comparable group of water utilities to determine the cost of common equity for VWPA considering security analysts' coverage. Unlike the other utility industries, only a portion of the IOU water companies with publicly traded stock in the U.S. are followed by security analysts. Coverage by security analysts is important when determining a market required cost of common equity. Accordingly, security analysts' coverage was considered when selecting my comparable group. I selected my water utility comparable group, Water Group Followed by Analysts ("Water

Group"), based upon a general criteria that includes: (1) all U.S. water utilities that are covered by security analysts as measured by the existence of sources of published projected five-year growth rates in earnings per share ("EPS"); (2) with a Standard Industrial Classification (SIC) of 4941 (i.e., Water Supply Facilities and Infrastructure); (3) with a North American Industry Classification System (NAICS) of 221310 (i.e., Water Supply and Irrigation Systems); (4) are not the announced subject of an acquisition; (5) currently pay a common dividend and have not reduced their common dividend within the past four years; (6) have market value of common stock, the product of multiplying the closing stock price by the number of common shares outstanding, greater than $500.0 million; and (7) have a total enterprise, the sum of market value, preferred stock and total debt, greater than $700.0 million.

It should be noted that the Water Group is also referred to as the Comparable Group and/or the Comparable Companies.[6] The names of the utilities that comprise the Comparable Group and their bond or credit ratings are listed in Table 1.

[6]All of the Comparable Companies also provide some wastewater service.

Bond and Credit Ratings for
The Water Group Followed by Analysts

Water Group Followed by Analysts	S&P Credit Rating
American States Water Co	A+
American Water Works Co Inc	A
California Water Service Gp *	A+
Essential Utilities, Inc.	A
Middlesex Water Co	A
SJW Corp	A-
York Water Co	A-
Average	A

* - The A+ bond rating is that for California Water Service, Inc.

Table 1

Q. Why did you include not being the subject of an acquisition as a criteria for the Water Group?

A. To begin with, there are only about nine investor owned water utility companies with publicly traded stock in the U.S., and some of these companies are very small. As stated previously, the IOU water industry receives only limited exposure on Wall Street.

Additionally, the merger activity in the water industry can result in abnormal or "tainted" stock prices in terms of a DCF analysis because premiums are typically paid in corporate acquisitions. That is, when a tender offer is made for the purchase of all the outstanding stock of a

company, the amount of that offer usually exceeds the price at which the stock was previously traded in the market. These large premiums are often reflected in the prices of other water utilities that are not currently the announced subject of an acquisition.[7]

CAPITAL STRUCTURE

Q. What is required to develop an overall rate of return?

A. The first step in developing an overall rate of return is the selection of capital structure ratios to be employed. Next, the cost rate for each capital component is determined. The overall rate of return is the product of weighting each capital component by its respective capital cost rate. This procedure results in VWPA's overall rate of return being weighted proportionately to the amount of capital and cost of capital of each type of capital.

Q. Does VWPA directly raise or issue its own debt capital?

A. No, prospectively VWPA does not raise its own capital; rather VUR is the sole source of VWPA's external capital.

[7] Multiple publications mention these impacts including Research Magazine – April 2010, Barron's – March 2001, Utility Business – June 2002, Value Line Investment Survey – April 2013, and Wastewater Digest, March 2022.

Q. What capital structure ratios are appropriate to be used to develop VWPA's overall rate of return?

A. Consistent with settled rate setting principles, I believe it is necessary to evaluate VWPA's current cost of capital based on VUR's projected October 31, 2025 capital structure, which includes 46% debt and 54% common equity as reflected in Schedule 1.

Q. Is there a set of regulatory and financial principles used in deciding the appropriate capital structure to use for cost of capital purposes?

A. Yes. There is a general set of regulatory and financial principles used in deciding the capital structure issue for cost of capital purposes that are consistent with both regulatory and financial theories:

1) It is generally preferable to use a utility's actual capital structure in developing its rate of return. However, in deciding whether a departure from this general preference is warranted in a particular case, it is appropriate to first look to the issue of whether the utility is a financially independent entity. In determining whether a utility is a financially independent entity or self-financing, it is important to look to whether the utility:

- has its own bond rating;
- provides its own debt financing; and
- debt financing is <u>not</u> guaranteed by a parent company.

2) When a utility issues its own debt that is not guaranteed by the public or private parent and has its own bond rating, regulatory and financial principles indicate to use a utility's own capital structure, unless the utility's capital structure is not representative of the utility's risk profile or where use of the actual capital structure would create atypical results. Regulatory and financial principles involve determining whether the actual capital structure is atypical when compared with the capital structures approved by the Commission for other utilities that operate in the same industry (*i.e.,* water utility, gas distribution utility, etc.), as well as those of the proxy utility companies that operate in the same industry.

3) For utility subsidiaries without publicly traded stock, the manner in which the utility obtains its debt financing determines whether it does its own financing. Public Utility Commissions generally determine if a subsidiary has financial, operational, and managerial relationships with its parent entity. However, having such ties typically has not led to use of a parent's capital structure for regulatory purposes, unless the subsidiary utility issues no long-term debt, issues long-term debt only to its parent, or issues long-term debt to outside investors only with the guarantee of its parent.

4) If a utility does not provide its own financing, Public Utility Commissions often look to another entity. Generally, Public Utility

Commissions use the actual capital structure of the entity that does the financing for the regulated utility as long as it results in just and reasonable rates. This generally means using a parent company.

5) If the parent's capital structure is used, because it finances the operation of the utility, regulatory and financial principles require adjustments in the utility's allowed rate of return on equity to adjust for risk differences, if any, between the parent and the regulated subsidiary. If, however, the financing entity's capital structure is inconsistent relative to the capital structures of the publicly-traded proxy companies used in the cost of equity analysis and capital structures approved for other utilities that operate in the same industry (*i.e.,* water utility, gas distribution utility, etc.), Public Utility Commissions employ a hypothetical capital structure.

Once the cost of equity for the proxy companies is determined, thereby establishing a range of reasonable returns, Public Utility Commissions should determine where to set the utility's return in that range based upon how the utility's risk compares with that of other utilities that operate in the same industry (*i.e.,* water utility, gas distribution utility, etc.). The risk analysis begins with the assumption that the utility generally falls within a broad range of average risk, absent highly unusual circumstances that indicate an inconsistently high or low risk as compared to other utilities that operate in the same industry (*i.e.,* water utility, gas distribution utility,

etc.). Generally, financial risk is a function of the amount of debt in an entity's capital structure used for cost of capital purposes. When there is more debt, there is more risk.

Q. How does your recommended capital structure compare with ratios employed by other investor-owned companies?

A. The capital structure I recommend for VWPA reflects a common equity ratio of 54% which is similar to the range of the ratios employed by other investor-owned water companies as shown on pages 1 and 2 of Schedule 2. A comparison of my recommendation for VWPA's capital structure ratios to those recently employed by the Comparison Group is shown in Table 2.

Comparison of Capital Structure Ratios

	VWPA	Water Group	
	Pro Forma at 10/31/2025	At 6/30/2023	Projected 2027
Debt	46.0	50.4	47.7
Preferred Stock	0.0	0.1	0.0
Common Equity	54.0	49.5	52.3
	100.0	100.0	100.0

Table 2

VWPA's rate making capital structure ratios are reasonable based upon the above information.

EMBEDDED COST RATE

Q. What embedded cost rates do you recommend be used to calculate VWPA's overall rate of return?

A. Consistent with my recommended capital structure ratios I recommend using VUR's projected embedded debt cost rate of 4.60%, at October 31, 2025, for VWPA as reflected in Schedule 1. This embedded debt cost rate of 4.60% is detailed in the Company's Exhibit No. GRH-2 Schedule 1.2. The determination of an embedded cost rate is a relatively simple arithmetic exercise because a company has contracted for this capital for a specific period of time and at a specific cost, including issuance expenses and coupon rate.

The Company's projected embedded debt cost rate, at October 31, 2025, reflects a projected debt issuance in November 2024. The projected debt issuance in November 2024 reflects the same terms (e.g., coupon, net proceeds, etc.) as the Company's most recent debt issuance in November 2023.

FINANCIAL ANALYSIS

Q. Have you reviewed historical financial information of VWPA as part of your analysis?

A. Yes. On page 1 of Schedule 3, I developed a five-year analysis, ending in 2022, detailing various financial ratios for VWPA. On Schedule 4, I performed a similar five-year analysis for the Water Group. Schedule 5

reveals the results of operations for a large broad-based group of utilities known as the Standard & Poor's ("S&P") Utilities for the five years ending 2022. This information is useful in determining relative risk differences between different types of utilities.

Comparing VWPA, the Comparable Group and the S&P Utilities' coverage of fixed charges and the various cash flow coverage proves that the Comparable Group has experienced a lower level of coverage than the S&P Utilities. Reviewing VWPA's various cash flow coverages shows VWPA has had higher levels of coverage than the Comparable Group.

Q. What do you conclude from the comparison of all the information shown on Schedules 3 through 5?

A. Taken together, these comparisons show that VWPA is exposed to risk that is similar in nature but greater in degree compared with the Comparable Groups. This is evident in particular when one considers the size and diversification of VWPA, or lack thereof, as compared to the Comparable Companies. Moreover, the evidence from the various financial ratios shows VWPA's risks as being similar to the Comparable Companies' but less than the larger S&P Utilities. Prospectively, VWPA's future construction

expenditures will place downward pressure on VWPA's financial ratios as measured by interest coverage and cash generation.

Q. What information is shown on Schedule 6?

A. Schedule 6 lists the names, issuer credit ratings, common stock rankings, betas and market values of the companies contained in the Comparable Group and the S&P Utilities. As is evident from the information shown on Table 3, the Comparable Group and the S&P Utilities are similar to each other in risk.

	S&P Issuer Credit Rating	S&P Quality Ranking	Value Line Beta	Recent Market Value (Mill $)	Market Quartile Name
Water Group	A	High (A)	0.82	2,918.445	Mid-Cap
S&P Utilities	BBB+	Average (B+)	0.92	23,571.752	Large-Cap

Table 3

The Water Group's average issuer credit ratings and common stock rankings are higher than the S&P Utilities. The average beta of the Comparable Group, 0.82, is less than the average beta of the S&P Utilities, 0.92. Beta is a measure of volatility or market risk; the higher the beta, the higher the market risk. The market values provide an indication of the

relative size of each group. As a generalization, the smaller the average size of a group, the greater the risk.

Page 2 of Schedule 6 shows that VWPA has generally experienced the lowest return on equity ("ROE") when compared to the Comparable Companies. Further, VWPA's dividend payout ratio is lower than the Comparable Companies' dividend payout ratio.

S&P, the predominant bond rating agency, considers profit to be a fundamental determinant of credit protection. S&P states that a firm's profit level:

> Whether generated by the regulated or deregulated side of the business, profitability is critical for utilities because of the need to fund investment-generating capacity, maintain access to external debt and equity capital, and make acquisitions. Profit potential and stability is a critical determinant of credit protection. A company that generates higher operating margins and returns on capital also has a greater ability to fund growth internally, attract capital externally, and withstand business adversity. Earnings power ultimately attests to the value of the company's assets, as well. In fact, a company's profit performance offers a litmus test of its fundamental health and competitive position.
>
> Accordingly, the conclusions about profitability should confirm the assessment of business risk, including the degree of advantage provided by the regulatory environment.[8]

[8]Standard & Poor's Ratings Services, *Criteria, Utilities: Key Credit Factors: Business And Financial Risks In The Investor-Owned Utilities Industry*, Nov. 26, 2008, pps. 8-9.

Q. What information is shown on Schedule 7?

A. Schedule 7 reveals the capital intensity and capital recovery for VWPA, the Comparable Companies and the S&P Utilities. Based upon the 2022 capital intensity ratio of plant to revenues, VWPA ($8.16) is more capital intensive as compared to the Water Group ($6.63) and more than the S&P Utilities ($4.45). From a purely financial point of view, based on current accounting practices, the rate of capital recovery or depreciation rate is an indication of risk because it represents cash flow and the return of an investment. VWPA's average rate of capital recovery is lower than the Comparable Group's, suggesting more risk.

The return on equity and depreciation expense provides the margin for coverage of construction expenditures. For a utility company, depreciation expense is the single largest generator of cash flow. From a financial analyst's point of view, cash flow is the life blood of a utility company. Without it, a utility cannot access capital markets, it cannot construct plant, and therefore, it cannot provide service to its customers.

RISK ANALYSIS

Q. Please explain the information shown on Schedule 8.

A. Schedule 8 details the size difference between VWPA and the Comparable Group. Company size is an indicator of business risk and is summarized in Table 4.

Number of Times Larger Than VWPA	
	Water Group
Capitalization	18.6x
Revenues	20.3x
Number of Customers	14.6x

Table 4

As shown in Table 4, VWPA is smaller than the Water Group. The size of a company affects risk. A smaller company requires the employment of proportionately less financial leverage (*i.e.,* debt and preferred capital) than a larger company to balance out investment risk. If investment risk is not balanced out, then a higher cost of capital is required.

Q. Why is size significant to your analysis?

A. The size of a company can be likened to ships on the ocean, since a large ship has a much better chance of weathering a storm than a small ship. The loss of a large customer will impact a small company much more than a large company because a large customer of a small company usually accounts for a larger percentage of the small company's sales.

Moreover, a larger company is likely to have a more diverse geographic operation than a smaller company, which enables it to sustain earnings fluctuations caused by abnormal weather in one portion of its service territory. A larger company operating in more than one regulatory

jurisdiction enjoys "regulatory diversification" which makes it less susceptible to adverse regulatory developments or eminent domain claims in any single jurisdiction. Further, a larger company with a more diverse customer base is less susceptible to downturns associated with regional economic conditions than a small company. For example, on average, the average company in the Water Group provides water/sewer service in multiple states for about 963,400 customers. The average population of the communities served by the average company in the Water Group is about 3.5 million people. These wide-ranging operations provide the Water Group substantial geographic, economic, regulatory, weather and customer diversification. VWPA provides regulated water and wastewater service to about 66,000 customers (2022). The concentration of VWPA's business in east-central Pennsylvania makes it very susceptible to any adverse development in local regulatory, economic, demographic, competitive and weather conditions.

Further, S&P, a major credit rating agency, recognizes the importance that diversification and size play in credit ratings. S&P believes some of the critical factors include: regional and cross-border market diversification (mitigates economic, demographic, and political risk

concentration); customer diversification; and regulatory regime diversification.[9]

The size of a company can be a barrier to fluid access to capital markets (*i.e.,* liquidity risk). Investors require compensation for the lack of marketability and liquidity of their investments. If no compensation is provided, then investors, or at least sophisticated investors, shy away.

Q. Is the impact of size commonly recognized?

A. Yes, the National Association of Regulatory Utility Commissioners ("NARUC"), and the majority of acclaimed financial texts, recognize that size affects relative business risk. Liquidity risk and the existence of the small firm effect relating to business risk of small firms are well-documented in financial literature.[10] Investors' expectations reflect the highly-publicized existence of the small firm effect. For example, many mutual funds classify their investment strategy as small capitalization in an attempt to profit from the existence of the small firm effect.

As previously discussed, S&P recognizes that size plays a role in credit ratings.

> Standard & Poor's has no minimum size criterion for any given rating level. However, size turns out to be significantly correlated to ratings. The reason: size

[9]Standard & Poor's, Corporate Ratings Criteria, Utilities: Key Credit Factors: Business and Financial Risks in The Investor-Owned Utilities Industry, Nov. 26, 2008.

[10]Banz, Rolf, W. "The Relationship Between Return and Market Value of Common Stocks," Journal of Financial Economics, 9:3-18 1981. For subsequent studies see Fama and French, etc.

> often provides a measure of diversification, and/or affects competitive position. . . . Small companies are, almost by definition, more concentrated in terms of product, number of customers, or geography. In effect, they lack some elements of diversification that can benefit larger companies. To the extent that markets and regional economies change, a broader scope of business affords protection. This consideration is balanced against the performance and prospects of a given business. . . . In addition, lack of financial flexibility is usually an important negative factor in the case of very small companies. Adverse developments that would simply be a setback for companies with greater resources could spell the end for companies with limited access to funds.[11]

As shown on Schedule 9, size plays a role in the composition of investors, and hence liquidity. In 2022, about 123% of the Water Group's shares traded while the larger companies comprising the S&P Utilities had a much higher trading volume of 169%. Insiders[12] hold more than ten times more, as a percent to total, of the Water Group's shares than the S&P Utilities. Currently, only about 77% of the Water Group shares are held by institutions[13] while the larger companies comprising the S&P Utilities had much higher institutional holdings of 84%. Due to small size and less interest by financial institutions, fewer security analysts follow the Comparable Group and none follow VWPA.

[11] *Standard & Poor's*, Corporate Ratings Criteria 2006; p. 22.
[12] An insider is a director or an officer who has a policy-making role or a person who is directly or indirectly the beneficial owner of more than 10% of a certain company's stock.
[13] Institutional holders are those investment managers having a fair market value of equity assets under management of $100 million or more. Certain banks, insurance companies, investment advisers, investment companies, foundations and pension funds are included in this category.

The lack of trading activity may affect the cost of equity estimates for small entities such as VWPA and the Water Group. When stock prices do not change because of inactive trading activity, estimates of dividend yield for use in a dividend cash flow model and beta estimates for use in the capital asset pricing model are affected. In a stock market that is generally up, the beta estimates for the Comparable Companies may be understated due to thin trading.

Q. Do VWPA and the Comparable Companies have similar operating risks?

A. Yes. From an operations standpoint, VWPA and the Comparable Companies have similar risks and are indistinguishable. Both are required to meet Clean Water Act and Safe Drinking Water Act requirements and are also required to provide safe and reliable services to their customers and comply with Commission regulations.

Q. Is there any single measure that best shows investment risk from a common stockholder's perspective?

A. No. However, from a creditor's viewpoint, the best measure of investment risk is debt rating. The debt rating process generally provides a good measure of investment risk for common stockholders because the factors considered in the debt rating process are usually relevant factors that a

common stock investor would consider in assessing the risk of an investment. Credit rating agencies, such as S&P, assess the risk of an investment into two categories based on: fundamental business analysis; and financial analysis.[14] The business risk analysis includes assessing: Country risk; industry risk; competitive position; and profitability/peer group comparisons. The financial risk analysis includes assessing: accounting; financial governance and policies/risk tolerance; cash flow adequacy; capital structure/asset protection; and liquidity/short-term factors.

Q. What is the bond rating of VWPA and the Comparable Group?

A. Page 1 of Schedule 10 shows the average bond/credit rating Comparable Group. The Comparable Group has an A credit profile and VWPA does not have bonds rated. VUR has an A credit profile. The major bond rating/credit rating agencies append modifiers, such as +, - for S&P and 1, 2, and 3 for Moody's Investors Service ("Moody's") to each generic rating classification. For example, an "A" credit profile is comprised of three subsets such as A+, A, A- for S&P or A1, A2 or A3 for Moody's. The modifier of either "+" or "1" indicates that the obligation ranks in the higher end of its generic rating category; the modifier "2" indicates a mid-range ranking; and the modifier of "-" or "3" indicates a ranking in the lower end of that generic rating category.

[14] *Standard & Poor's*, Corporate Ratings Criteria, General: Criteria Methodology: Business Risk/Financial Risk Matrix Expanded, May 27, 2009 and *Standard & Poor's*, Criteria Corporates General: Corporate Methodology, November 19, 2013.

S&P and Moody's publish financial benchmark criteria necessary to obtain a bond rating for different types of utilities. As a generalization, the higher the perceived business risk, the more stringent the financial criteria so the sum of the two, business risk and financial criteria, remains the same.

Q. What are some financial benchmarks applied by credit rating agencies for rating public utility debt?

A. S&P describes its range of financial benchmarks as

> Risk-adjusted ratio guidelines depict the role that financial ratios play in Standard & Poor's rating process, since financial ratios are viewed in the context of a firm's business risk. A company with a stronger competitive position, more favorable business prospects, and more predictable cash flows can afford to undertake added financial risk while maintaining the same credit rating. The guidelines displayed in the matrices make explicit the linkage between financial ratios and levels of business risk.[15]

Q. What other information is shown on Schedule 10?

A. Page 2 of Schedule 10 summarizes the application of S&P's and Moody's measures of financial risk for VWPA and the Comparable Group. S&P's and Moody's measures of financial risk are broader than the traditional measure of financial risk (i.e., leverage). Besides reviewing amounts of leverage employed, S&P and Moody's also focus on earnings protection and cash flow adequacy.

[15]Standard & Poor's Corporate Rating Criteria, 2000.

As is evident from the information shown on page 2 of Schedule 10, for the five years ending in 2022 and for the year 2022, VWPA's cash flow adequacy ratios were generally higher than the Comparable Companies in most instances. Comparing the VWPA and the Water Group's measures of cash flow adequacy shows that the VWPA has experienced a higher level of cash flow adequacy than Water Group, indicating that VWPA is a lower investment risk than the Water Group. Prospectively, based upon the Company's construction program, the Company's ratios are likely to be strained. Based solely upon VWPA's historical ratios, it is my opinion that VWPA's credit profile is similar but higher to the Comparable Companies.

Further, based solely upon VWPA's size, it is my opinion that VWPA's credit profile is similar but lower than the Comparable Groups'. Based on VWPA's smaller size, it is highly likely that VWPA's credit profile is below BBB (i.e., BB), based solely upon size. An analysis of corporate credit ratings, shown on page 4 of Schedule 10, indicates that there is an 86% (100%-0%-1%-4%-9%=86%) chance that VWPA's credit profile falls below BBB based on its small size alone.[16] As S&P has stated, size is significantly correlated to credit ratings.

An analysis of corporate credit ratings, summarized on page 4 of Schedule 10, found The Berkshire Gas Company ("Berkshire") to be the

[16] Additionally, using VWPA's $295.336 million capitalization as a midpoint, I found only 15 companies which had capitalization of between $195.336 million to $395.336 million with a S&P bond or credit rating. Of these 15 companies, only 40% had bonds rated BBB or higher.

smallest utility with a credit rating. Berkshire's credit rating is only BBB+ despite having a capitalization comprised of about $204 million and a common equity ratio of 71%. According to this analysis of corporate credit ratings, the smallest rated water utility is The York Water Company ("York"). York's credit rating is only A- notwithstanding having a capitalization of about $347 million and a common equity ratio of 60%.

Q. Have you reviewed the Company's large construction program?

A. Yes, the Company estimates its construction program to total $223 million from 2023 through 2026. At year end 2022 the Company's total capital outstanding was $295 million indicating the need for a 76% increase ($223 million ÷ $295 million) in capital through 2026.

Q. How does the magnitude of the Company's large construction program compare to the Comparable Group's construction program?

A. The Company is forecasted to require 76% of additional capital to finance its construction program while the Comparable Group is projected by Value Line to require 46% of additional capital to finance their construction programs. Accordingly, VWPA's capital requirements are about 65% higher than the Comparable Group's construction programs through 2026 indicating greater risk for VWPA.

In order to compete with the Comparable Group for capital, in the future, it will be necessary for VWPA to achieve higher returns on equity, and increased cash flow just to maintain a similar credit quality.

S&P has stated:

> ... low authorized returns may affect the industry's ability to attract necessary capital to develop new water supplies and upgrade the quality of existing supplies . . . Traditional ratemaking policy has not provided sufficient credit support during the construction cycle of the electric industry over the past 15 years. To avoid a repeat in the water industry, regulators must be aware of the increased challenges the industry faces.[17]

Investors will not provide the equity capital necessary for increasing the amount of common equity in a capital structure unless the regulatory authority allows an adequate rate of return on the equity.[18]

Q. What do you conclude from the various measures of investment risk information you have testified to?

A. A summary of my conclusions regarding the risk analyses discussed previously is shown in Table 5. Overall, the information summarized in Table 5 indicates that VWPA has similar investment risk as the Water Group.

[17]Standard & Poor's CreditWeek, May 25, 1992 (emphasis added).
[18]National Association of Regulatory Utility Commissioners, loc. cit.

Summary of Risk Analyses

	VWPA	Water Group Followed by Analysts
1. Business Risk:		
2. Country Risk	Similar Risk Level	
3. Industry Risk	Similar Risk Level	
4. Competitive Position	Similar Risk Level	
5. Profitability/Peer Group Comparisons	Higher Risk Level	
6. Capitalization Ratios & Financial Risk (Leverage)*	Similar Risk Level	
7. Debt Cost Rate*	Similar Risk Level	
8. Relative Size:		
9. Regulatory Diversification	Higher Risk Level	
10. Economic Diversification	Higher Risk Level	
11. Demographic Diversification	Higher Risk Level	
12. Diversification of Weather Conditions	Higher Risk Level	
13. Customer Concentration of Revenues	Higher Risk Level	
14. Capital Intensity	Higher Risk Level	
15. Capital Recovery	Higher Risk Level	
16. Lower Liquidity:		
17. Institutional Holdings	Higher Risk Level	
18. Insider Holdings	Higher Risk Level	
19. Percentage of Shares Traded	Higher Risk Level	
20. Required To Meet Clean Water Acts and Safe Drinking Water Act	Similar Risk Level	
21. Credit Market Financial Risk Metrics		Higher Risk Level
22. Cash Flow Adequacy		Higher Risk Level
23. Credit Rating / Credit Profile	Similar Risk Level	

* - Based on recommended capital structure for rate making purposes.
Comment: The terms "Similar Level " indicates same amount of risk and the terms "Higher Level " indicates greater risk.

Table 5

CAPITAL COST RATES

Q. What information is shown on Schedule 11?

A. Schedule 11 reviews long-term and short-term interest rate trends. Long-term and short-term interest rate trends are reviewed to ascertain the "sub-flooring" or "basement" upon which the Comparable Companies' common equity market capitalization rate is built. Based upon the settled yields

implied in the Treasury Bond future contracts and the long-term and recent trends in spreads between long-term government bonds and A-rated public utility bonds available to me at the time Schedule 11 was prepared, I conclude that the market believes that if the Comparable Companies issued new long-term bonds near term, they would be priced to yield about 5.6% based upon a credit profile of "A." Further, it is reasonable to conclude the market anticipates that long-term government bonds will be priced to yield about 4.1%, near term.

Since October 2008, the Federal Reserve ("FED") has been monetizing US Treasury debt to artificially suppress interest rates through expansionary money policies (i.e., quantitative easing). The Federal Reserve, with effectively unlimited money at its disposal, intervenes at any time it wishes, in whatever volume it wishes, to make sure that Treasury bond and bill prices and yields are exactly what the Federal Reserve wants them to be. The U.S. Treasury bond market, and mortgage market, has become an artificial market with no connection to objective risk and interest rates.

In August 2011, the Federal Reserve began "Operation Twist." Under "Operation Twist," the Federal Reserve began buying $400 billion of long-dated or long-term US Treasury debt, financed by selling short-term US Treasury debt with three years to go or less. The goal of "Operation Twist" was to try to drive long-term rates lower, which the Federal Reserve

thought would help the mortgage market. This process has created an artificial demand for the US Treasury debt themselves, and easily drives interest rates artificially lower and deceives investors into believing U.S. Treasury debt is safe with wide demand. This has resulted in the entire capital system being impacted by the Federal Reserve's distortion of the price of risk.

> In the real world of economics, the borrower pays an interest rate to a lender, who makes money (interest) by taking on the risk of lending and deferring gratification. The lender is willing to not spend his money now. In a free market economy, interest rates are essentially a price put on money, and they reflect the time preference of people. Higher interest rates reflect a high demand for borrowing and lower savings. But the higher rates automatically correct this situation by encouraging savings and discouraging borrowing. Lower interest rates will work the opposite way. When the government/central bank tampers with interest rates, savings and lending are distorted, and resources are misallocated. This is evident in looking back on the housing bubble. The artificially low interest rates signaled that there was a high amount of savings. But it was a false signal. There was also a signal for people to borrow more. Again, it was a false signal. As these false signals were revealed, the housing boom turned into a bust.[19]

More recently, in response to COVID-19, the Federal Reserve provided monetary and fiscal stimulus to increase liquidity in the form of new fiscal stimulus programs and rate cuts. "For context, new fiscal stimulus and total fiscal deficits in the US are roughly double the levels seen in 2008-

[19]Pike, Geoffrey "The Threat of Negative Interest Rates," Wealth Daily, May 30, 2014, http://www.wealthdaily.com/articles/the-threat-of-negative-interest-rates/5185, (6/03/2014)

2009, and the US fiscal deficit we project for 2020 of 15%-18% is only matched by deficits seen at the height of WWII in 1942-1943."[20] The combined result of these actions by the Federal Reserve and investors' flight to quality resulted in artificial and historically low risk-free rates as measured by the 30-year treasury bond yield.

Q. What are some of the results from the FED's monetary and fiscal stimulus?

A. The FED's quantitative easing of expanding its own balance sheet, by buying bonds, and therefore injecting money into the economy, floods the economy with additional cash, keeping interest rates low and impacts equity markets. Additionally, the FED's uninterrupted and aggressive monetary expansion policy necessarily puts pressure on inflation. The FED's monetary and fiscal stimulus, which included artificial and historically low interest rates, have produced some of the highest inflation rates in the last 40 years according to CNBC.

> Inflation rose 9.1% in June, even more than expected, as consumer pressures intensify.
>
> Shoppers paid sharply higher prices for a variety of goods in June as inflation kept its hold on a slowing U.S. economy, the Bureau of Labor Statistics reported Wednesday.
>
> The consumer price index, a broad measure of everyday goods and services related to the cost of living, soared 9.1% from a year ago, above the 8.8% Dow Jones estimate. That

[20] https://www.jpmorgan.com/jpmpdf/1320748588999.pdf, (5/29/20).

marked the fastest pace for inflation going back to November 1981.[21]

In response to the recent level of inflation rates, the Federal Reserve announced its goal of increasing interest rates as high as needed to get inflation back to 2%.

> Americans are headed for a painful period of slow economic growth and possibly rising joblessness as the Federal Reserve raises interest rates to fight high inflation, U.S. central bank chief Jerome Powell warned on Friday in his bluntest language yet about what is in store for the world's biggest economy.
>
> In a speech kicking off the Jackson Hole central banking conference in Wyoming, Powell said the Fed will raise rates as high as needed to restrict growth, and would keep them there "for some time" to bring down inflation that is running at more than three times the Fed's 2% goal.
>
> "Reducing inflation is likely to require a sustained period of below-trend growth," Powell said. "While higher interest rates, slower growth, and softer labor market conditions will bring down inflation, they will also bring some pain to households and businesses. These are the unfortunate costs of reducing inflation. But a failure to restore price stability would mean far greater pain."
>
> As that pain increases, Powell said, people should not expect the Fed to dial back its monetary policy quickly until the inflation problem is fixed.[22]

[21] Cox, J. (2022, July 13). Inflation rose 9.1% in June, even more than expected, as consumer pressures intensify. *CNBC*. Retrieved from https://www.cnbc.com/2022/07/13/inflation-rose-9point1percent-in-june-even-more-than-expected-as-price-pressures-intensify.html, (7/13/22).
[22] Schneider, H and Saphir, A (2022, August 26). Powell sees pain ahead as Fed sticks to the fast lane to beat inflation. *REUTERS*. Retrieved from https://www.reuters.com/markets/us/feds-powell-pain-tight-policy-slow-growth-needed-for-some-time-beat-inflation-2022-08-26/, (8/27/22).

More recently the Chairman of the Federal Reserve reiterated its goal of increasing interest rates as high as needed to get inflation back to 2%.

> It is the Fed's job to bring inflation down to our 2 percent goal, and we will do so. **We have tightened policy significantly over the past year**. Although inflation has moved down from its peak—a welcome development—it remains too high. **We are prepared to raise rates further if appropriate**, and intend to hold policy at a restrictive level until we are confident that inflation is moving sustainably down toward our objective. . . .
>
> Restrictive monetary policy has tightened financial conditions, supporting the expectation of below-trend growth. **Since last year's symposium, the two-year real yield is up about 250 basis points, and longer-term real yields are higher as well—by nearly 150 basis points.** Beyond changes in interest rates, bank lending standards have tightened, and loan growth has slowed sharply. . . .
>
> But we are attentive to signs that the economy may not be cooling as expected. So far this year, GDP (gross domestic product) growth has come in above expectations and above its longer-run trend, and recent readings on consumer spending have been especially robust. In addition, after decelerating sharply over the past 18 months, the housing sector is showing signs of picking back up. Additional evidence of persistently above-trend growth could put further progress on inflation at risk and **could warrant further tightening of monetary policy**.[23]

Prospectively the capital markets will be affected by the upcoming unprecedented large Treasury financings coupled with increased interest rates. Investors provide capital based upon risk and return opportunities

[23] Jerome H. Powell, "Inflation: Progress and the Path Ahead" ("Structural Shifts in the Global Economy," an economic policy symposium sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming, August 25, 2023). *(Emphasis added and footnotes omitted*)

and investors will not provide common equity capital when higher risk-adjusted returns are available.

COMMON EQUITY COST RATE ESTIMATE

Q. What is the best method of estimating common equity cost rates?

A. There is no single method (model) suitable for estimating the cost rate for common equity. While a single investor may rely solely upon one model in evaluating investment opportunities, other investors rely on different models. Most sophisticated investors who use an equity valuation model rely on many models in evaluating their common equity investment alternatives. Therefore, the average price of an equity security reflects the results of the application of many equity models used by investors in determining their investment decisions.

The application of any single model to estimate common equity cost rates is not appropriate because the security price for which the equity cost rate is being estimated reflects the application of many models used in the valuation of the investment. That is, the price of any security reflects the collective application of many models. Accordingly, if only one model is used to estimate common equity cost rates, that cost rate will most likely be different from the collective market's cost rates because the collective valuation in the market reflects more than one method.

Noted financial texts, investor organizations and professional societies all endorse the use of more than one valuation method. "We endorse the dividend discount model, particularly when used for established companies with consistent earnings power and when used along with other valuation models. It is our view that, in any case, an investor should employ more than one model."[24]

The American Association of Individual Investors states, "No one area of investment is suitable for all investors and no single method of evaluating investment opportunities has been proven successful all of the time."[25]

In its study guide, the National Society of Rate of Return Analysts states, "No cost of equity model or other concept is recommended or emphasized, nor is any procedure for employing any model recommended . . . it remains important to recognize that alternative methods exist and have merit in cost of capital estimation. To this end, analysts should be knowledgeable of a broad spectrum of cost of capital techniques and issues."[26]

Several different models should be employed to measure accurately the market-required cost of equity reflected in the price of stock. Therefore,

[24]Sidney Cottle, Roger F. Murray and Frank E. Block, Graham and Dodd's Securities Analysis 5th Edition, McGraw-Hill, Inc., 1988, p. 568 (emphasis added).
[25]Editorial Policy, AAII Journal, American Association of Individual Investors, Volume 18, No. 1, January 1996, p. 1.
[26]David C. Parcell, The Cost of Capital - A Practitioners Guide, National Society of Rate of Return Analysts, 1995 Edition.

I used three recognized methods: the DCF shown on Schedule 12, the CAPM shown on Schedule 17, and the RP shown on Schedule 18.

DISCOUNTED CASH FLOW

Q. Please explain the discounted cash flow model.

A. The DCF is based upon the assumption that the price of a share of stock is equal to a future stream of cash flows to which the holder is entitled. The stream of cash flows is discounted at the investor-required cost rate (cost of capital).

Although the traditional DCF assumes a stream of cash flow into perpetuity, a termination, or sale price can be calculated at any point in time. Therefore, the return rate to the stockholder consists of cash flow (earnings or dividends) received and the change in the price of a share of stock. The cost of equity is defined as:

> ...the minimum rate of return that must be earned on equity finance and investments to keep the value of existing common equity unchanged. This return rate is the rate of return that investors expect to receive on the Company's common stock . . . the dividend yield plus the capital gains yield . . . [27]

[27] J. Fred Weston and Eugene F. Brigham, Essentials of Managerial Finance, 3rd ed. (The Dryden Press), 1974, p. 504 (emphasis added).

Q. Please explain how you calculated your dividend yield in the DCF shown on Schedule 12.

A. As shown on page 1 of Schedule 12, I used the average dividend yield of 2.3% for the Water Group. The individual dividend yields are shown on page 2 of Schedule 12 and are based upon the most recent months' yield, November 2023, and the twelve-month average yield, ending November 2023. The second input to a market DCF calculation is the determination of an appropriate share price growth rate.

Q. What sources of growth rates did you review?

A. I reviewed both historical and projected growth rates. Schedule 13 shows the array of projected growth rates for the Comparable Companies that are published. Specific historical growth rates are shown for informational purposes because I believe the meaningful historical growth rates are already considered when analysts arrive at their projected growth rates. Nonetheless, some investors may still rely on historical growth rates.

Q. Please explain the sources of the projected growth rates shown on Schedule 13.

A. I relied upon four sources for projected growth rates, First Call, S&P, Zacks Investment Research and Value Line.

Q. Did you review any other growth rates besides those shown on Schedule 13?

A. Yes. I reviewed EPS growth rates reflecting changes in return rates on book common equity (ROE) over time. I summarized recent ROEs on page 1 of Schedule 14 and compared those to the Water Group's higher levels projected to be achieved by Value Line, as shown on page 2 of Schedule 14. ROEs increase when EPS grows at much higher/faster rates than book value.

I also reviewed industry specific average projected growth rates that are published by Zacks for the industries in which the Comparable Companies operate. According to Zacks, the Water Group's industry is projected to have EPS growth rates that average 10.5% over the next five years.

Q. What do you conclude from the growth rates you have reviewed?

A. Table 6 summarizes some of the various growth rates reviewed.

Summary of Growth Rates

	Water Group
Projected 5 Year Growth in EPS	6.3
Actual 5 Year Growth in EPS	5.8
Projected 5 Year Growth in DPS	7.2
Projected 5 Year Growth in EPS for the industry	10.5

Table 6

Academic studies suggest that growth rate conclusions should be tested for reasonableness against long-term interest rate levels. Further, the minimum growth rate must at least exceed expected inflation levels. Otherwise, investors would experience decreases in the purchasing power of their investment. Finally, the combined result of adding the growth rate to the market value dividend yield must provide a sufficient margin over yields of public utility debt.

Q. What method did you use to arrive at your growth rate conclusion?

A. No single method is necessarily the correct method of estimating share value growth. It is reasonable to assume that investors anticipate that the Water Group's current ROE will expand to higher levels. The published historical earnings growth rates for the Water Group averages 5.8%. Because there is not necessarily any single means of estimating share value growth, I considered all of this information in determining a growth rate conclusion for the Comparable Companies.

Moreover, while some rate of return practitioners would advocate that mathematical precision should be followed when selecting a growth rate, the fact is that investors do not behave in the same manner when establishing the market price for a stock. Rather, investors consider both company-specific variables and overall market sentiment such as inflation rates, interest rates and economic conditions when formulating their capital

gains expectations. This is especially true when one considers the relatively meaningless negative growth rates. That is, use of a negative growth rate in a DCF implies that investors invest with the expectation of losing money.

The range of growth rates previously summarized supports the reasonableness of an expected 6.3% growth rate for the Water Group based primarily on the projected five-year growth rates and considering the Water Group's industry projected EPS growth rates of 10.5%. Like the projected growth rates, this investor-expected growth rate of 6.3% is based on a survey of projected and historical growth rates published by established entities, including First Call, S&P, Zacks Investment Research and Value Line. Use of information from these unbiased professional organizations provides an objective estimation of investor's expectations of growth. Based on the aforesaid, all growth rates for the Comparison Companies have been considered and have been given weight in determining a 6.3% growth rate for the Water Group.

Q. What is your market value DCF estimate for the Comparable Companies?

A. The market value DCF cost rate estimate for the Water Group is 8.7%, as detailed on page 1 of Schedule 12.

Q. Are there other considerations that should be taken into account in reviewing a market value capitalization DCF cost rate estimate?

A. Yes. It should be noted that although I recommend specific dividend yields for the Comparable Group, I recommend that less weight be given to the resultant market value DCF cost rate due to the market's current market capitalization ratios and the impact that the market-to-book ratio has on the DCF results.[28] The Comparable Companies' current market-to-book ratios of 287% and low dividend yields are being affected by the aforementioned policy of the Federal Reserve that has resulted in the mispricing of capital due to artificial interest rates, not DCF fundamentals.

Although the DCF cost for common equity appears to be based upon mathematical precision, the derived result does not reflect the reality of the marketplace since the model proceeds from unconnected assumptions. The traditional DCF derived cost rate for common equity will continuously understate or overstate investors' return requirements as long as stock prices continually sell above or below book value. A traditional DCF model implicitly assumes that stock price will be driven to book value over time. However, such a proposition is not rational when viewed in the context of an investor purchasing stock above book value. It is <u>not</u> rational to assume

[28] The impact of the market's current market capitalization ratios on the resultant market value DCF cost rate is especially evidenced when the DCF result for individual companies in the Comparable Group is considered. For example, the resultant market value DCF cost rate for one of the individual companies in the Comparable Group is <u>below its current long-term debt cost</u> rate while a second company's cost is only slightly above.

that an investor would expect share price to decrease 60% (100%÷249%=40%-100%=60%) in value to equal book value.

Utility stocks do not trade in a vacuum. Utility stock prices, whether they are above or below book value, reflect worldwide market sentiment and are not reflective of only one element.

Q. What do you mean by your statement that utility stocks are not traded in a vacuum?

A. Utility stocks cannot be viewed solely by themselves. They must be viewed in the context of the market environment. Table 7 summarizes recent market-to-book ratios ("M/B") for well-known measures of market value reported in the December 18, 2023 issue of Barron's and the Water Group's average M/B as shown on page 1 of Schedule 14.

	M/B Ratios(%)
Dow Jones Industrials	487
Dow Jones Transportation	456
Dow Jones Utilities	196
S&P 500	461
S&P Industrials	616
Vs.	
Water Group	249

Table 7

Utility stock investors view their investment decisions compared with other investment alternatives, including those of the various market measures shown in Table 7.

Q. How does a traditional DCF implicitly assume that market price will equal book value?

A. Under traditional DCF theory, price will equal book value (M/B=1.00) only when a company is earning its cost of capital. Traditional DCF theory maintains that a company is under-earning its cost of capital when the market price is below book value (M/B<1.00), while a company over-earning its cost of capital will have a market price above its book value (M/B>1.00). If this were true, it would imply that the capitalistic free-market is not efficient because the overwhelming majority of stocks would currently be earning more than their cost of capital. Table 7 shows that most stocks sell at an M/B that is greater than 1.0.

Q. Please explain why such a phenomenon would show that the capitalistic free-market is not efficient.

A. Historically, the S&P 500, which represented the largest 500 companies listed on exchanges in the United States, have not sold at an M/B of 1.0 during the last 24-years, 1999-2022. Based upon the traditional DCF assumption, which suggests that companies with M/Bs greater than 1.0

earn more than their cost of capital, this data would suggest that the S&P 500 companies have earned more than their cost of capital while competing in a competitive environment over the 24-year period. In a competitive market, new companies would continually enter the market up to the point that the earnings rate was at least equal to their cost of capital.

During this period the S&P 500 sold at an average M/B of 306% while experiencing a ROE of 18.0% over a period in which interest rates averaged 3.9%. It is important to note that during this period the S&P 500 M/B ranged from 192% to 490%, all while competing in competitive markets.

Q. What is the significance of S&P 500 M/B and the cost of capital for a water utility?

A. As stated previously, utility stocks do not trade in a vacuum. They must compete for capital with other firms including the S&P 500 stocks. Over time, there has been a relationship between M/Bs of S&P 500 stocks and utility stocks. Although S&P 500 stocks have generally sold at a higher multiple of book value than utility stocks, both have tracked in similar directions. Because utility and S&P 500 stock prices relative to book values move in similar directions, it is irrational to conclude that stock prices that are different from book value, either higher or lower, suggests that a firm is over-or under-earning its cost of capital when competitive, free-markets exist.

Q. Does the market value DCF provide a reasonable estimate of the Water Group's common equity cost rate?

A. No, the DCF only provides a reasonable estimate of the Comparable Group's common equity cost rate when their market price and book value are similar (M/B=100%).[29] A DCF will overstate a common equity cost rate when M/Bs are below 100% and understate when they are above 100%. Since the Comparable Group's current M/Bs average 287%, the DCF understates their common equity cost rate. Schedule 15 provides a numerical illustration of the impact of M/Bs on investors' market returns and DCF returns. The reason that DCF understates or overstates investors' return requirements depending upon M/B levels is because a DCF-derived equity cost rate is applied to a book value rate base while investors' returns are measured relative to stock price levels. Based upon this, I recommend that less weight be given to the market value DCF cost rate unless the increased financial risk, resulting from applying a market value cost rate to a book value, is accounted for.

[29]Roger A Morin, Regulatory Finance - Utilities' Cost of Capital, Public Utility Reports, Inc., 1994, pp. 236-237.

Q. How do you resolve the financial risk difference between market value cost rates and book value cost rates?

A. The basic proposition of financial theory regarding the economic value of a company is based on market value. That is, a company's value is based on its **market value** weighted average cost of capital.[30] The American Society of Appraisers, ASA Business Valuation Standards, 2009, and the National Association of Certified Valuation Analysts, Professional Standards, 2007, use the same definition:

> Weighted Average Cost of Capital (WACC). The cost of capital (discount rate) determined by the weighted average, **at market values**, of the cost of all financing sources in the business enterprise's capital structure. (Emphasis added)

Accordingly, the market value derived cost rate reflects the financial risk or leverage associated with **capitalization ratios based on market value**, not book value.

As shown on page 1 of Schedule 16, for the Water Group there is a large difference in leverage as a result of the average $3.683 **billion** difference in market value common equity and book value common equity. This difference in market values and book values results in debt/equity ratios based on market value of 30.3%/69.7% (debt/equity) versus

[30]For other examples, see http://www.investinganswers.com/financial-dictionary/financial-statement-analysis/weighted-average-cost-capital-wacc-2905. Also see http://www.wallstreetmojo.com/weighted-average-cost-capital-wacc/ , or http://accountingexplained.com/misc/corporate-finance/wacc .

50.4%/49.6% (debt/equity) based on book value as shown on page 1 of Schedule 16. The larger the difference between market values and book values the less reliable the models' results are because **the models provide an estimate of the cost of capital of market value**, not book value.

Financial theory concludes that capital structure and firm value are related. Since capital structure and firm value are related, an adjustment is required when a cost of common equity model is based on market value and if its results are then applied to book value. As explained previously, the market value derived cost rate reflects the financial risk or leverage associated with **capitalization ratios based on market value**, not book value. The authors Brealey, Myers and Allen provide a similar definition of the cost of capital being based on market capitalization, not book value,

> The values of debt and equity add up to overall firm value (D + E = V) and firm value V equals asset value. **These figures are all market values, not book (accounting) values**. The market value of equity is often much larger than the book value, so the market debt ratio D/V is often much lower than a debt ratio computed from the book balance sheet.[31]

The work of Modigliani and Miller concludes that the market value of any firm is independent of its capital structure and this is precisely the reason why an adjustment is appropriate. The only way for the market value of a firm to remain independent of its capital structure is if the capital cost

[31]Brealey, Myers and Allen, Principles of Corporate Finance, 10th edition, page 216 (emphasis added).

rates change to offset changes in the capital structure. If the capital cost rates do not change to offset changes in the capital structure, then the value of the firm will change. Clearly an adjustment is required when a cost of common equity model is based on **market value** and if its results are then applied to **book value** because the capital structure is changed from **market value** capitalization to **book value** capitalization.

Differences in the amount of leverage employed can be quantified based upon the Comparable Group's leveraged beta being "unleveraged" through the application of the "Hamada Model."

> The Hamada equation is a fundamental analysis method of analyzing a firm's cost of capital as it uses additional financial leverage, and how that relates to the overall riskiness of the firm. The measure is used to summarize the effects this type of leverage has on a firm's cost of capital—over and above the cost of capital as if the firm had no debt.[32]

The Hamada Model combines two financial theorems: the Modigliani-Miller Theorem and the CAPM.[33] On page 2 of Schedule 16 I used two Hamada Models including the original Hamada formula and the Harris-Pringle formula to account for the 20.2 percentage point (69.7% - 49.5% = 20.2%) change in common equity ratio that results from changing from market value capitalization to book value capitalization. The results of the application of the original Hamada formula and the Harris-Pringle formula determine a

[32] Hargrave, Marshall. "Hamada Equation Definition, Formula, Example," *Investopedia*. Accessed 3/14/23. https://www.investopedia.com/terms/h/hamadaequation.asp.
[33] "Hamada's Equation," Corporate Finance Institute. Accessed 3/14/23. https://corporatefinanceinstitute.com/resources/valuation/hamadas-equation/.

range of adjustment of 0.73% to 1.15%, and average 0.94%. The details of the application of the two Hamada models are shown on page 2 of Schedule 16.

For example, the inputs to the original Hamada formula for the Water Group market value capitalization consist of their raw leveraged beta of 0.7, debt ratio of 30.3%, preferred stock ratio of 0.0%, common equity ratio of 69.7% and combined tax rate of 26.14%. The group's unleveraged beta is determined to be 0.53 through the use of the following original Hamada formula:

$$Bl = Bu\ (1 + (1 - t)\ D/E + P/E)$$

where:

Bl = observed, leveraged beta
Bu = calculated, unleveraged beta
t = income tax rate
D = debt ratio
P = preferred stock ratio
E = common equity ratio

Applying the unleveraged beta of 0.53 along with the Water Group's book value capitalization ratios of 50.4% long-term debt, 0.1% preferred stock and 49.5% common equity and combined tax rate of 26.14% results in a leveraged beta of 0.93 applicable to the group's book value capitalization. Based upon the Water Group's risk premium of 5.0% and the difference between Water Group's market value leveraged beta, their book value leveraged beta of 0.23 (0.93 - 0.70) indicates that the Water Group's

common equity cost rate must be increased by 1.15 (0.23 x 5.0 = 1.15) in recognition of their book value's exposure to more financial risk.

The inputs to the Harris-Pringle formula for the Water Group market value capitalization consist of their raw leveraged beta of 0.7, debt ratio of 30.3%, preferred stock ratio of 0.0%, common equity ratio of 69.7% and debt beta of 0.34. The group's unleveraged beta is determined to be 0.59 through the use of the following Harris-Pringle formula:

$$Bl = Bu + (Bu - Bd)(D/E)$$

where:

Bl = observed, leveraged beta
Bu = calculated, unleveraged beta
Bd = debt beta
D = debt ratio
P = preferred stock ratio
E = common equity ratio

Applying the unleveraged beta of 0.59 along with the Water Group's book value capitalization ratios of 50.4% long-term debt, 0.1% preferred stock and 49.5% common equity and debt beta of 0.34 results in a leveraged beta of 0.85 applicable to the group's book value capitalization. Based upon the Water Group's risk premium of 5.0% and the difference between Water Group's market value leveraged beta, their book value leveraged beta of 0.15 (0.85 - 0.70) indicates that the Water Group's common equity cost rate must be increased by 0.73 (0.15 x 5.0 = 0.73) in recognition of their book value's exposure to more financial risk.

Q. Is there another way to reflect the financial risk difference that exists as a result of market capitalization ratios being significantly different from book value capitalization ratios?

A. Yes, generally speaking. Although it is possible to know the direction of a financial risk adjustment on common equity cost rate, a specific quantification of financial risk differences is very difficult. Although the end result of a financial risk adjustment is very subjective and specific quantification very difficult, the direction of the adjustment is clearly known. However, hypothetically if the Comparable Group's debt were rated based on market value debt ratios they would command an Aaa rating. The Comparison Group currently has bonds rated A based upon their book value debt ratios. The yield spread on a bond rated Aaa versus A rated bonds averages about 54 basis points or 0.54% as shown on page 3 of Schedule 16.

The end result of the application of the Hamada Model and the bond yield spread indicates that the Water Group market value common equity cost rate equity cost rate should be adjusted upward by at least 0.75% (0.94% hamada est. + 0.54% yield spread = 1.48% ÷ 2 = 0.74%) since it is going to be applied to a book value.

Accounting for the increased amount of leverage between market value derived DCF cost rates and book value cost rates indicates a book value DCF cost rate of 9.45% for the Water Group (8.7% + 0.75% = 9.45%).

CAPITAL ASSET PRICING MODEL

Q. Please briefly describe the theory of the capital asset pricing model.

A. The CAPM is based upon the assumption that investors hold diversified portfolios and that the market only recognizes or rewards non-diversifiable (or systematic) risk when determining the price of a security because company-specific risk (or non-systematic) is removed through diversification. Further, investors are assumed to require additional or higher returns for assuming additional or higher risk. This assumption is captured by using a beta that provides an incremental cost of additional risk above the base risk-free rate available to investors. The beta of a security reflects the market risk or systematic risk of the security relative to the market. The beta for the market is always equal to 1.00; therefore, a company whose stock has a beta greater than 1.00 is considered riskier than the market, and a company with a beta less than 1.00 is considered less risky than the market. The base risk-free rate is assumed to be a U.S. Government treasury security because they are assumed to be free of default risk.

Q. What risk-free rate and beta have you used in your CAPM calculation?

A. The risk-free rate used in CAPM should have approximately the same maturity as the life of the asset for which the cost rate is being determined. Because utility assets are long-lived, a long-term Treasury Bond yield

serves as an appropriate proxy. Previously, I estimated an appropriate risk-free rate of 4.1% based upon the recent and forward long-term Treasury yields. I used the average beta of 0.82 for the Water Group as shown on page 1 of Schedule 17. However, as stated previously, the Comparable Group's betas are understated due to their small size which affects their stock price changes.

Q. After developing an appropriate beta and risk-free rate, what else is necessary to calculate a CAPM derived cost rate?

A. A market premium is necessary to determine a traditional CAPM derived cost rate. The market return rate is the return expected for the entire market. The market premium is then multiplied by the company specific beta to capture the incremental cost of additional risk (market premium) above the base risk-free rate (long-term treasury securities) to develop a risk adjusted market premium. For example, if you conclude that the expected return on the market as a whole is 15% and further assume that the risk-free rate is 8%, then the market premium is shown to be 7% (15% - 8% = 7%).

Further, assume there are two companies, one of which is considered less risky than the market, and therefore has a beta of less than 1.00 or 0.80. The second company has a beta that is greater than 1.00 or 1.20, and is therefore considered riskier than the market. By multiplying the

hypothetical 7.0% market premium by the respective betas of 0.80 and 1.20, risk adjusted market premiums of 5.6% (7.0% x 0.80) and 8.4% (7.0% x 1.20) are shown for the company considered less risky than the market and for the company considered riskier than the market, respectively.

Adding the assumed risk-free rate of 8% to the risk adjusted market premiums results in the CAPM derived cost rates of 13.6% (5.6% + 8.0%) for the less risky company and 16.4% (8.4% + 8.0%) for the company considered of greater risk than the market. In fact, the result of this hypothetical CAPM calculation shows that: (1) the least risky company, with the beta of 0.80, has a cost rate of 13.6%; (2) the market, with the beta of 1.00, has a cost rate of 15.0%; and (3) that the higher risk company, with a beta of 1.20, has a cost rate of 16.4%.

Q. How did you develop a market premium for your CAPM?

A. The average projected market premium of 10.72% is developed on page 2 of Schedule 17. It is based upon Value Line's average projected total market return for the next three to five years of 15.70% less the risk free rate of 4.1% and the S&P 500's average projected total market return for the next three to five years of 13.94% less the risk free rate of 4.1% from S&P Global Market Intelligence. I also reviewed market premiums derived from Ibbotson Associates' most recent publication concerning asset returns that show a market premium of 7.5%. The Ibbotson Associates' market

premium may be on the low side reflective of the higher interest rate environment found during their study (*i.e.,* 5.0%). The Value Line market premium reflects the Federal Reserve's current artificial interest rate levels while the Ibbotson Associates' market premiums reflect a higher interest rate environment.

Q. How did you adjust for the impact that size has on the Comparable Group's beta?

A. The adjustment is reflected in the CAPM size premium. The CAPM size premium is developed on page 4 of Schedule 17. The size premium reflects the risks associated with the Comparable Group's small size and its impact on the determination of their beta. This adjustment is necessary because beta (systematic risk) does not capture or reflect the Comparable Group's small size. I reduced the size premium by the ratio of the Comparison Group's beta to their respective market quartile's beta and estimated credit spreads for the comparison companies and the quartile companies.

Q. What is the comparison group's market cost of equity based upon your CAPM calculation?

A. The CAPM based on Ibbotson Associates' historical market returns shows a market cost rate of 11.0% for the Water Group. The CAPM based on projected market returns shows a 13.6% for the Water Group, as shown on

page 1 of Schedule 17. The Comparable Group's market value CAPM of 11.0% is based 100% on the results of the historical market returns and 0% on the projected market returns. Adjusting the market value CAPM based upon the end result of the application of the Hamada Model and the bond yield spread to account for the difference in leverage between market value capitalization ratios and book value ratios discussed previously indicates a cost rate of 11.75% for the Water Group applicable to book value (11.0% + 0.75% = 11.75%).

RISK PREMIUM

Q. What is a risk premium?

A. A risk premium is the common equity investors' required premium over the long-term debt cost rate for the same company, in recognition of the added risk to which the common stockholder is exposed versus long-term debtholders. Long-term debtholders have a stated contract concerning the receipt of dividend and principal repayment whereas common stock investors do not. Further, long-term debtholders have the first claim on assets in case of bankruptcy. A risk premium recognizes the higher risk to which a common stock investor is exposed. The risk premium-derived cost rate for common equity is the simplest form of deriving the cost rate for common equity because it is nothing more than a premium above the prospective level of long-term corporate debt.

Q. What is the appropriate estimated future long-term borrowing rate for the Comparable Companies?

A. The estimated near term long-term borrowing rate for the Comparable Companies is 5.6% based upon their credit profile that supports an A bond rating

Q. What is the appropriate risk premium to be added to the future long-term borrowing rate?

A. To determine a common equity cost rate, it is necessary to estimate a risk premium to be added to the Comparable Group's prospective long-term debt rate. Investors may rely upon published projected premiums; they also rely upon their experiences of investing in ultimately determining a probabilistic forecasted risk premium.

Projections of total market returns of 14.82% are shown on page 9 of Schedule 18. A projected risk premium for the market can be derived by subtracting the debt cost rate from the projected market return as shown on page 9 of Schedule 18. However, the derived risk premium for the market is not directly applicable to the Comparable Companies because they are less risky than the market. The use of 90% of the market's risk is a conservative estimation of their level of risk as compared to the market. Based on this, a reasonable estimate of a longer term projected risk premium is 8.2% as shown on page 9 of Schedule 18.

Q. How do investors' experiences affect their determination of a risk premium?

A. Returns on various assets are studied to determine a probabilistic risk premium. The most noted asset return studies and resultant risk premium studies are those performed by Ibbotson Associates. However, Ibbotson Associates has not performed asset return studies concerning public utility common stocks. Based upon Ibbotson Associates' methodology of computing asset returns, I calculated annual returns for the S&P utilities and bonds for the period 1928-2022. The resultant annual returns were then compared to determine a recent risk premium from a recent 20-year period, 2003-2022 and subsequent periods that were each increased by ten years until the entire study period was reviewed (pages 2 and 3 of Schedule 18).

A long-term analysis of rates of return is necessary because it assumes that investors' expectations are, on average, equal to realized long-run rates of return and resultant risk premium. Observing a single year's risk premium, either high or low, may not be consistent with investors' requirements. Further, studies show a mean reversion in risk premiums. In other words, over time, risk premiums revert to a longer-term average premium. Moreover, since the expected rate of return is defined as "the rate of return expected to be realized from an investment; the mean value

of the probability distribution of possible results,"[34] a long-term analysis of annual returns is appropriate.

Q. What do you conclude from the information shown on pages 2 and 3 of Schedule 18?

A. The average of the absolute range of the S&P Utilities' appropriate average risk premium (i.e., bonds rated AAA to A) was 4.9% during the seven periods studied, as calculated from page 2 of Schedule 18. The credit adjusted longer term risk premiums (i.e., bonds rated A), 1928-2022, averages 4.6%. The appropriate average (i.e., bonds rated AAA to A) longer term risk premiums, 1928-2022, have an absolute range of 4.6% to 5.2%, and averages 4.8%.

The aforementioned premiums are based on total returns for bonds; and reflect their price risk. A bond's price risk is not related to its credit quality and is eliminated when a bond is held to maturity from time of purchase. Using the income returns, page 4 of Schedule 18, for bonds eliminates price risk and better measures an investor's required return based on credit quality. The appropriate average risk premium (i.e., bonds rated AAA to A) based on income returns was 5.7% during the seven periods studied. The credit adjusted longer term risk premiums (i.e., bonds

[34]Eugene F. Brigham, Fundamentals of Financial Management, Fifth Edition, The Dryden Press, 1989, p. 106.

rated A), 1928-2022, averages 4.9%. The appropriate average (i.e., bonds rated AAA to A) longer term risk premiums, 1928-2022, have an absolute range of 4.9% to 5.2%, and averages 5.1%.

Q. What information is shown on page 4 of Schedule 18?

A. Page 4 of Schedule 18 proves and measures the negative relationship between interest rate levels and the resulting risk premium. That is, risk premiums are generally higher when interest rates are low and risk premiums are generally lower when interest rates are high. This was proven by sorting the 95-year period, 1928 to 2022, annual returns based on interest rate level from lowest interest rate to highest interest rate and distributing the results into two groups, a 47-year low interest rate environment group and a 48-year high interest rate environment group.

During the period 1928-2022, the 47 years with the lowest interest rates had an average interest rate of 2.8% and reflected a range of interest rates from 1.4% to 4.0%. This period resembles the current interest rate environment of 4.1% discussed previously regarding the CAPM's risk free rate. The risk premium based on total returns during this low interest rate environment produced the appropriate average (i.e., bonds rated AAA to A) longer term risk premium of 6.9% and a credit adjusted longer term risk premium (i.e., bonds rated A) of 6.3%. The annual income return based risk premium during this low interest rate environment produced the

appropriate average (i.e., bonds rated AAA to A) longer term risk premium of 7.5% and a credit adjusted longer term risk premium (i.e., bonds rated A) of 7.2%.

However, during the period 1928-2022, the 48 years with the highest interest rates had an average interest rate of 7.1% and reflected a range of interest rates from 4.1% to 13.5%. This period is far different from the current interest rate environment of 4.1%. The risk premium based on total returns during the highest interest rate environment produced an average longer term risk premium of 2.9% over bonds rated AAA to A and a credit adjusted longer term risk premium (i.e., bonds rated A) of only 2.9%. The annual income return based risk premium during the highest interest rate environment produced an average longer term risk premium of 2.8% over bonds rated AAA to A and a credit adjusted longer term risk premium (i.e., bonds rated A) of only 2.7%.

Over time, risk premiums are mean reverting. They constantly move toward a long-term average reflecting a long-term level of interest rates. That is, an above-average risk premium will decrease toward a long-term average while a below-average risk premium will increase toward a long-term average. In any single year, of course, investor-required rates of return may not be realized and in certain instances, a single year's risk premiums may be negative. Negative risk premiums are not indicative of investors' expectations and violate the basic premise of finance concerning risk and

return. Negative risk premiums usually occur only in the stock market's down years (*i.e.,* the years in which the stock markets' return was negative).

When interest rate levels are not considered the credit adjusted longer term risk premium (i.e., bonds rated A), 1928-2022, averages 4.9%, discussed previously regarding page 4 of Schedule 18. However, the annual income return based risk premium during the low interest rate environment produced a credit adjusted longer term risk premium (i.e., bonds rated A) of 7.2%. Since this period resembles the current interest rate environment of 4.1%, a reasonable estimate of investors risk premium based on historical returns is based on a 50% weighting on the results of the entire 1928-2022 historical market returns and a 50% weighting on the results of the low interest rate environment to produce a 6.0% historical risk premium. However, I recognize that the current interest rate environment of 4.1% is close to the upper end of the low interest rate environment, which ranged from 1.4% to 4.0%, and have lowered my estimate of the risk premium to 5.0%.

Adding the risk premium of 5.0% for the Comparable Group to the prospective cost of newly-issued long-term debt of 5.6% results in a market value risk premium derived cost rate for common equity of 10.6% as reflected on page 1 of Schedule 18. Adjusting the market value risk premium based upon the end result of the application of the Hamada Model and the bond yield spread to account for the difference in leverage between

market value capitalization and book value ratios discussed previously indicates a cost rate of 11.35% applicable to book value (10.6% + 0.75% = 11.35%).

SUMMARY OF COMMON EQUITY COST RATE

Q. What is your Comparable Group's common equity cost rate?

A. Based upon the results of the models employed, the Water Group's common equity cost rate is in the range of 9.45% to 11.75% as reflected on Schedule 19. Based upon this data, the common equity cost rate for the Water Group is at least 10.80%. My recommendation is based upon the Water Group's 10.80% common equity cost rate.

Q. Do you recommend a cost of common equity of 10.80% for VWPA?

A. Yes. Based upon the financial analysis and risk analysis, I conclude that VWPA is exposed to overall similar investment risk as the Comparable Group. This is evidenced by the factors summarized in Table 5 discussed previously.

The results of the three models employed for the Water Group show a current range of common equity cost applicable to book value of VWPA of 9.45% (DCF), 11.75% (CAPM), and 11.35% (RP) as shown in Table 8.

Summary of the VWPA's Equity Cost Rates	
DCF	9.45
CAPM	11.75
RP	11.35

Table 8

Q. What is your common equity cost rate recommendation for VWPA?

A. As discussed above and as shown in Schedule 19, I recommend a 10.80% common equity cost rate for VWPA.

Q. Have you checked the reasonableness of your recommended common equity rate for VWPA?

A. Yes. Page 2 of Schedule 14 reflects the average projected earned return on average book common equity for the companies in the Comparable Group for the period 2026-2028, which is shown to average 10.7% and have median of 10.3%. Given the large degree to which regulatory lag and attrition impacts water utilities' earning, the range of the comparable utilities' projected earned returns suggests that my recommendation that VWPA be permitted an opportunity to earn 10.80% is reasonable, if not conservative.

OVERALL RATE OF RETURN RECOMMENDATION

Q. What is your overall fair rate of return recommendation for the VWPA?

A. Based upon the recommended capital structure and my estimate of the VWPA's common equity cost rate, I recommend an overall fair rate of return of 7.95%.[35] The details of my recommendation are shown on Schedule 1.

Q. Have you tested the reasonableness of your overall fair rate of return recommendation?

A. Yes. If my recommended overall rate of return is actually earned, it will give VWPA ratios that will allow VWPA to present a financial profile that will enable it to attract capital necessary to provide safe and reliable water service, at reasonable terms.

Q. Does that conclude your direct testimony concerning rate of return?

A. Yes, it does.

[35] It should be noted that my current analysis contained in Exhibit HW-1 supports a cost of common equity of 10.80% for the Company. The Company's filing includes an overall rate of return of 7.95% and a 10.80% of common equity for filing purposes to minimize the requested revenue increase.

PRINCIPLES OF CASH WORKING CAPITAL

Q. WOULD YOU PLEASE EXPLAIN THE RATEMAKING PRINCIPLES CONCERNING THE INCLUSION OF WORKING CAPITAL AS AN ELEMENT OF RATE BASE?

A. Yes. The working capital allowance is a component of rate base. A utility's need for working capital was first recognized in the noted United States Supreme Court case, *Smyth v. Ames*.[36] Among the many benchmarks established in the case was the "property devoted to public use" doctrine as a basis for fixing rates. The case recognized that among the matters to be considered in determining the value of property used was "the sum required to meet operating expenses."[37] Since that time, working capital has generally been recognized as a proper item to be included in the rate base on which a utility is entitled to earn a return.

Q. WHAT IS CASH WORKING CAPITAL?

A. Cash working capital is a component of working capital, representing the amount of funds necessary to finance the day-to-day operations of the Company. For ratemaking purposes, cash working capital is included as a

36 *Smyth v. Ames*, 169 U.S. 466 (1898), overruled on other grounds by *Fed Power Comm'n v. Nat. Gas Pipeline Co. of Am.*, 315 U.S. 575, 586 (1942). Specifically, *Fed. Power Comm'n* departed from the holding in *Smyth* that fair market value in cost of service ratemaking must be used and instead concluded that "[t]he Constitution does not bind rate-making bodies to the service of any single formula or combination of formulas."
37 *Id*. at 547.

component of a utility's rate base.

Q. WHY IS CASH WORKING CAPITAL INCLUDED AS AN ELEMENT OF RATE BASE?

A. Working capital is included in rate base to compensate investors for the use of their funds over and above their investment in plant, and to provide investors with a return on the funds required by the Company for daily operations. Cash working capital bridges the gap between the time when funds are provided to the Company by investors to allow the Company to provide service to customers, and the time revenues are received from customers as reimbursement for these services.

OVERVIEW OF A LEAD-LAG STUDY

Q. HOW WAS THE CASH WORKING CAPITAL REQUIREMENT DETERMINED?

A. I conducted a lead-lag study to determine VWPA's cash working capital requirement. The lead-lag study in this case measured the level of funding required to operate on a day-to-day basis in a sufficient amount to cover VWPA's operating expenses (O&M and Taxes). This was measured by calculating the net lag between: (1) the amount of time elapsed between the provision of the cost of service and the receipt of the revenue requirement from the Company's customers (known as the revenue lag); and (2) the

amount of time elapsed between when the Company receives goods and services used by the Company to provide service and the payment by the Company for those operating expense items (known as the expense lead). The difference between these two elapsed periods of time is known as the "net lag." The net lag was multiplied by the average daily operating expenses (or revenue requirement) to determine the Company's cash working capital requirement.

Q. PLEASE DESCRIBE THE COMPONENTS OF A CASH WORKING CAPITAL ANALYSIS.

A. The two primary components of a cash working capital analysis are revenue lags and expense leads. The revenue lag is the elapsed time between when the delivery of a company's product, or provision of service, to its customers occurs and when a company receives payment for the delivery of the product. Investor-provided funds are required to keep a company running during the revenue lag time period, when the revenue stream is temporarily insufficient to finance daily operational needs.

As mentioned above, the expense lead is the elapsed time between when a good or service is provided to a company and when a company pays its supplier, or vendor, for the good or service. During the expense lead time period, cash received from customers may temporarily exceed a

company's payments to its suppliers for goods or services, and the excess may be used to repay investor-provided funds.

The net difference between the revenue lag and expense lead determines a company's cash working capital requirement. Additional details of the revenue lag and the expense lead calculations are provided below.

Q. GENERALLY SPEAKING, HOW DID YOU CALCULATE THE REVENUE LAG?

A. The revenue lag is the sum of three distinct components: the service period lag, the billing lag, and the collection lag.

Q. WHAT IS THE SERVICE PERIOD LAG?

A. The service period lag is the average time between meter readings. The average, or mid-point, between meter readings, based on monthly meter readings, is roughly 15 days. The mid-point service period lag is produced by dividing the service period of roughly 30 days by two.

Q. WHAT IS THE BILLING LAG?

A. The billing lag is the time from the meter reading date to the date the customer is billed. On the customer billing date, the bill is mailed to the

customer, and the total billing amount for the cycle is recorded to VWPA's accounts receivable. The bills are recorded to accounts receivable virtually the same day meters are read.[38]

Q. WHAT IS THE COLLECTION LAG?

A. The collection lag is the average number of days from the date the bills are mailed to customers to the date payments are received by VWPA. This was determined by dividing the average monthly accounts receivable balance during the twelve months ended September 30, 2023, by the average daily billed revenue for the same period.

Q. GENERALLY SPEAKING, HOW DID YOU CALCULATE THE EXPENSE LEAD?

A. In a lead-lag study, the cost of service, or expense, lead days are calculated for each invoice or account by subtracting the midpoints of the service periods (the service lead) from the date the Company paid the invoices or accounts (the payment lead) and then summing these two data points.

The service lead is the average time that a service or good was provided to the Company. If a service or good was provided for 20 days,

38 Only about 0.04% of bills are not posted to accounts receivable on the same day meters are read. This results in the actual billing lag being only 0.0020 days.

the 20-day service period is divided by two to produce a midpoint of ten days for the service period lead.

The payment lead is the number of days from the midpoint of the service period to the payment date for the service or good. If payment for the service or good was provided on the 30th day and the midpoint of the service period was the 10th day, the payment lead is 20 days (30 days – ten days).

Q. WHY ARE MIDPOINTS USED IN THE CASH WORKING CAPITAL ANALYSIS?

A. Midpoints are used to determine the weighted average period during which a service or good is rendered or provided during the service period, or between meter reads. The midpoint assumes that, on average, service is provided evenly over the service period. For example, if a service is provided over a 30-day period, then on average, 30 days of service was provided evenly for 15 days (30÷2) of the service period. Mathematically, the midpoint is the weighted average number of days that the full service period number of days (*e.g.,* 30 days) was provided.

VWPA'S LEAD-LAG STUDY

Q. DID YOU CONSIDER VWPA'S OVERALL COST OF SERVICE IN YOUR LEAD-LAG STUDY?

A. No. I considered only a portion of VWPA's cost of service items in my lead-lag study to be consistent with the lead-lag methodology used in Pennsylvania. In Pennsylvania, lead-lag studies do not include non-cash expense items.

A lead-lag study based on O&M and Taxes likely understates the full cash working capital requirement and affords the minimum cash working capital requirement. A lead-lag study based on the entire revenue requirement and cost of service provides a more accurate measure of the cash working capital requirement.

Q. WHAT DATA SET DID YOU UTILIZE IN YOUR LEAD-LAG STUDY?

A. The data sets were selected after developing an understanding of the Company's collections, payment policies, and procedures. To inform my understanding of these items, I requested representative data sets from the Company. Once the requested raw data had been provided, data validation was performed by comparing an actual invoice or a bill with data from the utility's systems to ensure accuracy.

The revenue lag data set for the Company was based on an accounts receivable analysis of the beginning balance, the monthly charges

to this balance as bills were processed and mailed, and the daily receipts for 365 days of the year during the 12 months ended September 30, 2023. The revenue lag data set for the Company also included an analysis of the cycle billing, the beginning and ending service dates (meter read dates), and the date bills were mailed (or posted).

The expense lead data set was based on information generated from the Company's central accounts payable system. The expense lead data sets for the 12 months ended September 30, 2023, were analyzed to develop the service beginning and ending dates, the amount purchased, and the date of payment for each invoice or account sampled.[39]

Q. WHAT TIME PERIOD DOES YOUR LEAD-LAG STUDY ENCOMPASS?

A. The lead-lag study in this case analyzed the net revenues and the associated net cost of service during the 12 months ended September 30, 2023, to derive the lag (lead) days for the revenue requirement and the related cost of service line items.

39 The sampling for the total expense and tax dollars paid totaled 92%.

Q. HOW WERE THE REVENUE LAG DAYS AND EXPENSE LEAD DAYS USED TO CALCULATE VWPA'S CASH WORKING CAPITAL REQUIREMENT?

A. For each cost of service line item, the lead days (expense) were subtracted from the lag days (revenue) to determine the net lag days for that cost of service line item. Next, the net lag days for that cost of service line item was multiplied by the average O&M and Taxes expense per day (expenses / 365 days) line item to produce the cash working capital required for each cost of service line item. This process was followed for each cost of service line item. Finally, the cash working capital requirement of each cost of service line item were totaled (summed) to calculate VWPA's total cash working capital requirement.

RESULTS OF THE LEAD-LAG STUDY

Q. WHAT ARE THE RESULTS OF THE LEAD-LAG STUDY?

A. The lead-lag schedules are set forth in Schedule HW-1 through Schedule HW-28 provided in my Exhibit HW-1. Schedule HW-1 summarizes VWPA's cash working capital requirements. As shown on page 1 of Schedule HW-1, I determine the Company's working capital for the future test year ("FTY"), the fully projected year ("FPY"), and the fully projected future test year ("FPFTY"). The cash working capital for FTY is $779,156. The cash

working capital requirement for FPY is $782,997 and the cash working capital requirement for FPFTY is $819,040.

Additionally, pages 2 through 5 of Schedule HW-1 summarize the cash working capital requirements of VWPA's Main and Bethel Water Operations, VPWA's Main Sewer Operations, VWPA's Mahoning Water Operations, and VWPA's Mahoning Sewer Operations, respectively. VWPA's Main and Bethel Water Operations' cash working capital for FTY is $756,807, $760,848 for FPY and is $795,083 for FPFTY, as shown on page 2. VWPA's Main Sewer Operations' cash working capital for FTY is $3,386, $3,404 for FPY and is $3,438 for FPFTY, as shown on page 3. VWPA's Mahoning Water Operations' cash working capital for FTY is $5,167, $4,741 for FPY and is $5,223 for FPFTY, as shown on page 4. VWPA's Mahoning Sewer Operations' cash working capital for FTY is $13,797, $13,998 for FPY and is $15,292 for FPFTY, as shown on page 5.

Q. PLEASE DESCRIBE SCHEDULE HW-1.

A. As shown on Schedule HW-1, the cash working capital requirement is based on the net lag days required to finance each cost of service line item. The net lag day calculations are a result of subtracting their respective expense lead days from the revenue lag days to determine the appropriate net lag days, which was multiplied by the average O&M and Taxes expense per day (expenses / 365 days) line item. The lag days for the receipt of the

revenue requirement is developed on Schedule HW-2. The lead days for the cost of service line items are developed on Schedules HW-4 through HW-28, and the schedule references for the lead days for the cost of service line items is shown on the Index to Schedules of Exhibit HW-2.

Q. PLEASE EXPLAIN THE PROCEDURES USED TO DETERMINE VWPA'S CASH WORKING CAPITAL REQUIREMENT SHOWN ON SCHEDULE HW-1.

A. The process used to determine VWPA's cash working capital requirement, shown on page 1 of Schedule HW-1, is generally the same for each line item shown. Because the process is generally the same, I will discuss the purchased power expense line item (first line item) as a means of explaining the methodology used for each line item.[40]

The labor expense line item amount of $7,273,930 (FTY) was divided by 365 days to determine a daily labor expense, which was multiplied by the 23.1 net lag days to determine the FTY cash working capital required amount, $460,350 ($7,273,930 ÷ 365 = $19,928.58 × 23.1 = $460,350). The net lag days of 23.1 were determined by subtracting the labor expense lead days of 11.4 from the 34.5-day revenue lag (34.5 lag days – 11.4 lead days = 23.1 net lag days).

40 All cost of service expense line items were handled in an identical manner.

A similar process was followed for each cost of service line item. The cash working capital requirement of all line items were totaled (summed) to calculate VWPA's $779,156 total FTY cash working capital requirement. A similar procedure was followed to calculate VWPA's FPY cash working capital requirement and FPFTY cash working capital requirement.

Q. PLEASE EXPLAIN THE PROCEDURES USED TO DETERMINE THE REVENUE LAG.

A. Schedule HW-2 shows the development of the 34.5-day lag for the Company's revenue requirement. The revenue requirement lag reflects the Company's service, billings, and collections frequencies.

Q. PLEASE EXPLAIN THE PROCEDURES USED TO DETERMINE THE SERVICE PERIOD AND THE BILLING LAG DAYS FOR CUSTOMER REVENUES.

A. The lag days for the service period and the billing lag are developed on Schedule HW-2. As mentioned previously, the service period lag was measured from the midpoint of the service period to the meter reading date, and the billing lag was measured from the meter reading date to the billing date, or date recorded to accounts receivables.

VWPA's service period, 30.4 days, was divided by two to produce the average service period lag of 15.2 days, as shown on Schedule HW-2.

VWPA's bills are prepared, mailed, and recorded to accounts receivable virtually the same day meters are read (0.002 days). Adding the average service period lag to the billing lag produces a combined 15.2-day service period and billing lag (15.2 days + 0.0 days = 15.2 days) as shown on Schedule HW-2.

Q. PLEASE DESCRIBE THE PROCEDURE USED TO CALCULATE THE COLLECTION LAG.

A. As mentioned previously, the collection lag is the average number of days from the date the bills posted to accounts receivables to the date payments are received. This was determined by dividing the average monthly accounts receivable balance during the test year by the test year's average daily billed revenue. This results in an average collection lag of 19.3 days as shown on Schedule HW-2.

Q. PLEASE SUMMARIZE THE TOTAL REVENUE LAG.

A. The total revenue lag of 34.5 lag days is the result of adding the 15.2-day service period and billing lag and an average collection lag of 19.3 days as shown on Schedule HW-2.

Q. PLEASE EXPLAIN THE CALCULATION OF LEAD DAYS FOR THE O&M AND TAXES EXPENSES SHOWN ON SCHEDULE HW-1.

A. The lead days for O&M and Taxes expenses shown on Schedule HW-1 are comprised of three major sub-accounts including: O&M expenses; taxes other than income taxes; and income taxes. For the cost of service expense items shown, the lead days were calculated for each invoice or account based on the midpoints of the service periods to the dates the Company paid the invoices or accounts based on varying levels of sampling of data.[41]

Q. HOW WERE THE LEAD DAYS DETERMINED FOR THE O&M EXPENSES SUB-ACCOUNT LINE ITEMS SHOWN ON SCHEDULE HW-1?

A. For the O&M expense sub-accounts line items shown, the lead days were determined for each invoice or account sampled based on the midpoints of the service periods to the dates the Company paid the invoices or accounts based on varying levels of sampling of data.[42]

For example, the weighted average lead days for labor expense is 11.4-days (see Schedule HW-3). The lead days for labor expense were

41 As was the case with the revenue service period, a mid-point is used for the service lead because it is assumed service is provided evenly over the service period.
42 The sampling for the total expense and tax dollars paid totaled 92% and reflected a range of sampling from 2% to over 100% of the total line-item dollars (or expenses). Sampling of total line-item dollars greater than 100% of the expense occurred for those line items which included capitalized line items, and/or cash payment versus accrual expense amounts.

calculated for each invoice examined based on the midpoints of the service periods to the dates the Company paid the invoices. In total, 100% of the labor expense were sampled. Similar analyses were conducted for labor expense lead days (see Schedule HW-3), employee group health & life lead days (see Schedule HW-4), employee pension benefits lead days (see Schedule HW-5), other employee benefits lead days (see Schedule HW-6), purchased water lead days (see Schedule HW-7), purchased power lead days (see Schedule HW-8), fuel for power production lead days (see Schedule HW-9), chemicals lead days (see Schedule HW-10), materials and supplies lead days (see Schedule HW-11), management and service fees lead days (see Schedule HW-12), lab testing fees lead days (see Schedule HW-13), outside contractors lead days (see Schedule HW-14), outside professional services lead days (see Schedule HW-15), rental of building/real property lead days (see Schedule HW-16), rental of equipment lead days (see Schedule HW-17), transportation expense lead days (see Schedule HW-18), property & general liability insurance lead days (see Schedule HW-19), worker compensation lead days (see Schedule HW-20), regulatory commission expense lead days (see Schedule HW-21), office expense and utilities lead days (see Schedule HW-22), postage and air freight expense lead days (see Schedule HW-23), and other O&M lead days (see Schedule HW-24).

Q. HOW WERE THE LEAD DAYS DETERMINED FOR THE TAXES OTHER THAN INCOME SUB-ACCOUNT AND INCOME TAXES SUB-ACCOUNT LINE ITEMS SHOWN ON SCHEDULE HW-1?

A. For most of the taxes other than income taxes sub-account and income taxes sub-account line items shown, the lead days were calculated based on the midpoint of the tax liability period to the payment date, weighted by the actual amount paid. The exception to this was income taxes, where the lead days were calculated based on the midpoint of the tax period to the payment date, weighted by the percent of the payment required. The taxes other than income taxes and income taxes sub-account line sub-accounts are shown on Schedule HW-25 through Schedule HW-28. These taxes include real estate tax lead days (see Schedule HW-25), payroll tax lead days (see Schedule HW-26), federal income taxes lead days (see Schedule HW-27), and state income taxes lead days (see Schedule HW-28).

LEAD-LAG STUDY CONCLUSION

Q. WHAT ARE THE RESULTS OF THE LEAD-LAG STUDY?

A. The results of the lead-lag study are shown on Schedule HW-1. The results of the lead-lag study shown on Schedule HW-1 show the required cash working capital to bridge the gap between the time when funds are provided to the Company by investors to allow the Company to provide service to customers, and the time revenues are received from customers as reimbursement for these services. VWPA's cash working capital for FTY is

$779,156. The cash working capital requirement for FPY is $782,997 and the cash working capital requirement for FPFTY is $819,040. VWPA's Main and Bethel Water Operations' cash working capital for FTY is $756,807, $760,848 for FPY and is $795,083 for FPFTY, as shown on page 2. VWPA's Main Sewer Operations' cash working capital for FTY is $3,386, $3,404 for FPY and is $3,438 for FPFTY, as shown on page 3. VWPA's Mahoning Water Operations' cash working capital for FTY is $5,167, $4,741 for FPY and is $5,223 for FPFTY, as shown on page 4. VWPA's Mahoning Sewer Operations' cash working capital for FTY is $13,797, $13,998 for FPY and is $15,292 for FPFTY, as shown on page 5.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does. However, I reserve the right to supplement my testimony as additional issues and facts arise during the course of the proceeding.

APPENDIX A

Professional Qualifications
of
Harold Walker, III
Manager, Financial Studies
Gannett Fleming Valuation and Rate Consultants, LLC.

EDUCATION

Mr. Walker graduated from Pennsylvania State University in 1984 with a Bachelor of Science Degree in Finance. His studies concentrated on securities analysis and portfolio management with an emphasis on economics and quantitative business analysis. He has also completed the regulation and the rate-making process courses presented by the College of Business Administration and Economics Center for Public Utilities at New Mexico State University. Additionally, he has attended programs presented by The Institute of Chartered Financial Analysts (CFA).

Mr. Walker was awarded the professional designation "Certified Rate of Return Analyst" (CRRA) by the Society of Utility and Regulatory Financial Analysts. This designation is based upon education, experience and the successful completion of a comprehensive examination. He is also a member of the Society of Utility and Regulatory Financial Analysts (SURFA) and has attended numerous financial forums sponsored by the Society. The SURFA forums are recognized by the Association for Investment Management and Research (AIMR) and the National Association of State Boards of Accountancy for continuing education credits.

Mr. Walker obtained a license as a Municipal Advisor Representative (Series 50) by Municipal Securities Rulemaking Board (MSRB) and Financial Industry Regulatory Authority (FINRA).

BUSINESS EXPERIENCE

Prior to joining Gannett Fleming Valuation and Rate Consultants, LLC., Mr. Walker was employed by AUS Consultants - Utility Services. He held various positions during his eleven years with AUS, concluding his employment there as a Vice President. His duties included providing and supervising financial and economic studies on behalf of investor owned and municipally owned water, wastewater, electric, natural gas distribution and transmission, oil pipeline and telephone utilities as well as resource recovery companies.

In 1996, Mr. Walker joined Gannett Fleming Valuation and Rate Consultants, LLC. In his capacity as Manager, Financial Studies and for the past twenty years, he has continuously studied rates of return requirements for regulated firms. In this regard, he supervised the preparation of rate of return studies in connection with his testimony and in the past, for other individuals. He also assisted and/or developed dividend policy studies, nuclear prudence studies, calculated fixed charge rates for avoided costs involving cogeneration projects, financial decision studies for capital budgeting purposes and developed financial models for determining future capital requirements and the effect of those requirements on investors and ratepayers, valued utility property and common stock for acquisition and divestiture, and assisted in the private placement of fixed capital securities for public utilities.

Head, Gannett Fleming GASB 34 Task Force responsible for developing Governmental Accounting Standards Board (GASB) 34 services and educating Gannett Fleming personnel and Gannett Fleming clients on GASB 34 and how it may affect them. The GASB 34 related services include inventory of assets, valuation of assets, salvage estimation, annual depreciation rate determination, estimation of depreciation reserve, asset service life determination, asset condition assessment, condition assessment documentation, maintenance estimate for asset preservation, establishment of condition level index, geographic information system (GIS) and data management services, management discussion and analysis (MD&A) reporting, required supplemental information (RSI) reporting, auditor interface, and GASB 34 compliance review.

In 2004, Mr. Walker was elected to serve on the Board of Directors of SURFA. Previously, he served as an ex-officio directors as an advisor to SURFA's existing President. In 2000, Mr. Walker was elected President of SURFA for the 2001-2002 term. Prior to that, he was elected to serve on the Board of Directors of SURFA during the period 1997-1998 and 1999-2000. He also served on the Pennsylvania Municipal Authorities Association, Electric Deregulation Committee.

EXPERT TESTIMONY

Mr. Walker has submitted testimony or been deposed on various topics before regulatory commissions and courts in 27 states including: Alaska, Arizona, California, Colorado, Connecticut, Delaware, Hawaii, Idaho, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Michigan, Missouri, New Hampshire, Nevada, New Jersey, New York, North Carolina, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, and West Virginia. His testimonies covered various subjects including lead-lag studies, fair rate of return, fair market value, the taking of natural resources, benchmarking, appropriate capital structure and fixed capital cost rates, depreciation, purchased water adjustments, synchronization of interest charges for income tax purposes, valuation, cash working capital, financial analyses of investment alternatives, and fair value. The following tabulation provides a listing of the electric power, natural

gas distribution, telephone, wastewater, and water service utility cases in which he has been involved as a witness.

Client	Docket No.
Alpena Power Company	U-10020
Armstrong Telephone Company - Northern Division	92-0884-T-42T
Armstrong Telephone Company - Northern Division	95-0571-T-42T
Artesian Water Company, Inc.	90 10
Artesian Water Company, Inc.	06 158
Aqua Illinois Consolidated Water Divisions and Consolidated Sewer Divisions	11-0436
Aqua Illinois Hawthorn Woods Wastewater Division	07 0620/07 0621/08 0067
Aqua Illinois Hawthorn Woods Water Division	07 0620/07 0621/08 0067
Aqua Illinois Kankakee Water Division	10-0194
Aqua Illinois Kankakee Water Division	14-0419
Aqua Illinois Vermilion Division	07 0620/07 0621/08 0067
Aqua Illinois Willowbrook Wastewater Division	07 0620/07 0621/08 0067
Aqua Illinois Willowbrook Water Division	07 0620/07 0621/08 0067
Aqua Pennsylvania, Inc	A-2022-3034143
Aqua Pennsylvania Wastewater Inc	A-2016-2580061
Aqua Pennsylvania Wastewater Inc	A-2017-2605434
Aqua Pennsylvania Wastewater Inc	A-2018-3001582
Aqua Pennsylvania Wastewater Inc	A-2019-3008491
Aqua Pennsylvania Wastewater Inc	A-2019-3009052
Aqua Pennsylvania Wastewater Inc	A-2019-3015173
Aqua Pennsylvania Wastewater Inc	A-2021-3024267
Aqua Pennsylvania Wastewater Inc	A-2021-3026132
Aqua Pennsylvania Wastewater Inc	A-2021-3027268

Aqua Pennsylvania Wastewater Inc	A-2023-3041695
Aqua Virginia - Alpha Water Corporation	Pue-2009-00059
Aqua Virginia - Blue Ridge Utility Company, Inc.	Pue-2009-00059
Aqua Virginia - Caroline Utilities, Inc. (Wastewater)	Pue-2009-00059
Aqua Virginia - Caroline Utilities, Inc. (Water)	Pue-2009-00059
Aqua Virginia - Earlysville Forest Water Company	Pue-2009-00059
Aqua Virginia - Heritage Homes of Virginia	Pue-2009-00059
Aqua Virginia - Indian River Water Company	Pue-2009-00059
Aqua Virginia - James River Service Corp.	Pue-2009-00059
Aqua Virginia - Lake Holiday Utilities, Inc. (Wastewater)	Pue-2009-00059
Aqua Virginia - Lake Holiday Utilities, Inc. (Water)	Pue-2009-00059
Aqua Virginia - Lake Monticello Services Co. (Wastewater)	Pue-2009-00059
Aqua Virginia - Lake Monticello Services Co. (Water)	Pue-2009-00059
Aqua Virginia - Lake Shawnee	Pue-2009-00059
Aqua Virginia - Land'or Utility Company (Wastewater)	Pue-2009-00059
Aqua Virginia - Land'or Utility Company (Water)	Pue-2009-00059
Aqua Virginia - Mountainview Water Company, Inc.	Pue-2009-00059
Aqua Virginia - Powhatan Water Works, Inc.	Pue-2009-00059
Aqua Virginia - Rainbow Forest Water Corporation	Pue-2009-00059
Aqua Virginia - Shawnee Land	Pue-2009-00059
Aqua Virginia - Sydnor Water Corporation	Pue-2009-00059
Aqua Virginia - Water Distributors, Inc.	Pue-2009-00059
Atlantic City Sewerage Company	WR21071006
Berkshire Gas Company	18-40
Berkshire Gas Company	22-20
Bermuda Water Company, Inc	W-01812A-22-0256
Borough of Brentwood	A-2021-3024058
Borough of Hanover	R-2009-2106908
Borough of Hanover	R-2012-2311725

Borough of Hanover	R-2014-242830
Borough of Hanover	R-2021-3026116
Borough of Hanover	P-2021-3026854
Borough of Royersford	A-2020-3019634
Butler Area Sewer Authority	A-2020-3019634
Chaparral City Water Company	W 02113a 04 0616
California-American Water Company	CIVCV156413
Connecticut-American Water Company	99-08-32
Connecticut Water Company	06 07 08
Citizens Utilities Company	
Colorado Gas Division	-
Citizens Utilities Company	
Vermont Electric Division	5426
Citizens Utilities Home Water Company	R 901664
Citizens Utilities Water Company	
of Pennsylvania	R 901663
City of Beaver Falls	A-2022-3033138
City of Bethlehem - Bureau of Water	R-00984375
City of Bethlehem - Bureau of Water	R 00072492
City of Bethlehem - Bureau of Water	R-2013-2390244
City of Bethlehem - Bureau of Water	R-2020-3020256
City of Dubois – Bureau of Water	R-2013-2350509
City of Dubois – Bureau of Water	R-2016-2554150
City of Lancaster Sewer Fund	R-00005109
City of Lancaster Sewer Fund	R-00049862
City of Lancaster Sewer Fund	R-2012-2310366
City of Lancaster Sewer Fund	R-2019-3010955
City of Lancaster Sewer Fund	R-2019-3010955
City of Lancaster Water Fund	R-00984567
City of Lancaster Water Fund	R-00016114
City of Lancaster Water Fund	R 00051167
City of Lancaster Water Fund	R-2010-2179103
City of Lancaster Water Fund	R-2014-2418872
City of Lancaster Water Fund	R-2021-3026682
City of Lancaster Water Fund	P-2022-3035591

Coastland Corporation	15-cvs-216
Consumers Pennsylvania Water Company Roaring Creek Division	R-00973869
Consumers Pennsylvania Water Company Shenango Valley Division	R-00973972
Country Knolls Water Works, Inc.	90 W 0458
East Resources, Inc. - West Virginia Utility	06 0445 G 42T
Elizabethtown Water Company	WR06030257
ENSTAR Natural Gas Company	U-22-081
Falls Water Company, Inc.	FLS-W-23-01
Forest Park, Inc.	19-W-0168 & 19-W-0269
Hampton Water Works Company	DW 99-057
Hidden Valley Utility Services, LP	R-2018-3001306
Hidden Valley Utility Services, LP	R-2018-3001307
Illinois American Water Company	16-0093
Illinois American Water Company	22-0210
Indian Rock Water Company	R-911971
Indiana Natural Gas Corporation	38891
Jamaica Water Supply Company	-
Kane Borough Authority	A-2019-3014248
Kentucky American Water Company, Inc.	2007 00134
Kentucky American Water Company, Inc.	2023-00191
Middlesex Water Company	WR 89030266J
Millcreek Township Water Authority	55 198 Y 00021 11
Missouri-American Water Company	WR 2000-281
Missouri-American Water Company	SR 2000-282
Missouri-American Water Company	WR-2022-0303
Mount Holly Water Company	WR06030257
Nevada Power Company d/b/a NV Energy	20-06003
Nevada Power Company d/b/a NV Energy	23-06007
New Jersey American Water Company	WR 89080702J
New Jersey American Water Company	WR 90090950J
New Jersey American Water Company	WR 03070511
New Jersey American Water Company	WR-06030257
New Jersey American Water Company	WR08010020

New Jersey American Water Company	WR10040260
New Jersey American Water Company	WR11070460
New Jersey American Water Company	WR15010035
New Jersey American Water Company	WR17090985
New Jersey American Water Company	WR19121516
New Jersey American Water Company	WR22010019
New Jersey Natural Gas Company	GR19030420
New Jersey Natural Gas Company	GR21030679
Newtown Artesian Water Company	R-911977
Newtown Artesian Water Company	R-00943157
Newtown Artesian Water Company	R-2009-2117550
Newtown Artesian Water Company	R-2011-2230259
Newtown Artesian Water Company	R-2017-2624240
Newtown Artesian Water Company	R-2019-3006904
North Maine Utilities	14-0396
Northern Indiana Fuel & Light Company	38770
Oklahoma Natural Gas Company	PUD-940000477
Palmetto Utilities, Inc.	2020-281-S
Palmetto Wastewater Reclamation, LLC	2018-82-S
Pennichuck Water Works, Inc.	DW 04 048
Pennichuck Water Works, Inc.	DW 06 073
Pennichuck Water Works, Inc.	DW 08 073
Pennsylvania-American Water Company	A-2023-3039900
Pennsylvania Gas & Water Company (Gas)	R-891261
Pennsylvania Gas & Water Co. (Water)	R 901726
Pennsylvania Gas & Water Co. (Water)	R-911966
Pennsylvania Gas & Water Co. (Water)	R-22404
Pennsylvania Gas & Water Co. (Water)	R-00922482
Pennsylvania Gas & Water Co. (Water)	R-00932667
Philadelphia Gas Works	R-2020-3017206
Philadelphia Gas Works	R-2023-3037933
Public Service Company of North Carolina, Inc.	G-5, Sub 565
Public Service Electric and Gas Company	ER181010029
Public Service Electric and Gas Company	GR18010030
Presque Isle Harbor Water Company	U-9702

Sierra Pacific Power Company d/b/a NV Energy	19-06002
Sierra Pacific Power Company d/b/a NV Energy	22-06014
St. Louis County Water Company	WR-2000-844
Suez Water Delaware, Inc.	19-0615
Suez Water Idaho, Inc.	SUZ-W-20-02
Suez Water New Jersey, Inc.	WR18050593
Suez Water New Jersey, Inc.	WR20110729
Suez Water Owego-Nichols, Inc.	17-W-0528
Suez Water Pennsylvania, Inc.	R-2018-3000834
Suez Water Pennsylvania, Inc.	A-2018-3003519
Suez Water Pennsylvania, Inc.	A-2018-3003517
Suez Water Rhode Island, Inc.	Docket No. 4800
Suez Water Owego-Nichols, Inc.	19-W-0168 & 19-W-0269
Suez Water New York, Inc.	19-W-0168 & 19-W-0269
Suez Westchester, Inc.	19-W-0168 & 19-W-0269
Town of North East Water Fund	9190
Township of Exeter	A-2018-3004933
United Water New Rochelle	W-95-W-1168
United Water Toms River	WR-95050219
Upper Pottsgrove Township	A-2020-3021460
Valley Township (water)	A-2020-3019859
Valley Township (wastewater)	A-2020-3020178
Valley Water Systems, Inc.	06 10 07
Veolia Water Idaho, Inc.	VEO-W-22-02
Veolia Water Delaware, Inc.	23-0598
Veolia Water New York, Inc.	23-W-0111
Virginia American Water Company	PUR-2018-00175
Virginia American Water Company	PUR-2021-00255
Virginia American Water Company	PUR-2023-00194
West Virginia-American Water Company	15-0676-W-42T
West Virginia-American Water Company	15-0675-S-42T
Wilmington Suburban Water Corporation	94-149
York Water Company	R-901813
York Water Company	R-922168

York Water Company	R-943053
York Water Company	R-963619
York Water Company	R-994605
York Water Company	R-00016236
Young Brothers, LLC	2019-0117