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May 24, 2022

BY E-FILING

Mr. Adam Teitzman, Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: **Docket No. 20220067-GU: Petition for rate increase by Florida Public Utilities Company, Florida Division of Chesapeake Utilities Corporation, Florida Public Utilities Company - Fort Meade, and Florida Public Utilities Company - Indiantown Division.**

Dear Mr. Teitzman:

Attached, for electronic filing, please find the Testimony and Exhibit PRM-1 of Paul Moul.

Thank you for your assistance with this filing. As always, please don't hesitate to let me know if you have any questions whatsoever.

(Document 11 of 27)

Sincerely,

Beth Keating
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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA PUBLIC UTILITIES COMPANY

Docket No. 20220067-GU

Direct Testimony and Exhibits

Of

Paul R. Moul

Florida Public Utilities Company
Direct Testimony of Paul R. Moul

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GLOSSARY OF ACRONYMS AND DEFINED TERMS	
ACRONYM	**DEFINED TERM**
AFUDC	Allowance for Funds Used During Construction
β	Beta
b	Represents the retention rate that consists of the fraction of earnings that are not paid out as dividends
b x r	Represents internal growth
CAPM	Capital Asset Pricing Model
CCR	Corporate Credit Rating
CE	Comparable Earnings
CFG	Central Florida Gas division of Chesapeake Utilities Corporation
CUC	Chesapeake Utilities Corporation
CWIP	Construction Work in Progress
DCF	Discounted Cash Flow
EPACT	National Energy Policy Act
FERC	Federal Energy Regulatory Commission
FOMC	Federal Open Market Committee
FPUC	Florida Public Utilities Company
IGF	Internally Generated Funds
LT	Long Term
M&M	Modigliani & Miller
MPL	Minimum pension liability
NAIC	National Association of Insurance Commissioners
OCI	Other Comprehensive Income
r	Represents the expected rate of return on common equity
Rf	Risk-free rate of return
Rm	Return on the market
RP	Risk Premium
s	Represents the new common shares expected to be issued by a firm
s x v	Represents external growth
S&P	Standard & Poor's
v	Represents the value that accrues to existing shareholders from selling stock at a price different from book value

FLORIDA PUBLIC UTILITIES COMPANY
DIRECT TESTIMONY OF
PAUL R. MOUL

INTRODUCTION AND SUMMARY OF RECOMMENDATIONS

Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Paul Ronald Moul. My business address is 251 Hopkins Road, Haddonfield, Florida 08033-3062. I am Managing Consultant at the firm P. Moul & Associates, an independent financial and regulatory consulting firm. My educational background, business experience and qualifications are provided in Appendix A, which follows my Direct Testimony.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. My testimony presents evidence, analysis, and a recommendation concerning the appropriate rate of return that the Florida Public Service Commission ("FPSC" or the "Commission") should recognize in the determination of the revenues that Florida Public Utilities Company ("FPUC") and the Florida natural gas division (i.e., Central Florida Gas or "CFG") of Chesapeake Utilities Corporation ("CUC" or the Parent Company) should realize as a result of this proceeding. My analysis and recommendation are supported by the detailed financial data set forth in Exhibit No. PRM-1, which is a thirty (30) page document that is divided into Schedules 1 through 15. My testimony is based upon my firsthand knowledge of FPUC and CUC consisting of information obtained from meetings with FPUC's management as well as both Parent Company and Company-specific data, which is widely disseminated within the financial community. For purposes of clarity, I will

refer to the consolidated entity consisting of FPUC, CFG, FPUC-Indiantown Division, and FPUC-Fort Meade together as "Company."

Q. BASED UPON YOUR ANALYSIS, WHAT IS YOUR CONCLUSION CONCERNING THE APPROPRIATE RATE OF RETURN FOR THE COMPANY IN THIS CASE?

A. Based upon my analysis of the Company, it is my opinion that the rate of return on common equity should be set within the range of 10.75% to 11.75%. My cost of equity determination should be viewed in the context of the need for supportive regulation at a time of increased infrastructure improvements now underway for the Company. As shown on page 1 of Schedule 1, I have presented the weighted average cost of capital for the Company, which is calculated for the test year ending December 31, 2023. I should note that the Company has made adjustments to my overall rate of return recommendation to include deferred income taxes as zero-cost capital because these items are not treated as rate base deductions in Florida. My recommended range of the rate of return and return on equity range are shown below:

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	39.44%	3.46%	1.36%
Short-Term Debt	5.51%	3.30%	0.18%
Common Equity	55.05%	10.75%	5.92%
Total	100.00%		7.46%

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	39.44%	3.46%	1.36%
Short-Term Debt	5.51%	3.30%	0.18%
Common Equity	55.05%	11.75%	6.47%
Total	100.00%		8.01%

From this range, I recommend that the Company's proposed rates be set to include a 7.73% overall rate of return that contains an 11.25% cost of equity. Those returns are shown on page 1 of Schedule 1 of Exhibit No. PRM-1. The resulting overall cost of capital, which is the product of weighting the individual capital costs by the proportion of each respective type of capital, should establish a compensatory level of return for the use of capital and, if achieved, will provide the Company with the ability to attract capital on reasonable terms.

Q. WHAT BACKGROUND INFORMATION HAVE YOU CONSIDERED IN REACHING A CONCLUSION CONCERNING THE COMPANY'S COST OF CAPITAL?

A. The Company provides natural gas distribution service to approximately 90,000 customers in twenty-one counties throughout Florida. For the year 2021, the Company's gas throughput (combined sales and transportation) was represented by approximately 5% to residential customers, 14% to commercial customers, 74% to industrial customers, and 7% to other customers. It is noteworthy that the major percentage of the Company's throughput is represented by industrial sales. However, these customers represent less than 3% of the Company's entire customer

base. This means that the energy needs of a few customers can have a significant impact on the Company's operations.

The Company obtains its natural gas supply through connections with the six interstate pipelines and purchase agreements with gas commodity suppliers. The Company is a wholly-owned subsidiary of CUC. CUC provides the Company with all of its investor required capital -- both debt and equity.

Q. HOW HAVE YOU DETERMINED THE COST OF COMMON EQUITY IN THIS CASE?

A. The cost of common equity is established using capital market and financial data relied upon by investors to assess the relative risk, and hence the cost of equity, for a gas distribution utility, such as the Company. In this regard, I have considered four (4) well-recognized measures of the cost of equity: the Discounted Cash Flow ("DCF") model, the Risk Premium ("RP") analysis, the Capital Asset Pricing Model ("CAPM"), the Comparable Earnings ("CE") approach. The results of my analysis of these well-recognized analyses indicates that the Company's rate of return on common equity should be in the range of 10.75% to 11.75%.

Q. IS THE MARKET IMPACT OF THE COVID-19 PANDEMIC REFLECTED IN YOUR ANALYSIS OF THE COST OF EQUITY FOR THE COMPANY?

A. Yes. My cost of equity analysis reflects the impact of the COVID-19 Pandemic ("Pandemic"). These events had a significant impact on the stock and bond markets beginning in the February-March 2020 time frame. During this period, we saw abrupt reaction to the Pandemic, which ended a record-setting, 128-month economic expansion. As we entered a recession in February 2020, extraordinary

actions were taken by the Federal Open Market Committee ("FOMC") to address these disruptions. Recently, renewed economic growth has produced inflation levels higher than have been seen in four decades. Indeed, in February 2022, the rate of inflation spiked upward to 7.9%, the highest in forty-years, due to Pandemic-related supply side issues, strong consumer demand, and tight labor markets. Supply shortages have also significantly impacted the consumer sector of the economy. Energy prices have increased as well, with the commodity cost of natural gas moving up. While short-term interest rates remain at historically low levels, longer term interest rates began to rise in February 2021. At present, short-term interest rates are poised to increase after the FOMC ends its bond buying program. The FOMC has indicated that several increases in the Fed Funds rate will likely occur in 2022 and 2023. The first of these increases occurred on March 16, 2022, when the Fed Funds rate was increased by 0.25%. Recently, the yield on ten-year Treasury notes reached 2.00% for the first time since mid-2019. Over the course of the Pandemic, stock prices rebounded and reached a new high in reaction to renewed economic growth. While there has been a pullback in overall market prices in early 2022, commonly known as a market correction, it followed a stellar market performance in 2021 i.e., a 26.89% annual price appreciation. I have considered these events as they impact the inputs that I used in the various models of the cost of equity.

Q. IN YOUR OPINION, WHAT FACTORS SHOULD THE COMMISSION CONSIDER WHEN DETERMINING THE COMPANY'S COST OF CAPITAL IN THIS PROCEEDING?

A. The Commission's rate of return allowance must be set to cover the Company's interest and dividend payments, provide a reasonable level of earnings retention, produce an adequate level of internally generated funds to meet capital requirements, be commensurate with the risk to which the Company's capital is exposed, assure confidence in the financial integrity of the Company, support reasonable credit quality, and allow the Company to raise capital on reasonable terms. The return that I propose fulfills these established standards of a fair rate of return set forth by the landmark Bluefield and Hope cases.[1] That is to say, my proposed rate of return is commensurate with returns available on investments having corresponding risks.

Q. HOW HAVE YOU MEASURED THE COST OF EQUITY IN THIS CASE?

A. The models that I used to measure the cost of common equity for the Company were applied with market and financial data developed from a group of eight (8) gas companies. The companies are identified on page 2 of Schedule 3. I will refer to these companies as the "Gas Group" throughout my testimony.

Q. PLEASE EXPLAIN THE SELECTION PROCESS USED TO ASSEMBLE THE GAS GROUP?

A. I began with all of the gas utilities contained in the Value Line Investment Survey, which consists of ten companies. Value Line is an investment advisory service that is a widely-used source in public utility rate cases. I eliminated two companies from the Value Line group. UGI Corporation was removed due to its large international presence as well as the relative proportion of its regulated businesses

[1] Bluefield Water Works & Improvement Co. v. P.S.C. of West Virginia, 262 U.S. 679 (1923) and F.P.C. v. Hope Natural Gas Co., 320 U.S. 591 (1944).

to the overall company. UGI Corporation's portfolio consists of six reportable segments, including propane, two international LPG segments, natural gas utility, energy services, and electric generation. Of the total business, UGI Corporation generated 14% of its revenues and 10% of its earnings from the regulated utilities for the twelve months ended September 30, 2021. Further, only 29% of UGI's assets are devoted to regulated businesses (as of September 30, 2021). I also removed South Jersey Industries from the Gas Group because it entered into an agreement to be acquired by a private equity investor. The remaining eight companies in the Gas Group are identified on page 2 of Schedule 3.

Q. HOW HAVE YOU PERFORMED YOUR COST OF EQUITY ANALYSIS WITH THE MARKET DATA FOR THE GAS GROUP?

A. I have applied the models/methods for estimating the cost of equity using the average data for the Gas Group. I have not measured separately the cost of equity for the individual companies within the Gas Group, because the determination of the cost of equity for an individual company can be problematic. The use of group average data will reduce the effect of potentially anomalous results for an individual company if a company-by-company approach were utilized. In other words, employing group average data, rather than individual company analysis, minimizes the effect of extraneous influences on the market data for an individual company.

Q. PLEASE SUMMARIZE YOUR COST OF EQUITY ANALYSIS.

A. My cost of equity determination was derived from the results of the methods/models identified above. In general, the use of more than one method provides a superior foundation to arrive at the cost of equity. At any point in time,

any single method can provide an incomplete measure of the cost of equity. The specific application of these methods/models will be described later in my testimony. The following table sets forth the results that are summarized on page 2 of Schedule 1 using each of these approaches.

	Excluding Flotation Costs	Including Flotation Costs [1]
DCF	11.65%	11.82%
RP	10.75%	10.92%
CAPM	14.41%	14.58%
CE	12.05%	12.05%

The average of all methods is 12.22%, excluding flotation costs, and 12.34%, including flotation costs. The median values are 11.85%, excluding flotation costs and 11.94% including flotation costs. From these measures, I recommend a cost of equity of 10.75% to 11.75%. The low end of my range is based on the Risk Premium approach excluding flotation costs. The upper end of my range is represented by median return of 11.85%, excluding flotation cost, and rounded down to the nearest quarter percentage point. The midpoint of the range is 11.25% and is near the average of the DCF and Risk Premium approaches, excluding flotation costs. My recommendation in this case is represented by the 11.25% midpoint cost of equity. To obtain new capital and retain existing capital, the rate of return on common equity must be high enough to satisfy investors' requirements.

[2] Flotation costs are defined as the out-of-pocket costs associated with the issuance of common stock. Those costs typically consist of the underwriters' discount and company issuance expenses.

To obtain new capital and retain existing capital, the rate of return on common equity for FPUC must be high enough to recognize the risks and uncertainties of its business and the requirements of the capital markets.

NATURAL GAS RISK FACTORS

Q. WHAT FACTORS CURRENTLY AFFECT THE BUSINESS RISK OF NATURAL GAS UTILITIES?

A. Gas utilities face risks arising from competition, economic regulation, the business cycle, and customer usage patterns. Presently, supply side issues and inflationary pressures are adversely impacting the business risk of natural gas utilities and other companies. Today, they operate in a complex environment with time frames for decision-making considerably shortened. Their business profile is influenced by market-oriented pricing for the commodity distributed to customers and open access for the transportation of natural gas for customers. The gas distribution industry also faces the risk associated with increased availability of renewable energy sources, expanded emphasis on energy efficiency, and potential initiatives directed toward decarbonization as a national energy policy.

Natural gas utilities have focused increased attention on safety and reliability issues and on conservation. In order to address these issues and to comply with new and pending pipeline safety regulations, natural gas companies are now allocating more of their resources to addressing aging infrastructure issues. The testimony of Company witnesses discusses the investments that the Company has made and will make to address these issues.

Q. PLEASE DISCUSS SOME OF THE OPERATIONAL RISKS FACED BY THE COMPANY?

A. Risks that affect the Company's operations relate to adequate delivery capability, counterparty risk and risks related to cyber-security. For many of the Company's customers, they obtain their natural gas directly from third-party marketers. The Company is also faced with counterparty risk should suppliers fail to perform their obligations, especially with regard to hedging obligations. In addition, the handling of natural gas is attended with safety considerations. Finally, cyber-attacks have increased risks to gas delivery systems, elevating the need for enhanced cyber-security systems to protect gas customers and companies from attack by foreign enemies and domestic terrorists.

The natural gas business also faces significant competition from alternative energy sources. The Company faces direct competition from electricity, fuel oil, and propane in its service territory. Propane and fuel oil have an advantage because they are subject to minimal regulatory constraints when conducting their marketing activities.

Q. HOW DOES THE COMPANY'S THROUGHPUT TO LARGE VOLUME CUSTOMERS AFFECT ITS RISK PROFILE?

A. CUC's risk profile is significantly influenced by natural gas delivered to industrial customers. Indeed, CUC's industrial customers represent 74% of the total throughput. Deliveries to these customers are usually thought to be of higher risk than sales to other customers. Success in this aspect of the Company's market is subject to the business cycle, the price of alternative energy sources, and pressures

from the competitors noted above, as well as other competing natural gas service providers. Moreover, external factors can also influence the Company's throughput to these customers which face competitive pressure on their operations from facilities located outside the Company's service territory.

Q. WHAT RISKS ARE ASSOCIATED WITH THE COMPANY'S INFRASTRUCTURE?

A. The Company must maintain and replace, where appropriate, its aging infrastructure and is in the process of doing so across its service territory. To maintain safe and reliable service to existing customers, the Company must invest in these infrastructure upgrades.

The continuing cost of upgrading, replacing and expanding CUC's infrastructure is expected keep the level of construction expenditures at heightened levels. Over the next five years, CUC's total capital expenditures for all its divisions and subsidiaries are expected to be approximately $798.618 million. These expenditures will represent an approximate 45% ($798.618 million ÷ $1,744.878 million) increase in its net utility plant from the level at December 31, 2021. For the Company, capital expenditures in Florida are expected to be $193.983 million for the next five-years. There is the potential for actual spending to exceed these levels. At the forecasted level, this represents 47% ($193.983 million ÷ $415.807 million) of net utility plant at December 31, 2021. As noted previously, a fair rate of return for the Company represents a key to a financial profile that will provide the Company with the ability to raise the capital necessary to meet its capital needs on an ongoing basis. The need for infrastructure replacement is prevalent

throughout the natural gas industry. CUC must compete for capital with other natural gas companies in other states, as well as other utilities and non-regulated companies. To successfully compete, it must have a fair rate of return on invested capital.

Q. HOW SHOULD THE COMMISSION RESPOND TO THE ISSUES FACING THE NATURAL GAS UTILITIES AND, IN PARTICULAR, THE COMPANY?

A. The Commission should recognize and take into account the competitive environment, as well as the business and physical risks inherent in providing natural gas service to end use customers, in determining the cost of capital for the Company, and provide a reasonable opportunity for the Company to actually achieve its cost of capital during a period of significant, continuous investments in its infrastructure.

FUNDAMENTAL RISK ANALYSIS

Q. IS IT NECESSARY TO CONDUCT A FUNDAMENTAL RISK ANALYSIS TO PROVIDE A FRAMEWORK FOR A DETERMINATION OF A UTILITY'S COST OF EQUITY?

A. Yes, it is. It is necessary to establish a company's relative risk position within its industry through a fundamental analysis of various quantitative and qualitative factors that bear upon investors' assessment of overall risk. The qualitative factors that bear upon the Company's risk have already been discussed. The quantitative risk analysis follows. For this purpose, I compared the CUC to the S&P Public Utilities, an industry-wide proxy consisting of various regulated businesses, and to

the Gas Group. CUC is used here, rather than the Company, because CUC obtains and allocates capital to its divisions and subsidiaries.

Q. WHAT ARE THE COMPONENTS OF THE S&P PUBLIC UTILITIES?

A. The S&P Public Utilities is a widely recognized index that is comprised of electric power and natural gas companies. These companies are identified on page 3 of Schedule 4.

Q. WHAT COMPANIES COMPRISE THE GAS GROUP?

A. My Gas Group consists of the following companies: Atmos Energy Corp., Chesapeake Utilities Corporation, New Jersey Resources Corp., NiSource, Inc., Northwest Natural Holding Co., ONE Gas, Inc., Southwest Gas Holdings, and Spire, Inc.

Q. IS KNOWLEDGE OF A UTILITY'S BOND RATING AN IMPORTANT FACTOR IN ASSESSING ITS RISK AND COST OF CAPITAL?

A. Yes. Knowledge of a company's credit quality rating is important because the cost of each type of capital is directly related to the associated risk of the firm. So, while a company's credit quality risk is shown directly by the rating and yield on its bonds, these relative risk assessments also bear upon the cost of equity. This is because a firm's cost of equity is represented by its borrowing cost, plus compensation, to recognize the higher risk of an equity investment compared to debt.

Q. HOW DO THE CREDIT QUALITY RATINGS COMPARE FOR THE COMPANY, THE GAS GROUP, AND THE S&P PUBLIC UTILITIES?

A. There is no public rating on the debt of CUC. The long-term debt of CUC carries

a designation of "2b" from the National Association of Insurance Commissioners ("NAIC"), which represents investment grade debt and is equivalent to the Baa/BBB ratings by Standard & Poor's Corporation ("S&P") and Moody's Investors Service ("Moody's") -- both national recognized credit rating agencies. Presently, the average corporate credit rating ("CCR") for the Gas Group is A- from S&P and the Long Term ("LT") issuer rating in A3 from Moody's. The CCR designation by S&P and LT issuer rating by Moody's focuses upon the credit quality of the issuer of the debt, rather than upon the debt obligation itself. The bond ratings for the companies in the Gas Group are displayed on page 2 of Schedule 3. For the S&P Public Utilities, the average Long Term ("LT") issuer credit quality rating credit quality rating is A3 by Moody's and BBB+ by S&P, as shown on page 3 of Schedule 4. The credit quality rating for CUC is slightly lower than the Gas Group, largely reflecting the larger short-term debt balances the Company has maintained historically as it has undertaken various multi-year projects. The Company's strategy is to align the permanent financing with the in-service dates of the large projects to ensure that permanent financing matches recovery of capital costs. Many of the financial indicators that I will subsequently discuss are considered during the rating process.

Q. HOW DO THE FINANCIAL DATA COMPARE FOR THE COMPANY, THE GAS GROUP, AND THE S&P PUBLIC UTILITIES?

A. The broad categories of financial data that I will discuss are shown on Schedules 2, 3, and 4. The data cover the five-year period from 2017-2021. The important categories of relative risk may be summarized as follows:

Size. In terms of capitalization, CUC is much smaller than the average size of the Gas Group, and very much smaller than the average size of the S&P Public Utilities. All other things being equal, a smaller company is riskier than a larger company because a given change in revenue and expense has a proportionately greater impact on a small firm. As I will demonstrate later, the size of a firm can impact its cost of equity. This is the case for CUC and the Gas Group as compared to the S&P Public Utilities.

Market Ratios. Market-based financial ratios, such as earnings/price ratios and dividend yields, provide a partial measure of the investor-required cost of equity. If all other factors are equal, investors will require a higher rate of return for companies that exhibit greater risk. That is to say, a firm that investors perceive to have higher risks will experience a lower price per share in relation to expected earnings.[3]

The five-year average price-earnings ("P-E") multiple was fairly similar for CUC, the Gas Group and the S&P Public Utilities. The five-year average dividend yield was lowest for CUC, followed by the Gas Group and the S&P Public Utilities, which had the highest dividend yield. The five-year average market-to-book ratio was highest for CUC, while the market-to-book rates was somewhat lower for the Gas Group as compared to the S&P Public Utilities.

Common Equity Ratio. The level of financial risk is measured by the proportion of long-term debt and other senior capital that is contained in a

[3] For example, two otherwise similarly situated firms each reporting $1.00 in earnings per share would have different market prices at varying levels of risk (i.e., the firm with a higher level of risk will have a lower share value, while the firm with a lower risk profile will have a higher share value).

company's capitalization. Financial risk is also analyzed by comparing common equity ratios (the complement of the ratio of debt and other senior capital). A firm with a higher common equity ratio has lower financial risk, while a firm with a lower common equity ratio has higher financial risk. The five-year average common equity ratios, based on permanent capital, were 60.1% for CUC, 50.5% for the Gas Group, and 41.0% for the S&P Public Utilities. CUC's common equity ratio was higher than the Gas Group, thereby indicating increased balance sheet strength and lower financial risk.

Return on Book Equity. Greater variability (i.e., uncertainty) of a firm's earned returns signifies relatively greater levels of risk, as shown by the coefficient of variation (standard deviation ÷ mean) of the rate of return on book common equity. The higher the coefficients of variation, the greater degree of variability. For the five-year period, the coefficients of variation were 0.044 (0.5% ÷ 11.4%) for CUC, 0.106 (1.0% ÷ 9.4%) for the Gas Group, and 0.051 (0.5% ÷ 9.9%) for the S&P Public Utilities. The variability of CUC's rates of return was somewhat close to the S&P Public Utilities and lower than the Gas Group.

Operating Ratios. I have also compared operating ratios (the percentage of revenues consumed by operating expense, depreciation, and taxes other than income).[4] The five-year average operating ratios were 80.9% for CUC, 82.9% for the Gas Group, and 79.8% for the S&P Public Utilities. CUC's operating ratios were close to the Gas Group, and the S&P Public Utilities, which indicates similarity of risk.

[4] The complement of the operating ratio is the operating margin that provides a measure of profitability. The higher the operating ratio, the lower the operating margin.

Coverage. The level of fixed charge coverage (i.e., the multiple by which available earnings cover fixed charges, such as interest expense) provides an indication of the earnings protection for creditors. Higher levels of coverage, and hence earnings protection for fixed charges, are usually associated with superior grades of creditworthiness. Excluding Allowance for Funds Used During Construction ("AFUDC"), the five-year average pre-tax interest coverage was 5.78 times for CUC, 4.29 times for the Gas Group, and 2.97 times for the S&P Public Utilities. The interest coverages were higher for CUC as compared to the Gas Group, thereby indicating lower credit risk for lenders.

Quality of Earnings. Measures of earnings quality usually are revealed by the percentage of AFUDC related to income available for common equity, the effective income tax rate, and other cost deferrals. These measures of earnings quality usually influence a firm's internally generated funds because poor quality of earnings would not generate high levels of cash flow. During the pandemic, there was further pressure on cash flows due to the suspension of collection activities and the moratorium against service disconnections for nonpayment. Quality of earnings has not been a significant concern for CUC, the Gas Group, and the S&P Public Utilities.

Internally Generated Funds. Internally generated funds ("IGF") provide an important source of new investment capital for a utility and represent a key measure of credit strength. Historically, the five-year average percentage of IGF to capital expenditures was 64.0% for CUC, 56.9% for the Gas Group, and 66.0% for the S&P Public Utilities. In each instance, there is a compelling need for external

capital from investors in order to fund capital expenditure requirements. A reasonable return is necessary in order to attract that capital.

Betas. The financial data that I have been discussing relate primarily to company-specific risks. Market risk for firms with publicly-traded stock is measured by beta coefficients. Beta coefficients attempt to identify systematic risk, i.e., the risk associated with changes in the overall market for common equities.[5] Value Line publishes such a statistical measure of a stock's relative historical volatility to the rest of the market. A comparison of market risk is shown by the Value Line beta of 0.80 for CUC, 0.86 as the average for the Gas Group (see page 2 of Schedule 3) and 0.90 as the average for the S&P Public Utilities (see page 3 of Schedule 4). The systematic risk for the Gas Group as measured by the Value Line beta is fairly similar to the S&P Public Utilities.

Q. PLEASE SUMMARIZE YOUR RISK EVALUATION.

A. The investment risk of CUC parallels that of the Gas Group in certain respects. CUC has lower risk as shown by its lower beta, historically higher common equity ratio, its lower variability of earnings, and its higher interest coverages, but its operating ratio, quality of earnings and internally generated funds factors are comparable to those of the Gas Group. The Company's overall risk is higher than the Gas Group due to its smaller size. In addition, the higher levels of short-term debt and the absence of a formal credit rating could also impact the overall risk

[5] Beta is a relative measure of the historical sensitivity of the stock's price to overall fluctuations in the New York Stock Exchange Composite Index. The ''Beta coefficient'' is derived from a regression analysis of the relationship between weekly percentage changes in the price of a stock and weekly percentage changes in the NYSE Index over a period of five years. The betas are adjusted for their long-term tendency to converge toward 1.00. A common stock that has a beta less than 1.0 is considered to have less systematic risk than the market as a whole and would be expected to rise and fall more slowly than the rest of the market. A stock with a beta above 1.0 would have more systematic risk.

profile, although the Company has successfully managed these while accessing competitively priced capital.

Q. BASED ON YOUR ANALYSIS, DOES THE GAS GROUP PROVIDE A REASONABLE BASIS TO MEASURE THE COMPANY'S COST OF EQUITY FOR THIS CASE?

A. Yes. On balance, the risk factors average out, indicating that the cost of equity for the Gas Group provides a reasonable basis for measuring the Company's cost of equity.

CAPITAL STRUCTURE RATIOS

Q. PLEASE EXPLAIN THE SELECTION OF CAPITAL STRUCTURE RATIOS FOR THE COMPANY.

A. CUC provides all the permanent capital, both debt and equity, for all its divisions and subsidiaries, e.g., FPUC. For this case, CUC's capital structure ratios have been employed for rate of return purposes.

Q. DOES SCHEDULE 5 PROVIDE THE CAPITALIZATION AND CAPITAL STRUCTURE RATIOS YOU HAVE CONSIDERED?

A. Yes. Schedule 5 presents the CUC's actual capitalization and related capital structure ratios at December 31, 2021 and projected at the December 31, 2022 and December 31, 2023.

Q. WHAT FINANCING ARRANGEMENTS ARE CURRENTLY IN PLACE FOR CUC?

A. CUC presently has "shelf" agreements with Prudential and MetLife. These agreements expire in April 2023 and May 2023, respectively. The original amounts

of these agreements have previously been partially drawn upon. The remaining borrowing capacity is $150 million and $100 million, respectively. It is currently projected that CUC will issue $80 million under these agreements on December 1, 2022. The interest rate and terms of payment will be determined at the time of issuance. The proceeds received from the issuances of these shelf notes will be used to reduce short-term borrowings under the revolver and/or to fund capital expenditures.

Q. HAVE YOU MADE ADJUSTMENTS TO THE CUC CAPITAL STRUCTURE RATIOS FOR RATESETTING PURPOSES?

A. Yes. I have eliminated accumulated other comprehensive income (OCI") and the debt associated with Marlin subsidiary equipment financing that is secured by the associated equipment. The Marlin equipment financing provides no source of funds available to other divisions of CUC or to the Company and therefore, is eliminated from the capital structure for this case.

Q. PLEASE EXPLAIN THE JUSTIFICATION FOR REMOVING THE ACCUMULATED OCI?

A. The accumulated OCI must be eliminated from the capital structure for ratesetting purposes. OCI arises from a variety of sources, including minimum pension liability ("MPL"), foreign currency hedges, unrealized gains and losses on securities available for sale, interest rate swaps, and other cash flow hedges. The accumulated OCI for the Company has its roots in the MPL and commodity contracts cash flow hedges. None of the accounting entries that affect accumulated OCI have anything to do with financing the rate base of the Company (i.e., they do

not generate or consume any cash). A MPL entry must be recorded on the balance sheet when the present value of the pension benefit earned by employees exceeds the market value of trust fund assets. As such, MPL arises from changes in stock market values and interest rates, which impacts the value of the trust fund assets, as well as the present value of the pension benefit obligation. Due to the uncertainty associated with OCI, it should be excluded from the common equity.

Q. WHAT CAPITAL STRUCTURE RATIOS DO YOU RECOMMEND BE ADOPTED FOR RATE OF RETURN PURPOSES IN THIS PROCEEDING?

A. Since rate-setting is prospective, the rate of return should consider conditions that will exist during the period of time the proposed rates will be effective. I, therefore, propose the test year-end capital structure ratios of 39.44% long-term debt 5.51% short-term debt, and 55.05% common equity. These ratios are appropriate because CUC provides all investor-provided capital to the Company. As such, the Commission should establish new rates using these ratios. Adjustments for deferred income taxes would be required for applications to the rate base.

COST OF SENIOR CAPITAL

Q. WHAT COST RATE HAVE YOU ASSIGNED TO THE DEBT PORTION OF THE COMPANY'S CAPITAL STRUCTURE?

A. The determination of the cost of debt is essentially an arithmetic exercise. This is due to the fact that CUC has contracted for the use of this capital for a specific period of time at a specified cost rate. As shown on page 1 of Schedule 6, the actual embedded cost of long-term debt was 3.58% at December 31, 2021. The embedded cost of long-term debt is expected to be 3.46% at December 31, 2023, as shown on

page 3 of Schedule 6. The details leading to the development of the individual effective cost rates for each series of long-term debt are shown on page 3 of Schedule 6. The cost rate, or yield to maturity, is the rate of discount that equates to the present value of the interest and principal payments with the net proceeds of the bond. That is to say, the effective cost rate is the internal rate of return ("IRR") that equates the present value of all future interest and principal payments with the net proceeds of the bond.

For this analysis, I adopted the 3.46% embedded cost of long-term debt for rate of return purposes, because the 3.46% long-term debt cost rate is directly associated to the amount of long-term debt shown on Schedule 5 and provides the basis for the 39.44% long-term debt ratio.

Q. THE COMPANY HAS FORECAST NEW ISSUES OF LONG-TERM DEBT FOR CUC IN DECEMBER 2022. IS THE RATE OF INTEREST ON THE NEW LONG-TERM DEBT FINANCING REASONABLE?

A. Yes. For the December 2022 new issue by CUC, the Company has forecast a rate of 4.00%. The Company is proposing a fifteen-year term for its proposed new issues of long-term debt. This rate is reasonable based upon the forecast contained in the Blue Chip Financial Forecasts, which I will describe below. Blue Chip provides a consensus forecast of future interest rates. According to Blue Chip, the consensus yield on thirty-year Treasury bonds is forecast to be 2.7% for the fourth quarter of 2022 (see page 2 of Schedule 14). Adding to that yield the interest rate spread of 1.25% related to A-rated public utility bonds that I will describe below, the Blue Chip derived yield would be 3.95% (i.e., 2.7% + 1.25%). Since the

Company's NAIC rating is" 2a," a higher rate would be required for this proposed issue. Hence, 4.00% is reasonable.

Q. WHAT COST RATE FOR SHORT-TERM DEBT HAS BEEN PROPOSED IN THIS CASE?

A. The forecast interest rate for short-term debt would be 3.30%. This is derived based on the forecasted general trend toward higher short-term debt interest rates. The forecast London Interbank Offered Rate ("LIBOR") rate is 2.4179%. The resulting cost rate for CUC's short-term borrowings is: LIBOR forecast of 2.4179% + spread of 0.7000% over the LIBOR rate + $180,000 commitment fee, which represents 0.09% of the unused portion of the $200 million of the borrowing capacity.

Therefore, the forecasted interest rate for short-term debt would be 3.30% (2.4179% + 0.7000% + 0.1821%), which reflects the 0.70% margin that the Company is required to pay under its short-term credit facility that exceeds LIBOR plus the commitment fee on unused borrowings.

COST OF EQUITY – GENERAL APPROACH

Q. PLEASE DESCRIBE HOW YOU DETERMINED THE COST OF EQUITY FOR THE COMPANY.

A. Although my fundamental financial analysis provides the required framework to establish the risk relationships among CUC, the Gas Group, and the S&P Public Utilities, the cost of equity must be measured by standard financial models that I identify above. Differences in risk traits, such as size, business diversification, geographical diversity, regulatory policy, financial leverage, and bond ratings must be considered when analyzing the cost of equity.

It is also important to reiterate that no one method or model of the cost of equity can be applied in an isolated manner. Rather, informed judgment must be used to take into consideration the relative risk traits of the company. It is for this reason that I have used more than one method to measure the CUC's cost of equity. As I describe below, each of the methods used to measure the cost of equity contains certain incomplete and/or overly restrictive assumptions and constraints that are not optimal. Therefore, I favor considering the results from a variety of methods. In this regard, I applied each of the methods with data taken from the Gas Group and arrived at a cost of equity in the range of 10.75% to 11.75% for the CUC and FPUC.

DISCOUNTED CASH FLOW

Q. PLEASE DESCRIBE THE DCF MODEL.

A. The DCF model seeks to explain the value of an asset as the present value of future expected cash flows discounted at the appropriate risk-adjusted rate of return. In its simplest form, the DCF-determined return on common stock consists of a current cash (dividend) yield and future price appreciation (growth) of the investment. The dividend discount equation is the familiar DCF valuation model, which assumes that future dividends are systematically related to one another by a constant growth rate. The DCF formula is derived from the standard valuation model: $P = D/(k-g)$, where P = price, D = dividend, k = the cost of equity, and g = growth in cash flows. By rearranging the terms, we obtain the familiar DCF equation: $k= D/P + g$. All of the terms in the DCF equation represent investors' assessment of expected future cash flows that they will receive in relation to the value that they set for a share of

stock (P). The DCF equation is sometimes referred to as the "Gordon" model.[6] My DCF results are provided on Schedule 1, page 2, for the Gas Group. Excluding flotation costs, the DCF return is 11.65% with the leverage adjustment and 10.20% without the leverage adjustment for the Gas Group. The leverage adjustment is discussed more fully below. Flotation costs add 0.17% to the returns noted above.

Among the limitations of the model, there is a certain element of circularity in the DCF method when applied in rate cases. This is because investors' expectations for the future depend upon regulatory decisions. In turn, when regulators depend upon the DCF model to set the cost of equity, they rely upon investor expectations that include an assessment of how regulators will decide rate cases. Due to this circularity, the DCF model may not fully reflect the true risk of a utility. Other limitations of the DCF include the constant P-E multiple assertion that does not conform with actual stock market performance. And, indeed, the FERC has moved to using multiple methods for measuring the cost of equity due to the limitations of the DCF.

Q. WHAT IS THE DIVIDEND YIELD COMPONENT OF A DCF ANALYSIS?

A. The dividend yield reveals the portion of investors' cash flow that is generated by the return provided by the dividends an investor receives. It is measured by the dividends per share relative to the price per share. The DCF methodology requires the use of an expected dividend yield to establish the investor-required cost of equity. For the twelve months ended February 2022, the monthly dividend yields

[6] Although the popular application of the DCF model is often attributed to the work of Myron J. Gordon in the mid-1950s, J.B. Williams exposited the DCF model in its present form nearly two decades earlier.

are shown on Schedule 7. The month-end prices were adjusted to reflect the buildup of the dividend in the price that has occurred since the last ex-dividend date (i.e., the date by which a shareholder must own the shares to be entitled to the dividend payment – usually about two to three weeks prior to the actual payment).

For the twelve months ended February 2022, the average dividend yield was 3.22% for the Gas Group based upon a calculation using annualized dividend payments and adjusted month-end stock prices. The dividend yields for the more recent six-month and three-month periods were 3.33% and 3.16%, respectively. For applying the DCF model, I have used the six-month average dividend yield of 3.33% for the Gas Group. The use of this dividend yield will reflect current capital costs while avoiding spot yields. For the DCF calculation, the average dividend yield must be adjusted to reflect the prospective nature of the dividend payments, i.e., the higher expected dividends for the future. Recall that the DCF is an expectational model that must reflect investors' anticipated cash flows. I have adjusted the six-month average dividend yield in three different, but generally-accepted, manners and used the average of the three adjusted values as calculated in the lower panel of data presented on Schedule 7.[7] This adjustment adds twelve basis points to the six-month average historical yield, thus producing the 3.45% adjusted dividend yield for the Gas Group.

[7] These adjustments are the 1/2 growth approach, the discrete approach, and the quarterly approach. Under the 1/2 growth approach, the procedure to adjust the average dividend yield for the expectation of a dividend increase during the initial investment period will be at a rate of one-half the growth component, which assumes that half of the dividend payments will be at the expected higher rate during the initial investment period. Under the discrete approach, the "*g*" in the DCF model reflects the discrete growth in the quarterly dividend, which is required for the periodic form of the DCF to properly recognize that dividends are expected to grow on a discrete basis. The quarterly approach takes into account that investors have the opportunity to reinvest quarterly dividend receipts. Recognizing the compounding of the periodic quarterly dividend payments (D_0) results in this third DCF formulation.

Q. WHAT FACTORS INFLUENCE INVESTORS' GROWTH EXPECTATIONS?

A. As noted previously, investors are interested principally in the dividend yield and future growth of their investment (i.e., the price per share of the stock). Future growth in earnings per share is the DCF model's primary focus because, under the model's assumption that the P-E multiple remains constant, the price per share of stock will grow at the same rate as earnings per share. A growth rate analysis considers a variety of factors to reach a consensus of prospective growth, including historical data and widely available analysts' forecasts of earnings, dividends, book value, and cash flow (all stated on a per-share basis). A fundamental growth rate analysis is frequently based upon internal growth ("b x r"), where "r" is the expected rate of return on common equity and "b" is the retention rate (a fraction representing the proportion of earnings not paid out as dividends). To be complete, the internal growth rate should be modified to account for sales of new common stock (external growth), which is represented by the formula "s x v", where "s" is the number of new common shares that the firm expects to issue and "v" is the value that accrues to existing shareholders from selling stock at a price above book value. Fundamental growth, which combines internal and external growth, encompasses the factors that cause book value per share to grow over time.

Growth also can be expressed in multiple stages. This expression of growth consists of an initial "growth" stage during which a firm enjoys rapidly expanding markets, high profit margins, and abnormally high growth in earnings per share. Thereafter, a firm enters a "transition" stage during which fewer technological

advances and increased product saturation begin to reduce the growth rate and profit margins come under pressure. During the "transition" stage, investment opportunities begin to mature, capital requirements decline, and a firm begins to pay out a larger percentage of earnings to shareholders. Finally, the mature or "steady-state" stage is reached when a firm's earnings growth, payout ratio, and return on equity stabilize at levels where they remain for the life of a firm. The three stages of growth assume a step-down of high initial growth to lower sustainable growth. Even if these three stages of growth can be envisioned for a firm, the third "steady-state" growth stage, which is assumed to remain fixed in perpetuity, represents an unrealistic expectation because the three stages of growth can be repeated. That is to say, the stages can be repeated where growth for a firm ramps up and ramps down in cycles over time. For these reasons, there is no need to analyze growth rates individually for each cycle. Instead, the better course is to rely upon analysts' growth forecasts that are used by investors when pricing common stocks.

Q. HOW DID YOU DETERMINE AN APPROPRIATE GROWTH RATE?

A. The growth rate used in a DCF calculation should measure investor expectations. Investors consider both company-specific variables and overall market sentiment (i.e., level of inflation rates, interest rates, economic conditions, etc.) when balancing their capital gains expectations with their dividend yield requirements. Investors are not influenced solely by a single set of company-specific variables weighted in a formulaic manner. Therefore, all relevant growth rate indicators

should be evaluated using a variety of techniques when formulating a judgment of investor-expected growth.

Q. WHAT DATA FOR THE GAS GROUP HAVE YOU CONSIDERED IN YOUR GROWTH RATE ANALYSIS?

A. I considered the growth in the financial variables shown on Schedules 8 and 9, which reflect historical (Schedule 8) and projected (Schedule 9) rates of growth in earnings per share, dividends per share, book value per share, and cash flow per share for the Gas Group. While analysts will review all measures of growth, as I have done, earnings per share growth directly influences the expectations of investors for the future performance of utility stocks. Forecasts of earnings growth are required because the DCF model is forward-looking, and, with the constant P-E multiple and constant payout ratio that the DCF model assumes, all other measures of growth will mirror earnings growth. I used the historical growth rates from the Value Line publication that provides this data. While historical data cannot be ignored, they are much less significant when applying the DCF model than projections of future growth. Investors cannot purchase the past earnings of a utility. To the contrary they are only entitled to future earnings, which are the focus of growth projections. Furthermore, if significant weight is assigned to historical performance, the historical data are double-counted because they are already factored into analysts' forecasts of earnings growth.

Q. IS A FIVE-YEAR INVESTMENT HORIZON ASSOCIATED WITH THE ANALYSTS' FORECASTS CONSISTENT WITH THE TRADITIONAL DCF MODEL?

A. Yes, it is. Although the constant form of the DCF model assumes an infinite stream of cash flows, investors do not expect to hold an investment indefinitely. Rather than viewing the DCF in the context of an endless stream of growing dividends (e.g., a century of cash flows), the growth in the share value (i.e., capital appreciation, or capital gains yield) is most relevant to investors' total return expectations. Hence, the sale price of a stock can be viewed as a liquidating dividend that can be discounted along with the annual dividend receipts during the investment-holding period to arrive at the investors' expected return. The growth in the price per share will equal the growth in earnings per share if, as the DCF model assumes, there is no change in the P-E multiple. As such, my company-specific growth analysis, which focuses principally upon five-year forecasts of earnings per share growth, conforms with the type of analysis that influences investors' expectations of their actual total return. Moreover, academic research also focuses on five-year growth rates specifically because market outcomes occurring over that investment horizon are what influence stock prices. Indeed, if investors required forecasts beyond five years in order to properly value common stocks, then it would be reasonable to expect that some investment advisory service would begin publishing that information for individual stocks in order to meet the demands of the marketplace. The absence of such a publication suggests that there is no market for this information because investors do not require forecasts for an infinite series of future data points in order to make informed decisions to purchase and sell stocks.

Q. WHAT ARE THE ANALYSTS' FORECASTS OF FUTURE GROWTH THAT YOU CONSIDERED?

A. Schedule 9 provides projected earnings per share growth rates taken from analysts' five-year forecasts compiled by IBES/First Call, Zacks, and Value Line. These are all reliable authorities of projected growth that investors use to make buy, sell, and hold decisions. The IBES/First Call and Zacks estimates are obtained from the Internet and are widely available to investors. The growth rates reported by IBES/First Call and Zacks are consensus forecasts taken from a survey of analysts that make growth projections for these companies. Notably, First Call's earnings forecasts are frequently quoted in the financial press. The Value Line forecasts also are widely available to investors and can be obtained by subscription or free of charge at most public and collegiate libraries. The IBES/First Call and Zacks forecasts are limited to earnings per share growth, while Value Line makes projections of other financial variables. The Value Line forecasts of dividends per share, book value per share, and cash flow per share for the Gas Group are also included on Schedule 9.

Q. WHAT ARE THE PROJECTED GROWTH RATES PUBLISHED BY THE SOURCES YOU DISCUSSED?

A. Schedule 9 shows the prospective five-year earnings per share growth rates projected for the Gas Group by IBES/First Call (4.83%), Zacks (6.00%), and Value Line (7.44%).

Q. ARE CERTAIN GROWTH RATE FORECASTS ENTITLED TO GREATER WEIGHT IN DEVELOPING A GROWTH RATE FOR USE IN THE DCF MODEL?

A. Yes. While a variety of factors should be examined to reach a reasonable conclusion on the DCF growth rate, growth in earnings per share should receive the greatest emphasis. Growth in earnings per share is the primary determinant of investors' expectations of the total returns they will obtain from stocks because the capital gains yield (i.e., price appreciation) will track earnings growth if the P-E multiple remains constant, as the DCF model assumes. Moreover, earnings per share (derived from net income) are the source of dividend payments and are the primary driver of retention growth and its surrogate, i.e., book value per share growth. As such, under these circumstances, greater emphasis must be placed upon projected earnings per share growth. In fact, Professor Gordon, the foremost proponent of the use of the DCF model in setting utility rates, concluded that the best measure of growth for use in the DCF model is a forecast of earnings per-share growth.[8] Consistent with Professor Gordon's findings, projections of earnings per share growth, such as those published by IBES/First Call, Zacks, and Value Line, provide the best indication of investor expectations.

Q. WHAT GROWTH RATE DO YOU USE IN YOUR DCF MODEL?

A. The forecasts shown on Schedule 9 for the Gas Group exhibit a range of average earnings per share growth rates from 4.83% to 7.44%. DCF growth rates should not, however, be established by mathematical formulation, and I have not done so.

[8] Gordon, Gordon & Gould, "Choice Among Methods of Estimating Share Yield," The Journal of Portfolio Management (Spring 1989).

In my opinion, a growth rate of 6.75% is a reasonable estimate of investor-expected growth for the Gas Group. This value is within the array of analysts' forecasts of five-year earnings per share growth rates. The reasonableness of this growth rate is also supported by the expected continuation of gas utility infrastructure spending.

Q. ARE THE DIVIDEND YIELD AND GROWTH COMPONENTS OF THE DCF ADEQUATE TO ACCURATELY DEPICT THE RATE OF RETURN ON COMMON EQUITY WHEN IT IS USED TO CALCULATE A UTILITY'S WEIGHTED AVERAGE OVERALL COST OF CAPITAL?

A. The components of the DCF model are adequate for that purpose only if the capital structure ratios are measured by the market value of debt and equity. In the case of the Gas Group, average capital structure ratios are 40.89% long-term debt, 0.45% preferred stock, and 58.66% common equity, as shown on Schedule 10. If book values are used to compute the capital structure ratios, then a leverage adjustment is required.

Q. WHAT IS A LEVERAGE ADJUSTMENT?

A. If a firm's capitalization, as measured by its stock price, diverges from its capitalization, measured at book value, the potential exists for a financial risk difference. Such a risk difference arises because a market-valued capitalization contains more equity and less debt than a book-value capitalization and, therefore, has less risk than the book-value capitalization. A leverage adjustment properly accounts for the risk differential between market-value and book-value capital structures.

Q. WHY IS A LEVERAGE ADJUSTMENT NECESSARY?

A. In order to make the DCF results relevant to the capitalization measured at book value (as is done for rate setting purposes), the market-derived cost rate must be adjusted to account for this difference in financial risk. The only perspective that is important to investors is the return that they can realize on the market value of their investment. As I have measured the DCF, the simple yield (D/P) plus growth (g) provides a return applicable strictly to the price (P) that an investor is willing to pay for a share of stock. The need for the leverage adjustment arises when the results of the DCF model (k) are to be applied to a capital structure that is different from the capital structure indicated by the market price (P). From the market perspective, the financial risk of the Gas Group is accurately measured by the capital structure ratios calculated from the market-valued capitalization of a firm. If the ratemaking process utilized the market capitalization ratios, then no additional analysis or adjustment would be required, and the simple yield (D/P) plus growth (g) components of the DCF would satisfy the financial risk associated with the market value of the equity capitalization. Because the ratemaking process uses ratios calculated from a firm's book value capitalization, further analysis is required to synchronize the financial risk of the book capitalization with the required return on the book value of the firm's equity. This adjustment is developed through precise mathematical calculations, using well-recognized analytical procedures that are widely accepted in the financial literature. To arrive at that return, the rate of return on common equity is the unleveraged cost of capital (or equity return at 100% equity) plus one or more terms reflecting the increase in

financial risk resulting from the use of leverage in the capital structure. The calculations presented in the lower panel of data shown on Schedule 10, under the heading "M&M,"[9] provide a return of 7.70% when applicable to a capital structure with 100% common equity.

Q. ARE THERE SPECIFIC FACTORS THAT INFLUENCE MARKET-TO-BOOK RATIOS THAT DETERMINE WHETHER THE LEVERAGE ADJUSTMENT SHOULD BE MADE?

A. No. The leverage adjustment is not intended, nor was it designed, to address the reasons that stock prices vary from book value. Hence, any observations concerning market prices relative to book value are not on point. The leverage adjustment deals with the issue of financial risk and does not transform the DCF result to a book value return through a market-to-book adjustment. Again, the leverage adjustment that I propose is based on the fundamental financial precept that the cost of equity is equal to the rate of return for an unleveraged firm (i.e., where the overall rate of return equates to the cost of equity with a capital structure that contains 100% equity) plus the additional return required for introducing debt and/or preferred stock leverage into the capital structure.

Further, as noted previously, the relatively high market prices of utility stocks cannot be attributed solely to the notion that these companies are expected to earn a return on the book value of equity that differs from their cost of equity determined from stock market prices. Stock prices above book value are common

[9] Franco Modigliani and Merton H. Miller, "The Cost of Capital, Corporation Finance, and the Theory of Investments," American Economic Review, June 1958, at 261-97. Franco Modigliani and Merton H. Miller, "Taxes and the Cost of Capital: A Correction," American Economic Review, June 1963, at 433-43.

for utility stocks, and indeed the stock prices of non-regulated companies exceed book values by even greater margins.

Finally, the leverage adjustment adds stability to the final DCF cost rate. That is to say, as the market capitalization increases relative to its book value, the leverage adjustment increases while the simple yield (D/P) plus growth (g) result declines. The reverse is also true: when the market capitalization declines, the leverage adjustment also declines as the simple yield (D/P) plus growth (g) result increases.

Q. IS THE LEVERAGE ADJUSTMENT THAT YOU PROPOSE DESIGNED TO TRANSFORM THE MARKET RETURN INTO ONE THAT IS DESIGNED TO PRODUCE A PARTICULAR MARKET-TO-BOOK RATIO?

A. No, it is not. What I label a "leverage adjustment" is merely a convenient way of showing the amount that must be added to (or subtracted from) the result of the simple DCF model (i.e., D/P + g) when the DCF return applies to a capital structure used for ratemaking that is computed with book-value weighting rather than market-value weighting. Although I specify a separate factor, which I call the leverage adjustment, there is no need to do so other than to identify this factor. If I were to express my return solely in the context of the book value weighting that we use to calculate the weighted average cost of capital and ignore the familiar D/P+g expression entirely, then a separate element in the DCF cost of equity determination would not be needed to reflect the differential in financial leverage between a market-value and book-value capitalization. As shown in the bottom panel of data

on Schedule 10, the equity return applicable to the book value common equity ratio is equal to 7.70%, which is the return for the Gas Group appropriate for a capital structure with no debt (i.e., a 100% equity ratio) plus 3.88% to compensate investors for the risk of a 51.27% debt ratio and 0.07% for a 1.73% preferred stock ratio. These are the book-value ratios that differ markedly from the market-value based ratios I discussed previously. Under this approach, the parts add up to 11.65% (7.70% + 3.88% + 0.07%), and there is no need to even address the cost of equity in terms of D/P + g. To express this same return in the context of the familiar DCF model, I added the 3.45% dividend yield, the 6.75% growth rate, and 1.45% for the leverage adjustment in order to arrive at the same 11.65% (3.45% + 6.75% + 1.45%) return. I know of no means to mathematically solve for the 1.45% leverage adjustment by expressing it in the terms of any particular relationship of market price to book value. The 1.45% adjustment is merely a convenient way to compare the 11.65% return computed using the Modigliani & Miller[10] formulas to the 10.20% return generated by the DCF model (i.e., $D_1/P_0 + g$, or the traditional form of the DCF shown on Schedule 1, page 2) based on a market-value capital structure. A 10.20% return assigned to anything other than the market value of equity cannot equate to a reasonable return on book value that has higher financial risk. My point is that when we use a market-determined cost of equity developed from the DCF model, it reflects a level of financial risk that is different (in this case,

[10] Franco Modigliani and Merton H. Miller, The Cost of Capital, Corporation Finance, and the Theory of Investments, American Economic Review, June 1958, at 261-297. Franco Modigliani and Merton H. Miller, Taxes and the Cost of Capital: A Correction, American Economic Review, June 1963, at 433-443.

lower) from the capital structure stated at book value. This process has nothing to do with targeting any particular market-to-book ratio.

Q. PLEASE PROVIDE THE DCF RETURN BASED UPON YOUR PRECEDING DISCUSSION OF DIVIDEND YIELD, GROWTH, AND LEVERAGE.

A. As explained previously, I have utilized a six-month average dividend yield (D_1/P_0) adjusted in a forward-looking manner for my DCF calculation. This dividend yield is used in conjunction with the growth rate (g) previously developed. The DCF also includes the leverage modification (Lev.) required when the book value equity ratio is used in determining the weighted average cost of capital in the ratemaking process rather than the market value equity ratio related to the price of stock. The cost of equity must also include an adjustment to cover flotation costs (flot.), as shown on Schedule 11. In developing the flotation cost adjustment factor, I reduced the 3.9% issuance and selling expenses shown on Schedule 11 to 1.5%. I did this because I applied the adjustment factor (i.e., 1.000 + 0.015) to the entire DCF return, rather than to just the dividend yield component. The resulting DCF cost rate is 11.82%, computed as follows:

	D_1/P_0	+	g	+	*lev.*	=	k	x	*flot.*	=	K
Gas Group	3.45%	+	6.75%	+	1.45%	=	11.65%	x	1.015	=	11.82%

As indicated by the DCF result shown above, the flotation cost adjustment adds 0.17% (11.82% - 11.65%) to the rate of return on common equity for the Gas Group. The DCF result shown above represents the simplified (i.e., Gordon) form of the model that contains a constant-growth assumption. I should reiterate,

however, that the DCF-indicated cost rate provides an explanation of the rate of return on common stock market prices without regard to the prospect of a change in the P-E multiple. An assumption that there will be no change in the P-E multiple is not supported by the realities of the equity market because P-E multiples do not remain constant. This is one of the constraints of this model that makes it important to consider the results of other models when determining a company's cost of equity.

RISK PREMIUM ANALYSIS

Q. PLEASE DESCRIBE YOUR USE OF THE RISK PREMIUM APPROACH TO DETERMINE THE COST OF EQUITY.

A. With the Risk Premium approach, the cost of equity capital is determined by corporate bond yields plus a premium in order to account for the fact that common equity is exposed to greater investment risk than debt capital. The result of my Risk Premium study is shown on Schedule 1, page 2. That result is 10.75%, excluding flotation costs.

Q. WHAT LONG-TERM PUBLIC UTILITY DEBT COST RATE DID YOU USE IN YOUR RISK PREMIUM ANALYSIS?

A. In my opinion, and as I will explain in more detail further in my testimony, a 4.00% yield represents a reasonable estimate of the prospective yield on long-term, A-rated public utility bonds.

Q. WHAT HISTORICAL DATA ARE SHOWN BY THE MOODY'S DATA?

A. I have analyzed the historical yields on the Moody's index of long-term public utility debt as shown on Schedule 12, page 1. For the twelve months ended

February 2022, the average monthly yield on Moody's index of A-rated public utility bonds was 3.20%. For the six- and three-month periods ended February 2022, the yields were 3.20% and 3.38%, respectively. During the twelve months ended February 2022, the range of the yields on A-rated public utility bonds was 2.95% to 3.68%. Page 2 of Schedule 12 shows the long-run spread in yields between A-rated public utility bonds and long-term Treasury bonds. As shown on page 3 of Schedule 12, the yields on A-rated public utility bonds have exceeded those on Treasury bonds by 1.10% on a twelve-month average basis, 1.18% on a six-month average basis, and 1.31% on a three-month average basis. With these data, 1.25% represents a reasonable spread for the yield on A-rated public utility bonds over Treasury bonds.

Q. WHAT FORECASTS OF INTEREST RATES HAVE YOU CONSIDERED IN YOUR ANALYSIS?

A. I have determined the prospective yield on A-rated public utility debt by using the Blue Chip Financial Forecasts ("Blue Chip") along with the spread in the yields that I describe below. Blue Chip is a reliable authority and contains consensus forecasts of a variety of interest rates compiled from a panel of banking, brokerage, and investment advisory services. In early 1999, Blue Chip stopped publishing forecasts of yields on A-rated public utility bonds because the Federal Reserve deleted these yields from its Statistical Release H.15. To independently project a forecast of the yields on A-rated public utility bonds, I have combined the forecast yields on long-term Treasury bonds published on March 1, 2022, and a yield spread of 1.25%, derived from historical data.

Q. HOW HAVE YOU USED THESE DATA TO PROJECT THE YIELD ON A-RATED PUBLIC UTILITY BONDS FOR THE PURPOSE OF YOUR RISK PREMIUM ANALYSES?

A. Shown below is my calculation of the prospective yield on A-rated public utility bonds using the building blocks discussed above, i.e., the Blue Chip forecast of Treasury bond yields and the public utility bond yield spread. For comparative purposes, I also have shown the Blue Chip forecasts of Aaa-rated and Baa-rated corporate bonds. These forecasts are:

		Blue Chip Financial Forecasts				
		Corporate		30-Year	A-rated Public Utility	
Year	Quarter	Aaa-rated	Baa-rated	Treasury	Spread	Yield
2022	First	3.2%	3.9%	2.2%	1.25%	3.45%
2022	Second	3.4%	4.2%	2.5%	1.25%	3.75%
2022	Third	3.7%	4.4%	2.6%	1.25%	3.85%
2022	Fourth	3.9%	4.6%	2.7%	1.25%	3.95%
2023	First	4.0%	4.8%	2.9%	1.25%	4.15%
2023	Second	4.1%	4.9%	3.0%	1.25%	4.25%

Q. ARE THERE ADDITIONAL FORECASTS OF INTEREST RATES THAT EXTEND BEYOND THOSE SHOWN ABOVE?

A. Yes. Twice yearly, Blue Chip provides long-term forecasts of interest rates. In its December 1, 2021, publication Blue Chip published longer-term forecasts of interest rates, which were reported to be:

	Blue Chip Financial Forecasts		
	Corporate		30-Year
Averages	Aaa-rated	Baa-rated	Treasury
2022-2026	4.40%	5.20%	3.40%
2027-2031	4.90%	5.70%	3.80%

The longer-term forecasts by Blue Chip suggest that interest rates will move up from the levels revealed by the near-term forecasts. A 4.00% yield on A-rated

public utility bonds represents a reasonable benchmark for measuring the cost of equity in this case. All the data I used to formulate my conclusion as to a prospective yield on A-rated public utility debt are available to investors, who regularly rely upon such data to make investment decisions. Recent FOMC pronouncements have moved the forecasts of interest rates to higher levels.

Q. WHAT EQUITY RISK PREMIUM HAVE YOU DETERMINED FOR PUBLIC UTILITIES?

A. To develop an appropriate equity risk premium, I analyzed the results from 2022 SBBI Yearbook, Stocks, Bonds, Bills and Inflation. My investigation reveals that the equity risk premium varies according to the level of interest rates. That is to say, the equity risk premium increases as interest rates decline, and it declines as interest rates increase. This inverse relationship is revealed by the summary data presented below and shown on Schedule 13, page 1.

Common Equity Risk Premiums

Low Interest Rates	6.81%
Average Across All Interest Rates	5.93%
High Interest Rates	5.05%

Based on my analysis of the historical data, the equity risk premium was 6.81% when the marginal cost of long-term government bonds was low (i.e., 2.80%, which was the average yield during periods of low rates). Conversely, when the yield on long-term government bonds was high (i.e., 7.03% on average during periods of high interest rates), the spread narrowed to 5.05%. Over the entire spectrum of interest rates, the equity risk premium was 5.93% when the average

government bond yield was 4.92%. I have utilized a 6.75% equity risk premium. The equity risk premium of 6.75% that I employed is near the risk premiums (i.e., 6.81%) associated with low interest rates (i.e., 2.80%).

Q. WHAT COMMON EQUITY COST RATE DID YOU DETERMINE BASED ON YOUR RISK PREMIUM ANALYSIS?

A. The cost of equity (i.e., "k") is represented by the sum of the prospective yield for long-term public utility debt (i.e., "i"), the equity risk premium (i.e., "RP"), and the adjustment for flotation costs (i.e., flot.). The Risk Premium approach provides a cost of equity of:

	i		***RP***		***k***		***flot.***		***K***
Gas Group	4.00%	+	6.75%	=	10.75%	+	0.17%	=	10.92%

CAPITAL ASSET PRICING MODEL

Q. HOW IS THE CAPM USED TO MEASURE THE COST OF EQUITY?

A. The CAPM uses the yield on a risk-free interest-bearing obligation plus a rate of return premium that is proportional to the risk of an investment. As shown on page 2 of Schedule 1, the result of the CAPM is 14.41%, excluding flotation costs, for the Gas Group with the leverage adjustment. Without the leverage adjustment, the CAPM result is 12.57% (14.41% - (0.18 x 10.23%)). To compute the cost of equity with the CAPM, three components are necessary: a risk-free rate of return ("Rf"), the beta measure of systematic risk ("β"), and the market risk premium ("Rm-Rf") derived from the total return on the market of equities reduced by the risk-free rate of return. The CAPM specifically accounts for differences in systematic risk (i.e.,

market risk as measured by the beta) between an individual firm or group of firms and the entire market of equities.

Q. WHAT BETAS HAVE YOU CONSIDERED IN THE CAPM?

A. For my CAPM analysis, I initially considered the Value Line betas. As shown on page 2 of Schedule 3, the average beta is 0.86 for the Gas Group.

Q. DID YOU USE THE VALUE LINE BETAS IN THE CAPM DETERMINED COST OF EQUITY?

A. I used the Value Line betas as a foundation for the leverage adjusted betas that I used in the CAPM. The betas must be reflective of the financial risk associated with the ratemaking capital structure that is measured at book value. Therefore, Value Line betas cannot be used directly in the CAPM, unless the cost rate developed using those betas is applied to a capital structure measured with market values. To develop a CAPM cost rate applicable to a book-value capital structure, the Value Line (market value) betas have been unleveraged and re-leveraged for the book value common equity ratios using the Hamada formula,[11] as follows:

$$\beta l = \beta u \, [1 + (1 - t) \, D/E + P/E]$$

ßl = the leveraged beta, ßu = the unleveraged beta, t = income tax rate, D = debt ratio, P = preferred stock ratio, and E = common equity ratio. The betas published by Value Line have been calculated with the market price of stock and are related to the market value capitalization. By using the formula shown above

[11] Robert S. Hamada, "The Effects of the Firm's Capital Structure on the Systematic Risk of Common Stocks;" The Journal of Finance, Vol. 27, No. 2; Papers and Proceedings of the Thirtieth Annual Meeting of the American Finance Association, New Orleans, Louisiana, Dec. 27-29, 1971. (May 1972), pp. 435-52.

and the capital structure ratios measured at market value, the beta would become 0.55 for the Gas Group if it employed no leverage and was 100% equity financed. Those calculations are shown on Schedule 10 under the section labeled "Hamada," who is credited with developing those formulas. With the unleveraged beta as a base, I calculated the leveraged beta of 1.04 for the book value capital structure of the Gas Group.

Q. WHAT RISK-FREE RATE HAVE YOU USED IN THE CAPM?

A. As shown on page 1 of Schedule 14, I provided the historical yields on Treasury notes and bonds. For the twelve months ended February 2022, the average yield on 30-year Treasury bonds was 2.09%. For the six- and three-months ended February 2022, the yields on 30-year Treasury bonds were 2.02% and 2.07%, respectively. During the twelve months ended February 2022, the range of the yields on 30-year Treasury bonds was 1.85% to 2.34%. The low yields that existed during 2020 can be traced to extraordinary events associated with the Covid-19 Pandemic that jolted the capital markets. These events led to the end of the record-setting 128-month economic expansion. As the recession unfolded in February 2020, the FOMC acted to address these disruptions. The FOMC continued to support the money and capital markets during the recovery from the Pandemic. A transition is now taking place that will prospectively produce higher interest rates as the Pandemic nears its end and the FOMC ends it quantitative easing. That program ended in March 2022 and a Fed Funds rate increase of 0.25% occurred at that time. While interest rates have moved up generally, there has been a "flight" to safety in Treasury obligations due to geopolitical turmoil in Europe. A forward-

looking assessment of the capital markets is especially relevant now because the Company's rates will be based on financial conditions in 2023 and beyond. Higher inflation expectations are a contributing factor that points to higher interest rates. Indeed, higher inflation today is revealed by a 5.9% increase in Social Security payments announced on October 13, 2021, which is the largest one-year increase in nearly four decades. The Fed Funds rate is expected to continue to increase from very low levels that existed during the Covid-19 Pandemic. Higher interest rates clearly point to higher capital costs prospectively.

As shown on page 2 of Schedule 14, forecasts published by Blue Chip on March 1, 2022, indicate that the yields on long-term Treasury bonds are expected to be in the range of 2.2% to 3.0% during the next six quarters. The longer-term forecasts described previously show that the yields on 30-year Treasury bonds will average 3.4% from 2023 through 2027 and 3.8% from 2028 to 2032. For the reasons explained previously, forecasts of interest rates should be emphasized at this time in selecting the risk-free rate of return in CAPM. Hence, I have used a 2.75% risk-free rate of return for CAPM purposes, which considers the Blue Chip forecasts.

Q. WHAT MARKET PREMIUM HAVE YOU USED IN THE CAPM?

A. As shown in the lower panel of data presented on Schedule 14, page 2, the market premium is derived from historical data and the forecast returns. For the historically based market premium, I have used the arithmetic mean obtained from the data presented on Schedule 13, page 1. On that schedule, the market return was 12.09% on large stocks during periods of low interest rates. During those periods,

the yield on long-term government bonds was 2.80% when interest rates were low. As such, I carried over to Schedule 14, page 2, the average large common stock returns of 12.09% and the average yield on long-term government bonds of 2.80%. The resulting market premium is 9.29% (12.09% - 2.80%) based on historical data, as shown on Schedule 14, page 2. As also shown on Schedule 14, page 2, I calculated the forecast returns, which show a 13.91% total market return. With this forecast, I calculated a market premium of 11.16% (13.91% - 2.75%) using forecast data. The resulting market premium applicable to the CAPM derived from these sources equals 10.23% (11.16% + 9.29% = 20.45% ÷ 2).

Q. ARE THERE ADJUSTMENTS TO THE CAPM THAT ARE NECESSARY TO FULLY REFLECT THE RATE OF RETURN ON COMMON EQUITY?

A. Yes. The technical literature supports an adjustment relating to the size of the company or portfolio for which the calculation is performed. As the size of a firm decreases, its risk and required return increases. Moreover, in his discussion of the cost of capital, Professor Eugene F. Brigham has indicated that smaller firms have higher capital costs than otherwise similar larger firms. Also, the Fama/French study (see "The Cross-Section of Expected Stock Returns"; The Journal of Finance, June 1992) established that the size of a firm helps explain stock returns. In an October 15, 1995, article in Public Utility Fortnightly, entitled "Equity and the Small-Stock Effect," it was demonstrated that the CAPM could significantly understate the cost of equity according to a company's size. Indeed, it was demonstrated in the SBBI Yearbook that the returns for stocks in lower deciles (i.e., smaller stocks) had returns in excess of those shown by the simple CAPM. To

recognize this fact, I used the mid-cap adjustment of 1.02%, as revealed on page 3 of Schedule 14, for the CAPM calculation. The adjustment here is related to the size of the Gas Group.

Q. WHAT DOES YOUR CAPM ANALYSIS SHOW?

A. Using the 2.75% risk-free rate of return, the leverage adjusted beta of 1.04 for the Gas Group, the 10.23% market premium, the 1.02% size adjustment, and the flotation cost adjustment, the following result is indicated.

	Rf	+	***ß***	***x (Rm-Rf)***	+	***size***	=	***k***	+	***flot.***	=	***K***
Gas Group	2.75%	+	1.04	x (10.23%)	+	1.02%	=	14.41%	+	0.17%	=	14.58%

COMPARABLE EARNINGS APPROACH

Q. WHAT IS THE COMPARABLE EARNINGS APPROACH?

A. The Comparable Earnings approach estimates a fair return on equity by comparing returns realized by non-regulated companies to returns that a public utility with similar risk characteristics would need to realize in order to compete for capital. Because regulation is a substitute for competitively determined prices, the returns realized by non-regulated firms with comparable risks to a public utility provide useful insight into investor expectations for public utility returns. The firms selected for the Comparable Earnings approach should be companies whose prices are not subject to cost-based price ceilings (i.e., non-regulated firms) so that circularity is avoided.

There are two avenues available to implement the Comparable Earnings approach. One method involves the selection of another industry (or industries)

with comparable risks to the public utility in question, and the results for all companies within that industry serve as a benchmark. The second approach requires the selection of parameters that represent similar risk traits for the public utility and the comparable risk companies. Using this approach, the business lines of the comparable companies become unimportant. The latter approach is preferable, because it is more objective, with the further qualification that the comparable risk companies exclude regulated firms in order to avoid the circular reasoning implicit in the use of the achieved earnings/book ratios of other regulated firms. The United States Supreme Court has held that:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties. Bluefield Water Works v. Public Service Commission, 262 U.S. 668 (1923).

It is important to identify the returns earned by firms that compete for capital with a public utility. This can be accomplished by analyzing the returns of non-regulated firms that are subject to the competitive forces of the marketplace.

Q. DID YOU COMPARE THE RESULTS OF YOUR DCF AND CAPM ANALYSES TO THE RESULTS INDICATED BY A COMPARABLE EARNINGS APPROACH?

A. Yes. I selected companies from The Value Line Investment Survey for Windows that have six categories of comparability designed to reflect the risk of the Gas Group. These screening criteria were based upon the range as defined by the rankings of the companies in the Gas Group. The items considered were Timeliness Rank, Safety Rank, Financial Strength, Price Stability, Value Line betas, and Technical Rank. The definition for these parameters is provided on Schedule 15, page 3. The identities of the companies comprising the Comparable Earnings group and their associated rankings within the ranges are identified on Schedule 15, page 1.

I relied upon Value Line data because it provides a comprehensive basis for evaluating the risks of the comparable firms. As to the returns calculated by Value Line for these companies, there is some downward bias in the figures shown on Schedule 15, page 2, because Value Line computes the returns on year-end rather than average book value. If average book values had been employed, the rates of return would have been slightly higher. Nevertheless, these are the returns considered by investors when taking positions in these stocks. Because many of the comparability factors, as well as the published returns, are used by investors in selecting stocks, and the fact that investors rely on the Value Line service to gauge returns, it is an appropriate database for measuring comparable return opportunities.

Q. WHAT DATA DID YOU CONSIDER IN YOUR COMPARABLE EARNINGS ANALYSIS?

A. I used both historical realized returns and forecasted returns for non-utility companies. As noted previously, I have not used returns for utility companies in order to avoid the circularity that arises from using regulatory-influenced returns to determine a regulated return. It is appropriate to consider a relatively long measurement period in the Comparable Earnings approach in order to cover conditions over an entire business cycle. A ten-year period (five historical years and five projected years) is sufficient to cover an average business cycle. Unlike the DCF and CAPM, the results of the Comparable Earnings method can be applied directly to the book value capitalization. In other words, the Comparable Earnings approach does not contain the potential misspecification contained in market models when the market capitalization and book value capitalization diverge significantly. A point of demarcation was chosen to eliminate the results of highly profitable enterprises, which the Bluefield case stated were not the type of returns that a utility was entitled to earn. For this purpose, I used 20% as the point where those returns could be viewed as highly profitable and should be excluded from the Comparable Earnings approach. The average historical rate of return on book common equity was 11.5% using only the returns that were less than 20%, as shown on Schedule 15, page 2. The average forecasted rate of return as published by Value Line is 12.6% also using values less than 20%, as provided on Schedule 15, page 2. Using the average of these data, my Comparable Earnings result is 12.05%, as shown on Schedule 1, page 2.

CONCLUSION ON COST OF EQUITY

Q. WHAT IS YOUR CONCLUSION REGARDING THE COMPANY'S COST OF COMMON EQUITY?

A. Based upon the application of a variety of methods and models described previously, it is my opinion that a reasonable rate of return on common equity is 10.75% to 11.75% for FPUC and the Florida division of CUC. It is essential that the Commission consider a variety of techniques to measure the Company's cost of equity because of the limitations/infirmities that are inherent in each method. In summary, the Company should be provided an opportunity to realize a 10.75% to 11.75% rate of return on common equity so that it can compete in the capital markets and retain reasonable credit quality.

Q. DOES THIS COMPLETE YOUR DIRECT TESTIMONY?

A. Yes.

APPENDIX A TO DIRECT TESTIMONY OF PAUL R. MOUL

EDUCATIONAL BACKGROUND, BUSINESS EXPERIENCE AND QUALIFICATIONS

I was awarded a degree of Bachelor of Science in Business Administration by Drexel University in 1971. While at Drexel, I participated in the Cooperative Education Program which included employment, for one year, with American Water Works Service Company, Inc., as an internal auditor, where I was involved in the audits of several operating water companies of the American Water Works System and participated in the preparation of annual reports to regulatory agencies and assisted in other general accounting matters.

Upon graduation from Drexel University, I was employed by American Water Works Service Company, Inc., in the Eastern Regional Treasury Department where my duties included preparation of rate case exhibits for submission to regulatory agencies, as well as responsibility for various treasury functions of the thirteen New England operating subsidiaries.

In 1973, I joined the Municipal Financial Services Department of Betz Environmental Engineers, a consulting engineering firm, where I specialized in financial studies for municipal water and wastewater systems.

In 1974, I joined Associated Utility Services, Inc., now known as AUS Consultants. I held various positions with the Utility Services Group of AUS Consultants, concluding my employment there as a Senior Vice President.

In 1994, I formed P. Moul & Associates, an independent financial and regulatory consulting firm. In my capacity as Managing Consultant and for the past forty-two years, I have continuously studied the rate of return requirements for cost of service-regulated

firms. In this regard, I have supervised the preparation of rate of return studies, which were employed, in connection with my testimony and in the past for other individuals. I have presented direct testimony on the subject of fair rate of return, evaluated rate of return testimony of other witnesses, and presented rebuttal testimony.

My studies and prepared direct testimony have been presented before thirty-seven (37) federal, state and municipal regulatory commissions, consisting of: the Federal Energy Regulatory Commission; state public utility commissions in Alabama, Alaska, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, Florida, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Virginia, West Virginia, Wisconsin, and the Philadelphia Gas Commission, and the Texas Commission on Environmental Quality. My testimony has been offered in over 300 rate cases involving electric power, natural gas distribution and transmission, resource recovery, solid waste collection and disposal, telephone, wastewater, and water service utility companies. While my testimony has involved principally fair rate of return and financial matters, I have also testified on capital allocations, capital recovery, cash working capital, income taxes, factoring of accounts receivable, and take-or-pay expense recovery. My testimony has been offered on behalf of municipal and investor-owned public utilities and for the staff of a regulatory commission. I have also testified at an Executive Session of the State of Florida Commission of Investigation concerning the BPU regulation of solid waste collection and disposal.

I was a co-author of a verified statement submitted to the Interstate Commerce Commission concerning the 1983 Railroad Cost of Capital (Ex Parte No. 452). I was also co-author of comments submitted to the Federal Energy Regulatory Commission regarding the Generic Determination of Rate of Return on Common Equity for Public Utilities in 1985, 1986 and 1987 (Docket Nos. RM85-19-000, RM86-12-000, RM87-35-000 and RM88-25-000). Further, I have been the consultant to the New York Chapter of the National Association of Water Companies, which represented the water utility group in the Proceeding on Motion of the Commission to Consider Financial Regulatory Policies for New York Utilities (Case 91-M-0509). I have also submitted comments to the Federal Energy Regulatory Commission in its Notice of Proposed Rulemaking (Docket No. RM99-2-000) concerning Regional Transmission Organizations and on behalf of the Edison Electric Institute in its intervention in the case of Southern California Edison Company (Docket No. ER97-2355-000). Also, I was a member of the panel of participants at the Technical Conference in Docket No. PL07-2 on the Composition of Proxy Groups for Determining Gas and Oil Pipeline Return on Equity.

In late 1978, I arranged for the private placement of bonds on behalf of an investor-owned public utility. I have assisted in the preparation of a report to the Delaware Public Service Commission relative to the operations of the Lincoln and Ellendale Electric Company. I was also engaged by the Delaware P.S.C. to review and report on the proposed financing and disposition of certain assets of Sussex Shores Water Company (P.S.C. Docket Nos. 24-79 and 47-79). I was a co-author of a Report on Proposed Mandatory Solid Waste Collection Ordinance prepared for the Commission of County Commissioners of Collier County, Florida.

APPENDIX A TO DIRECT TESTIMONY OF PAUL R. MOUL

I have been a consultant to the Bucks County Water and Sewer Authority concerning rates and charges for wholesale contract service with the City of Philadelphia. My municipal consulting experience also included an assignment for Baltimore County, Maryland, regarding the City/County Water Agreement for Metropolitan District customers (Circuit Court for Baltimore County in Case 34/153/87-CSP-2636).

Exhibit No. PRM-1

Florida Public Utilities Company

Docket No. 20220067-GU

Financial Exhibits

To Accompany

The Direct Testimony

Of

Paul R. Moul, Managing Consultant
P. Moul & Associates, Inc.

Florida Public Utilities Company
Index of Schedules

Florida Public Utilities Company
Summary Cost of Capital
Thirteen Month Average at December 31, 2023

Type of Capital	Ratios	Cost Rate Range			Weighted Cost Rate		
		Low	Midpoint	High	Low	Midpoint	High
Long-Term Debt	39.44%	3.46%	3.46%	3.46%	1.36%	1.36%	1.36%
Short-Term Debt	5.51%	3.30%	3.30%	3.30%	0.18%	0.18%	0.18%
Total Debt	44.95%				1.54%	1.54%	1.54%
Common Equity	55.05%	10.75%	11.25%	11.75%	5.92%	6.19%	6.47%
Total	100.00%				7.46%	7.73%	8.01%

Indicated levels of fixed charge coverage assuming that the Company could actually achieve its overall cost of capital:

Pre-tax coverage of interest expense based upon a 21.00% composite federal and state income tax rate

(8.85% ÷ 1.36%)	6.51 x		
(9.20% ÷ 1.36%)		6.76 x	
(9.55% ÷ 1.36%)			7.02 x

Post-tax coverage of interest expense

(7.46% ÷ 1.36%)	5.49 x		
(7.73% ÷ 1.36%)		5.68 x	
(8.01% ÷ 1.36%)			5.89 x

Florida Public Utilities Company
Cost of Equity
as of February 28, 2022

Discounted Cash Flow (DCF)			D_1/P_0 [1]	+	g [2]	+	*lev.* [3]	=	k		
Gas Group			3.45%	+	6.75%	+	1.45%	=	11.65%		
Risk Premium (RP)					I [4]	+	RP [5]	=	k		
Gas Group					4.00%	+	6.75%	=	10.75%		
Capital Asset Pricing Model (CAPM)	Rf [6]	+	$ß$ [7]	x (	$Rm-Rf$ [8]	) +	*size* [9]	=	k		
Gas Group	2.75%	+	1.04	x (	10.23%	) +	1.02%	=	14.41%		
Comparable Earnings (CE) [10]					***Historical***		***Forecast***		***Average***		
Comparable Earnings Group					11.5%		12.6%		12.05%		

References:
[1] Schedule 07
[2] Schedule 09
[3] Schedule 10
[4] A-rated public utility bond yield comprised of a 2.75% risk-free rate of return (Schedule 14 page 2) and a yield spread of 1.25% (Schedule 12 page 3)
[5] Schedule 13 page 1
[6] Schedule 14 page 2
[7] Schedule 10
[8] Schedule 14 page 2
[9] Schedule 14 page 3
[10] Schedule 15 page 2

Chesapeake Utilities Corporation
Capitalization and Financial Statistics
2017-2021, Inclusive

	2021	2020	2019	2018	2017	
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 1,340.7	$ 1,222.0	$ 1,053.6	$ 853.1	$ 697.4	
Short-Term Debt	$ 221.6	$ 175.6	$ 247.4	$ 294.5	$ 251.0	
Total Capital	$ 1,562.3	$ 1,397.7	$ 1,301.0	$ 1,147.6	$ 948.4	
Market-Based Financial Ratios						Average
Price-Earnings Multiple	26 x	21 x	24 x	23 x	21 x	23 x
Market/Book Ratio	293.3%	243.9%	267.4%	260.2%	261.5%	265.3%
Dividend Yield	1.5%	1.9%	1.8%	1.8%	1.7%	1.7%
Dividend Payout Ratio	40.0%	41.2%	42.8%	41.7%	36.2%	40.4%
Capital Structure Ratios						
Based on Permanent Captial:						
Long-Term Debt	42.4%	42.7%	46.1%	38.4%	29.7%	39.9%
Common Equity [1]	57.6%	57.3%	53.9%	61.6%	70.3%	60.1%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt incl. Short Term	50.5%	49.9%	56.4%	54.2%	48.3%	51.9%
Common Equity [1]	49.5%	50.1%	43.6%	45.8%	51.7%	48.1%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [1]	11.3%	11.1%	11.2%	11.1%	12.3%	11.4%
Operating Ratio [2]	77.0%	76.9%	77.8%	86.8%	86.1%	80.9%
Coverage incl. AFUDC [3]						
Pre-tax: All Interest Charges	6.60 x	5.33 x	4.70 x	5.72 x	6.73 x	5.82 x
Post-tax: All Interest Charges	5.15 x	4.25 x	3.75 x	4.44 x	5.60 x	4.64 x
Coverage excl. AFUDC [3]						
Pre-tax: All Interest Charges	6.58 x	5.29 x	4.67 x	5.61 x	6.73 x	5.78 x
Post-tax: All Interest Charges	5.13 x	4.21 x	3.72 x	4.33 x	5.60 x	4.60 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	0.5%	1.0%	1.1%	3.4%	0.0%	1.2%
Effective Income Tax Rate	25.9%	25.0%	25.6%	27.1%	19.8%	24.7%
Internal Cash Generation/Construction [4]	78.6%	80.9%	61.1%	42.5%	56.7%	64.0%
Gross Cash Flow/ Avg. Total Debt [5]	24.0%	22.5%	20.3%	25.3%	29.2%	24.3%
Gross Cash Flow Interest Coverage [6]	9.89 x	8.45 x	7.26 x	9.34 x	10.43 x	9.07 x
Common Dividend Coverage [7]	5.66 x	5.93 x	5.57 x	6.20 x	5.99 x	5.87 x

See Page 2 for Notes.

Chesapeake Utilities Corporation
Capitalization and Financial Statistics
2017-2021, Inclusive

Notes:

(1) Excluding Accumulated Other Comprehensive Income ("OCI") from the equity account.

(2) Total operating expenses, maintenance, depreciation and taxes other than income as a percentage of operating revenues.

(3) Coverage calculations represent the number of times available earnings, both including and excluding AFUDC (allowance for funds used during construction) as reported in its entirety, cover fixed charges.

(4) Internal cash generation/gross construction is the percentage of gross construction expenditures provided by internally-generated funds from operations after payment of all cash dividends divided by gross construction expenditures.

(5) Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less AFUDC) as a percentage of average total debt.

(6) Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) plus interest charges, divided by interest charges.

(7) Common dividend coverage is the relationship of internally-generated funds from operations after payment of preferred stock dividends to common dividends paid.

Source of Information: SEC Form 10-K

Gas Group
Capitalization and Financial Statistics [1]
2017-2021, Inclusive

	2021	2020	2019	2018	2017	Average
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 7,293.8	$ 6,052.7	$ 5,316.3	$ 4,769.0	$ 4,348.5	
Short-Term Debt	$ 577.9	$ 285.2	$ 516.3	$ 527.8	$ 409.2	
Total Capital	$ 7,871.7	$ 6,337.9	$ 5,832.6	$ 5,296.8	$ 4,757.7	
Market-Based Financial Ratios						
Price-Earnings Multiple	21 x	24 x	25 x	20 x	22 x	22 x
Market/Book Ratio	185.7%	188.6%	225.0%	218.5%	224.5%	208.5%
Dividend Yield	3.2%	3.1%	2.5%	2.7%	2.5%	2.8%
Dividend Payout Ratio	65.6%	74.7%	63.9%	52.4%	53.3%	62.0%
Capital Structure Ratios						
Based on Permanent Capital:						
Long-Term Debt	53.5%	48.6%	46.4%	45.4%	46.9%	48.1%
Preferred Stock	2.3%	1.8%	1.7%	1.1%	0.0%	1.4%
Common Equity [2]	44.2%	49.6%	52.0%	53.6%	53.1%	50.5%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt incl. Short Term	58.2%	52.3%	51.4%	51.3%	52.7%	53.1%
Preferred Stock	2.1%	1.7%	1.5%	1.0%	0.0%	1.2%
Common Equity [2]	39.7%	46.1%	47.2%	47.7%	47.4%	45.6%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [2]	9.0%	8.7%	9.0%	11.2%	9.1%	9.4%
Operating Ratio [3]	81.3%	82.7%	83.1%	84.3%	83.1%	82.9%
Coverage incl. AFUDC [4]						
Pre-tax: All Interest Charges	4.88 x	4.18 x	4.02 x	4.02 x	4.76 x	4.37 x
Post-tax: All Interest Charges	4.09 x	3.61 x	3.57 x	3.80 x	3.64 x	3.74 x
Overall Coverage: All Int. & Pfd. Div.	3.99 x	3.57 x	3.52 x	3.80 x	3.64 x	3.70 x
Coverage excl. AFUDC [4]						
Pre-tax: All Interest Charges	4.76 x	4.07 x	3.96 x	3.96 x	4.72 x	4.29 x
Post-tax: All Interest Charges	3.97 x	3.50 x	3.50 x	3.75 x	3.61 x	3.67 x
Overall Coverage: All Int. & Pfd. Div.	3.87 x	3.46 x	3.45 x	3.74 x	3.61 x	3.63 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	4.3%	3.1%	2.5%	1.6%	3.0%	2.9%
Effective Income Tax Rate	20.3%	20.6%	14.3%	17.2%	33.7%	21.2%
Internal Cash Generation/Construction [5]	62.8%	54.8%	52.1%	50.6%	64.1%	56.9%
Gross Cash Flow/ Avg. Total Debt [6]	17.4%	19.1%	19.8%	20.1%	22.9%	19.9%
Gross Cash Flow Interest Coverage [7]	8.34 x	7.35 x	6.67 x	6.67 x	7.12 x	7.23 x
Common Dividend Coverage [8]	4.22 x	3.96 x	4.10 x	3.93 x	4.55 x	4.15 x

See Page 2 for Notes.

Gas Group
Capitalization and Financial Statistics
2017-2021, Inclusive

Notes:

(1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group.
(2) Excluding Accumulated Other Comprehensive Income ("OCI") from the equity account.
(3) Total operating expenses, maintenance, depreciation and taxes other than income taxes as a percent of operating revenues.
(4) Coverage calculations represent the number of times available earnings, both including and excluding AFUDC (allowance for funds used during construction) as reported in its entirety, cover fixed charges.
(5) Internal cash generation/gross construction is the percentage of gross construction expenditures provided by internally-generated funds from operations after payment of all cash dividends divided by gross construction expenditures.
(6) Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) plus interest charges, divided by interest charges.
(7) Gross Cash Flow plus interest charges divided by interest charges.
(8) Common dividend coverage is the relationship of internally-generated funds from operations after payment of preferred stock dividends to common dividends paid.

Basis of Selection:
The Gas Group includes companies that are contained in The Value Line Investment Survey within the industry group "Natural Gas Utility," they are not currently the target of a publicly-announced merger or acquisition (i.e., South Jersey Industries), and after eliminating UGI Corp. due to its highly diversified businesses.

		Corporate Credit Ratings		Stock	Value Line
Ticker	Company	Moody's	S&P	Traded	Beta
ATO	Atmos Energy Corp.	A1	A-	NYSE	0.80
CPK	Chesapeake Utilities Corp.	NAIC "2b"		NYSE	0.80
NJR	New Jersey Resources Corp.	A1	-	NYSE	1.00
NI	NiSource Inc.	Baa2	BBB+	NYSE	0.85
NWN	Northwest Natural Holding Compa	Baa1	A+	NYSE	0.80
OGS	ONE Gas, Inc.	A3	BBB+	NYSE	0.80
SWX	Southwest Gas Holdings, Inc.	Baa1	A-	NYSE	0.95
SR	Spire, Inc.	A1	A-	NYSE	0.85
	Average	A3	A-		0.86

Note: Ratings are those of utility subsidiaries

Source of Information:
Annual Reports to Shareholders
Utility COMPUSTAT
Moody's Investors Service
Standard & Poor's Corporation

Standard & Poor's Public Utilities
Capitalization and Financial Statistics [1]
2017-2021, Inclusive

	2021	2020	2019	2018	2017	
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 40,154.3	$ 38,732.9	$ 36,461.6	$ 32,871.6	$ 30,827.6	
Short-Term Debt	$ 1,397.4	$ 1,154.1	$ 1,221.9	$ 1,420.3	$ 1,076.1	
Total Capital	$ 41,551.7	$ 39,887.0	$ 37,683.5	$ 34,291.9	$ 31,903.7	
Market-Based Financial Ratios						Average
Price-Earnings Multiple	22 x	23 x	20 x	21 x	20 x	21 x
Market/Book Ratio	219.9%	218.2%	220.9%	204.4%	214.4%	215.6%
Dividend Yield	3.5%	3.6%	3.2%	3.5%	3.3%	3.4%
Dividend Payout Ratio	72.9%	78.0%	62.7%	68.7%	65.2%	69.5%
Capital Structure Ratios						
Based on Permanent Captial:						
Long-Term Debt	57.4%	58.1%	56.7%	55.0%	56.8%	56.8%
Preferred Stock	2.3%	2.6%	2.4%	2.5%	1.4%	2.2%
Common Equity [2]	40.4%	39.4%	41.0%	42.5%	41.8%	41.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt incl. Short Term	58.9%	59.4%	58.1%	57.0%	58.4%	58.3%
Preferred Stock	2.2%	2.5%	2.3%	2.4%	1.4%	2.1%
Common Equity [2]	38.9%	38.1%	39.6%	40.7%	40.3%	39.5%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [2]	9.4%	10.2%	10.3%	10.3%	9.4%	9.9%
Operating Ratio [3]	83.1%	79.8%	79.3%	79.8%	77.0%	79.8%
Coverage incl. AFUDC [4]						
Pre-tax: All Interest Charges	3.16 x	2.80 x	3.05 x	2.94 x	3.42 x	3.07 x
Post-tax: All Interest Charges	2.87 x	2.60 x	3.10 x	2.59 x	2.86 x	2.80 x
Overall Coverage: All Int. & Pfd. Div.	2.81 x	2.55 x	3.04 x	2.55 x	2.84 x	2.76 x
Coverage excl. AFUDC [4]						
Pre-tax: All Interest Charges	3.06 x	2.70 x	2.95 x	2.84 x	3.31 x	2.97 x
Post-tax: All Interest Charges	2.78 x	2.50 x	3.00 x	2.48 x	2.75 x	2.70 x
Overall Coverage: All Int. & Pfd. Div.	2.72 x	2.46 x	2.94 x	2.44 x	2.73 x	2.66 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	7.4%	6.8%	6.0%	7.3%	7.3%	7.0%
Effective Income Tax Rate	10.6%	9.9%	12.2%	19.0%	28.2%	16.0%
Internal Cash Generation/Construction [5]	60.5%	58.6%	65.9%	66.2%	78.7%	66.0%
Gross Cash Flow/ Avg. Total Debt [6]	15.0%	15.9%	17.5%	17.4%	19.9%	17.1%
Gross Cash Flow Interest Coverage [7]	5.17 x	4.90 x	4.97 x	4.98 x	5.57 x	5.12 x
Common Dividend Coverage [8]	3.47 x	3.52 x	5.56 x	4.80 x	4.33 x	4.34 x

See Page 2 for Notes.

Standard & Poor's Public Utilities
Capitalization and Financial Statistics
2017-2021, Inclusive

Notes:

(1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group.
(2) Excluding Accumulated Other Comprehensive Income ("OCI") from the equity account
(3) Total operating expenses, maintenance, depreciation and taxes other than income taxes as a percent of operating revenues.
(4) Coverage calculations represent the number of times available earnings, both including and excluding AFUDC (allowance for funds used during construction) as reported in its entirety, cover fixed charges.
(5) Internal cash generation/gross construction is the percentage of gross construction expenditures provided by internally-generated funds from operations after payment of all cash dividends divided by gross construction expenditures.
(6) Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) as a percentage of average total debt.
(7) Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) plus interest charges, divided by interest charges.
(8) Common dividend coverage is the relationship of internally-generated funds from operations after payment of preferred stock dividends to common dividends paid.

Source of Information: Annual Reports to Shareholders
Utility COMPUSTAT

Standard & Poor's Public Utilities
Company Identities

	Ticker	Credit Rating [1] Moody's	Credit Rating [1] S&P	Common Stock Traded	Value Line Beta
Alliant Energy Corporation	LNT	Baa1	A-	NYSE	0.85
Ameren Corporation	AEE	Baa1	BBB+	NYSE	0.80
American Electric Power	AEP	Baa1	A-	NYSE	0.75
American Water Works	AWK	Baa1	A	NYSE	0.85
CenterPoint Energy	CNP	Baa1	BBB+	NYSE	1.15
CMS Energy	CMS	A3	A-	NYSE	0.80
Consolidated Edison	ED	Baa1	A-	NYSE	0.75
Dominion Energy	D	A2	BBB+	NYSE	0.85
DTE Energy Co.	DTE	A2	A-	NYSE	0.95
Duke Energy	DUK	A2	BBB+	NYSE	0.85
Edison Int'l	EIX	Baa2	BBB	NYSE	0.95
Entergy Corp.	ETR	Baa1	BBB+	NYSE	0.95
Evergy, Inc.	EVRG	Baa1	A-	NYSE	0.95
Eversource	ES	A3	A	NYSE	0.90
Exelon Corp.	EXC	A2	BBB+	NYSE	0.95
FirstEnergy Corp.	FE	A3	BBB	NYSE	0.85
NextEra Energy Inc.	NEE	A1	A	NYSE	0.90
NiSource Inc.	NI	Baa2	BBB+	NYSE	0.85
NRG Energy Inc.	NRG	Ba1	BB+	NYSE	1.15
Pinnacle West Capital	PNW	A3	BBB+	NYSE	0.90
PPL Corp.	PPL	A3	A-	NYSE	1.10
Public Serv. Enterprise Inc.	PEG	A3	A-	NYSE	0.90
Sempra Energy	SRE	A3	BBB+	NYSE	0.95
Southern Co.	SO	Baa1	BBB+	NYSE	0.95
WEC Energy Corp.	WEC	A2	A-	NYSE	0.80
Xcel Energy Inc	XEL	A2	A-	NYSE	0.80
Average for S&P Utilities		A3	BBB+		0.90

Note: [1] Ratings are those of utility subsidiaries

Source of Information: Moody's Investors Service, Inc.
S&P Global Inc.
The Value Line Investment Survey

Chesapeake Utilities Corporation
Thirteen Month Average Capitalization and Related Capital Structure Ratios
Actual at December 31, 2021, Estimated at December 31, 2022, and Estimated at December 31, 2023

	Actual at December 31, 2021			Estimated at December 31, 2022			Estimated at December 31, 2023		
	Amount	Ratios		Amount	Ratios		Amount	Ratios	
	Outstanding	Excl. S-T Debt	Incl. S-T Debt	Outstanding	Excl. S-T Debt	Incl. S-T Debt	Outstanding	Excl. S-T Debt	Incl. S-T Debt
	($000)			($000)			($000)		
Long-Term Debt	$ 520,238	41.32%	36.05%	$ 596,196 (2)	41.93%	37.56%	$ 661,654 (2)	41.74%	39.44%
Common Equity									
Common stock	8,852			10,681			10,836		
Premium on Capital Stock	357,132			390,240 (3)			433,211 (3)		
Retained earnings(1)	372,932			424,667			479,410		
Total Common Equity	738,917	58.68%	51.20%	825,588	58.07%	52.01%	923,458	58.26%	55.05%
Total Permanent Capital	1,259,156	100.00%	87.25%	1,421,784	100.00%	89.57%	1,585,112	100.00%	94.49%
Short-Term Debt	184,024		12.75%	165,552		10.43%	92,381		5.51%
Total Capital	$ 1,443,179		100.00%	$ 1,587,336		100.00%	$ 1,677,493		100.00%

Notes:
(1)Excluding Accumulated Other Comprehensive Income
(2)Reflects changes annually in debt principal amounts of:

5.93% note, due October 31, 2023	$ (3,000)	$ (3,000)
5.68% note, due June 30, 2026	$ (2,900)	$ (2,900)
6.43% note, due May 2, 2028	$ (700)	$ (700)
3.73% note, due December 16, 2028	$ (2,000)	$ (2,000)
3.88% note, due May 15, 2029	$ (5,000)	$ (5,000)
3.25% note, due April 30, 2032	$ (3,500)	$ (7,000)
2.95% notes Due March 15, 2042	$ 50,000	
4.00% notes Due December 1, 2037	$ 80,000	

(3)Reflects Additional Equity $ 44,339 $ 40,469

Source of Information: Company provided data

Chesapeake Utilities Corporation
Calculation of the Embedded Cost of Long-Term Debt
Actual at December 31, 2021

Series	Principal Amount Outstanding	Percent to Total	Effective Cost Rate [1]	Weighted Cost Rate
5.93% note, due October 31, 2023	$ 7,615	1.46%	5.94%	0.09%
5.68% note, due June 30, 2026	15,838	3.04%	5.69%	0.17%
6.43% note, due May 2, 2028	5,169	0.99%	6.45%	0.06%
3.73% note, due December 16, 2028	15,846	3.05%	3.76%	0.12%
3.88% note, due May 15, 2029	41,923	8.06%	3.91%	0.32%
3.25% note, due April 30, 2032	70,000	13.46%	3.27%	0.44%
2.98% note, due December 20, 2034	70,000	13.46%	3.00%	0.40%
3.00% note, due July 15, 2035	50,000	9.61%	3.02%	0.29%
2.96% note, due August 15, 2035	40,000	7.69%	2.97%	0.23%
3.48% note, due May 31, 2038	50,000	9.61%	3.49%	0.34%
3.58% note, due November 30, 2038	50,000	9.61%	3.59%	0.35%
3.98% note, due August 20, 2039	100,000	19.22%	3.99%	0.77%
2.49% notes Due January 25, 2037	3,846	0.74%	2.51%	0.02%
2.95% notes Due March 15, 2042	-	0.00%	2.96%	0.00%
4.00% notes Due December 1, 2037	-	0.00%	4.01%	0.00%
Total	$ 520,238	100.00%		3.58%

Notes:
[1] As calculated on page 4 of this schedule.

Source of Information: Company provided data

Chesapeake Utilities Corporation
Calculation of the Embedded Cost of Long-Term Debt
Estimated at December 31, 2022

Series	Principal Amount Outstanding	Percent to Total	Effective Cost Rate [1]	Weighted Cost Rate
5.93% note, due October 31, 2023	$ 4,615	0.77%	5.94%	0.05%
5.68% note, due June 30, 2026	12,938	2.17%	5.69%	0.12%
6.43% note, due May 2, 2028	4,469	0.75%	6.45%	0.05%
3.73% note, due December 16, 2028	13,846	2.32%	3.76%	0.09%
3.88% note, due May 15, 2029	36,923	6.19%	3.91%	0.24%
3.25% note, due April 30, 2032	68,788	11.54%	3.27%	0.38%
2.98% note, due December 20, 2034	70,000	11.74%	3.00%	0.35%
3.00% note, due July 15, 2035	50,000	8.39%	3.02%	0.25%
2.96% note, due August 15, 2035	40,000	6.71%	2.97%	0.20%
3.48% note, due May 31, 2038	50,000	8.39%	3.49%	0.29%
3.58% note, due November 30, 2038	50,000	8.39%	3.59%	0.30%
3.98% note, due August 20, 2039	100,000	16.77%	3.99%	0.67%
2.49% notes Due January 25, 2037	50,000	8.39%	2.51%	0.21%
2.95% notes Due March 15, 2042	38,462	6.45%	2.96%	0.19%
4.00% notes Due December 1, 2037	6,154	1.03%	4.01%	0.04%
Total	$ 596,196	100.00%		3.43%

Note:
[1] As calculated on page 4 of this schedule.

Source of Information: Company provided data

Chesapeake Utilities Corporation
Calculation of the Embedded Cost of Long-Term Debt
Estimated at December 31, 2023

Series	Principal Amount Outstanding	Percent to Total	Effective Cost Rate [1]	Weighted Cost Rate
5.93% note, due October 31, 2023	$ 1,615	0.24%	5.94%	0.01%
5.68% note, due June 30, 2026	10,038	1.52%	5.69%	0.09%
6.43% note, due May 2, 2028	3,769	0.57%	6.45%	0.04%
3.73% note, due December 16, 2028	11,846	1.79%	3.76%	0.07%
3.88% note, due May 15, 2029	31,923	4.83%	3.91%	0.19%
3.25% note, due April 30, 2032	62,462	9.44%	3.27%	0.31%
2.98% note, due December 20, 2034	70,000	10.58%	3.00%	0.32%
3.00% note, due July 15, 2035	50,000	7.56%	3.02%	0.23%
2.96% note, due August 15, 2035	40,000	6.05%	2.97%	0.18%
3.48% note, due May 31, 2038	50,000	7.56%	3.49%	0.26%
3.58% note, due November 30, 2038	50,000	7.56%	3.59%	0.27%
3.98% note, due August 20, 2039	100,000	15.11%	3.99%	0.60%
2.49% notes Due January 25, 2037	50,000	7.56%	2.51%	0.19%
2.95% notes Due March 15, 2042	50,000	7.56%	2.96%	0.22%
4.00% notes Due December 1, 2037	80,000	12.09%	4.01%	0.49%
Total	$ 661,654	100.00%		3.46%

Note:
[1] As calculated on page 4 of this schedule.

Source of Information: Company provided data

Chesapeake Utilities Corporation
Calculation of the Effective Cost of Long-Term Debt by Series

Series	Coupon Rate	Date of Issue	Date of Maturity	Principal Amount Issued	Discount and Expense	Net Proceeds	Net Proceeds Ratio	Effective Cost Rate [1]
5.93% note, due October 31, 2023	5.93%	10/31/08	10/31/23	$ 30,000,000	$ 39,518	$ 29,960,482	99.87%	5.94%
5.68% note, due June 30, 2026	5.68%	06/24/11	06/30/26	29,000,000	34,794	28,965,206	99.88%	5.69%
6.43% note, due May 2, 2028	6.43%	05/02/13	05/02/28	7,000,000	12,789	6,987,211	99.82%	6.45%
3.73% note, due December 16, 2028	3.73%	12/16/13	12/16/28	20,000,000	68,794	19,931,206	99.66%	3.76%
3.88% note, due May 15, 2029	3.88%	05/15/14	05/15/29	50,000,000	192,790	49,807,210	99.61%	3.91%
3.25% note, due April 30, 2032	3.25%	04/21/17	04/30/32	70,000,000	150,539	69,849,461	99.78%	3.27%
2.98% note, due December 20, 2034	2.98%	12/20/19	12/20/34	70,000,000	165,643	69,834,357	99.76%	3.00%
3.00% note, due July 15, 2035	3.00%	07/15/20	07/15/35	50,000,000	92,476	49,907,524	99.82%	3.02%
2.96% note, due August 15, 2035	2.96%	08/14/20	08/15/35	40,000,000	72,953	39,927,047	99.82%	2.97%
3.48% note, due May 31, 2038	3.48%	05/15/18	05/31/38	50,000,000	99,400	49,900,600	99.80%	3.49%
3.58% note, due November 30, 2038	3.58%	11/15/18	11/30/38	50,000,000	95,036	49,904,964	99.81%	3.59%
3.98% note, due August 20, 2039	3.98%	08/12/19	08/20/39	100,000,000	167,966	99,832,034	99.83%	3.99%
2.49% notes Due January 25, 2037	2.49%	12/20/21	01/25/37	50,000,000	126,950	49,873,050	99.75%	2.51%
2.95% notes Due March 15, 2042	2.95%	03/15/22	03/15/42	50,000,000	93,011	49,906,989	99.81%	2.96%
4.00% notes Due December 1, 203[illegible] [2]	4.00%	12/01/22	12/01/37	80,000,000	131,000	79,869,000	99.84%	4.01%

Notes: [1] The effective cost for each issue is the internal rate of return ("irr") using as inputs the term of the issue, the coupon rate, the annual sinking fund payments, and the net proceeds.
[2] Projected

Source of Information: Company provided data

Monthly Dividend Yields for
Natural Gas Group
for the Twelve Months Ending February 2022

Company	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	12-Month Average	6-Month Average	3-Month Average
Atmos Energy Corp (ATO)	2.54%	2.42%	2.52%	2.61%	2.55%	2.57%	2.84%	2.97%	3.01%	2.60%	2.55%	2.48%			
Chesapeake Utilities Corp (CPK)	1.52%	1.62%	1.68%	1.60%	1.54%	1.47%	1.60%	1.47%	1.51%	1.32%	1.41%	1.45%			
New Jersey Resources Corporation (NJR)	3.34%	3.18%	3.13%	3.37%	3.78%	3.92%	4.17%	3.85%	3.97%	3.54%	3.62%	3.35%			
NiSource Inc (NI)	3.67%	3.38%	3.46%	3.61%	3.55%	3.58%	3.65%	3.57%	3.60%	3.21%	3.22%	3.26%			
Northwest Natural Holding Company (NWN)	3.58%	3.56%	3.64%	3.68%	3.67%	3.74%	4.21%	4.28%	4.49%	3.98%	4.08%	3.72%			
ONE Gas Inc (OGS)	3.03%	2.90%	3.13%	3.14%	3.17%	3.24%	3.68%	3.47%	3.58%	3.00%	3.21%	2.99%			
Southwest Gas Holdings Inc (SWX)	3.33%	3.44%	3.61%	3.61%	3.43%	3.39%	3.58%	3.46%	3.62%	3.41%	3.52%	3.36%			
Spire Inc. (SR)	3.53%	3.47%	3.66%	3.60%	3.68%	3.93%	4.26%	4.39%	4.63%	4.21%	4.18%	4.12%			
Average	**3.07%**	**3.00%**	**3.10%**	**3.15%**	**3.17%**	**3.23%**	**3.50%**	**3.43%**	**3.55%**	**3.16%**	**3.22%**	**3.09%**	**3.22%**	**3.33%**	**3.16%**

Note: Monthly dividend yields are calculated by dividing the annualized quarterly dividend by the month-end closing stock price adjusted by the fraction of the ex-dividend.

Source of Information: https://finance.yahoo.com/quote
https://www.nasdaq.com/market-activity/stocks

Forward-looking Dividend Yield

1/2 Growth	D_0/P_0	(.5g)	D_1/P_0	
	3.33%	1.033750	3.44%	
Discrete	D_0/P_0	Adj.	D_1/P_0	
	3.33%	1.041843	3.47%	
Quarterly	D_0/P_0	Adj.	D_1/P_0	
	0.8325%	1.016464	3.43%	
Average			3.45%	
Growth rate			6.75%	
K			10.20%	

$$K = \frac{D_0(1+g)^0 + D_0(1+g)^0 + D_0(1+g)^1 + D_0(1+g)^1}{P_0} + g$$

$$K = \frac{D_0(1+g)^{.25} + D_0(1+g)^{.50} + D_0(1+g)^{.75} + D_0(1+g)^{1.00}}{P_0} + g$$

$$K = \left[\left(1 + \frac{D_0(1+g)^{.25}}{P_0}\right)^4 - 1\right] + g$$

Historical Growth Rates
Earnings Per Share, Dividends Per Share,
Book Value Per Share, and Cash Flow Per Share

Gas Group	Earnings per Share		Dividends per Share		Book Value per Share		Cash Flow per Share	
	Value Line		Value Line		Value Line		Value Line	
	5 Year	10 Year	5 Year	10 Year	5 Year	10 Year	5 Year	10 Year
Atmos Energy Corp (ATO)	8.50%	8.50%	8.00%	5.50%	11.00%	8.50%	7.00%	6.00%
Chesapeake Utilities Corp (CPK)	9.00%	9.50%	7.50%	6.50%	11.00%	9.50%	7.50%	9.50%
New Jersey Resources Corporation (NJR)	2.50%	5.00%	6.50%	6.50%	7.00%	7.50%	4.50%	7.00%
NiSource Inc (NI)	0.50%	2.00%	-3.00%	-1.50%	-5.00%	-3.00%	-	-0.50%
Northwest Natural Holding Company (NWN)	1.50%	-1.50%	0.50%	1.50%	-	1.00%	1.50%	0.50%
ONE Gas Inc (OGS)	10.00%	-	14.50%	-	3.00%	-	8.00%	-
Southwest Gas Holdings Inc (SWX)	5.50%	7.50%	8.00%	8.50%	7.00%	6.00%	1.50%	4.00%
Spire Inc. (SR)	2.50%	2.00%	6.00%	4.50%	4.50%	6.50%	6.00%	5.00%
Average	5.00%	4.71%	6.00%	4.50%	5.50%	5.14%	5.14%	4.50%

Source of Information: Value Line Investment Survey, February 25, 2021

Analysts' Five-Year Projected Growth Rates
Earnings Per Share, Dividends Per Share,
Book Value Per Share, and Cash Flow Per Share

Gas Group	I/B/E/S First Call	Zacks	Value Line Earnings Per Share	Value Line Dividends Per Share	Value Line Book Value Per Share	Value Line Cash Flow Per Share	Value Line Percent Retained to Common Equity
Atmos Energy Corp (ATO)	7.25%	7.30%	7.50%	7.00%	7.50%	7.00%	4.50%
Chesapeake Utilities Corp (CPK)	4.74%	NA	8.00%	8.00%	7.00%	9.00%	7.00%
New Jersey Resources Corporation	6.00%	7.10%	4.50%	5.00%	4.00%	4.50%	4.50%
NiSource Inc (NI)	3.52%	6.70%	10.50%	4.50%	5.00%	6.00%	6.50%
Northwest Natural Holding Compan	5.90%	5.10%	6.00%	0.50%	5.50%	4.50%	3.00%
ONE Gas Inc (OGS)	2.90%	5.00%	6.00%	6.50%	8.50%	6.50%	3.00%
Southwest Gas Holdings Inc (SWX)	4.00%	5.50%	8.00%	5.00%	6.00%	8.00%	5.00%
Spire Inc. (SR)	4.30%	5.30%	9.00%	5.00%	7.00%	7.50%	3.00%
Average	4.83%	6.00%	7.44%	5.19%	6.31%	6.63%	4.56%

Source of Information :
Yahoo Finance, February 16, 2022
Zacks, February 16, 2022
Value Line Investment Survey, February 25, 2021

Gas Group
Financial Risk Adjustment

	ATMOS Energy (NYSE:ATO)	Chesapeake Utilities (NYSE:CPK)	New Jersey Resources (NYSE:NJR)	NiSource, Inc (NYSE:NI)	Northwest Natural Gas (NYSE:NWN)	ONE Gas Inc (NYSE:OGS)	Southwest Gas (SWX)	Spire Inc. (NYSESR)	Average
Fiscal Year	09/30/21	12/31/21	09/30/21	12/31/21	12/31/21	12/31/21	12/31/21	09/30/21	
Capitalization at Fair Values									
Debt(D)	8,086,136	597,200	2,288,544	10,415,700	1,174,500	2,000,000	4,663,332	3,375,900	4,075,164
Preferred(P)	0	0	0	0	0	0	0	242,000	30,250
Equity(E)	11,679,422	2,574,335	3,305,117	11,190,416	1,518,473	4,161,401	4,232,567	3,162,081	5,227,977
Total	19,765,558	3,171,535	5,593,661	21,606,116	2,692,973	6,161,401	8,895,899	6,779,981	9,333,391
Capital Structure Ratios									
Debt(D)	40.91%	18.83%	40.91%	48.21%	43.61%	32.46%	52.42%	49.79%	40.89%
Preferred(P)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.57%	0.45%
Equity(E)	59.09%	81.17%	59.09%	51.79%	56.39%	67.54%	47.58%	46.64%	58.66%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Common Stock									
Issued	132,419.754	17,655.410	95,709.662	405,303.023	31,129.000	53,633.210	60,422.081	51,684.883	
Treasury	0.000	0.000	762.313	0.000	0.000	0.000	0.000	0.000	
Outstanding	132,419.754	17,655.410	94,947.349	405,303.023	31,129.000	53,633.210	60,422.081	51,684.883	
Market Price	$ 88.20	$ 145.81	$ 34.81	$ 27.61	$ 48.78	$ 77.59	$ 70.05	$ 61.18	
Capitalization at Carrying Amounts									
Debt(D)	7,360,000	568,800	2,102,845	9,241,500	1,044,932	1,600,000	4,413,008	2,994,900	3,665,748
Preferred(P)	0	0	0	1,546,500	0	0	0	242,000	223,563
Equity(E)	7,906,889	774,130	1,630,862	5,400,800	935,146	2,349,532	2,953,820	2,416,200	3,045,922
Total	15,266,889	1,342,930	3,733,707	16,188,800	1,980,078	3,949,532	7,366,828	5,653,100	6,935,233
Capital Structure Ratios									
Debt(D)	48.21%	42.36%	56.32%	57.09%	52.77%	40.51%	59.90%	52.98%	51.27%
Preferred(P)	0.00%	0.00%	0.00%	9.55%	0.00%	0.00%	0.00%	4.28%	1.73%
Equity(E)	51.79%	57.64%	43.68%	33.36%	47.23%	59.49%	40.10%	42.74%	47.00%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Betas Value Line	0.80	0.80	1.00	0.85	0.80	0.80	0.95	0.85	0.86

Hamada

Bl	=	Bu	[1+	(1 - t)	D/E	+	P/E	]
0.86	=	Bu	[1+	(1-0.21)	0.6971	+	0.0077	]
0.86	=	Bu	[1+	0.79	0.6971	+	0.0077	]
0.86	=	Bu	1.5584					
0.55	=	Bu						

Hamada

Bl	=	0.55	[1+	(1 - t)	D/E	+	P/E	]
Bl	=	0.55	[1+	0.79	1.0907	+	0.0368	]
Bl	=	0.55	1.8985					
Bl	=	1.04						

M&M

ku	=	ke	-	(((	ku	-	i	)		1-t	)	D	/	E	-	(ku	-	d	)	P	/	E
7.70%	=	10.20%	-	(((	7.70%	-	3.20%	)		0.79	)	40.89%	/	58.66%	-	7.70%	-	5.68%	)	0.45%	/	58.66%
7.70%	=	10.20%	-	(((	4.50%			)		0.79	)	0.6971			-	2.02%			)	0.0077		
7.70%	=	10.20%	-	((	3.56%						)	0.6971			-	2.02%			)	0.0077		
7.70%	=	10.20%	-		2.48%										-	0.02%						

M&M

ke	=	ku	+	(((	ku	-	i	)		1-t	)	D	/	E	+	(ku	-	d	)	P	/	E
11.65%	=	7.70%	+	(((	7.70%	-	3.20%	)		0.79	)	51.27%	/	47.00%	+	7.70%	-	5.68%	)	1.73%	/	47.00%
11.65%	=	7.70%	+	(((	4.50%			)		0.79	)	1.0907			+	2.02%			)	0.0368		
11.65%	=	7.70%	+	((	3.56%						)	1.0907			+	2.02%			)	0.0368		
11.65%	=	7.70%	+		3.88%										+	0.07%						

Analysis of Public Offerings of Gas Distribution Company Common Stock

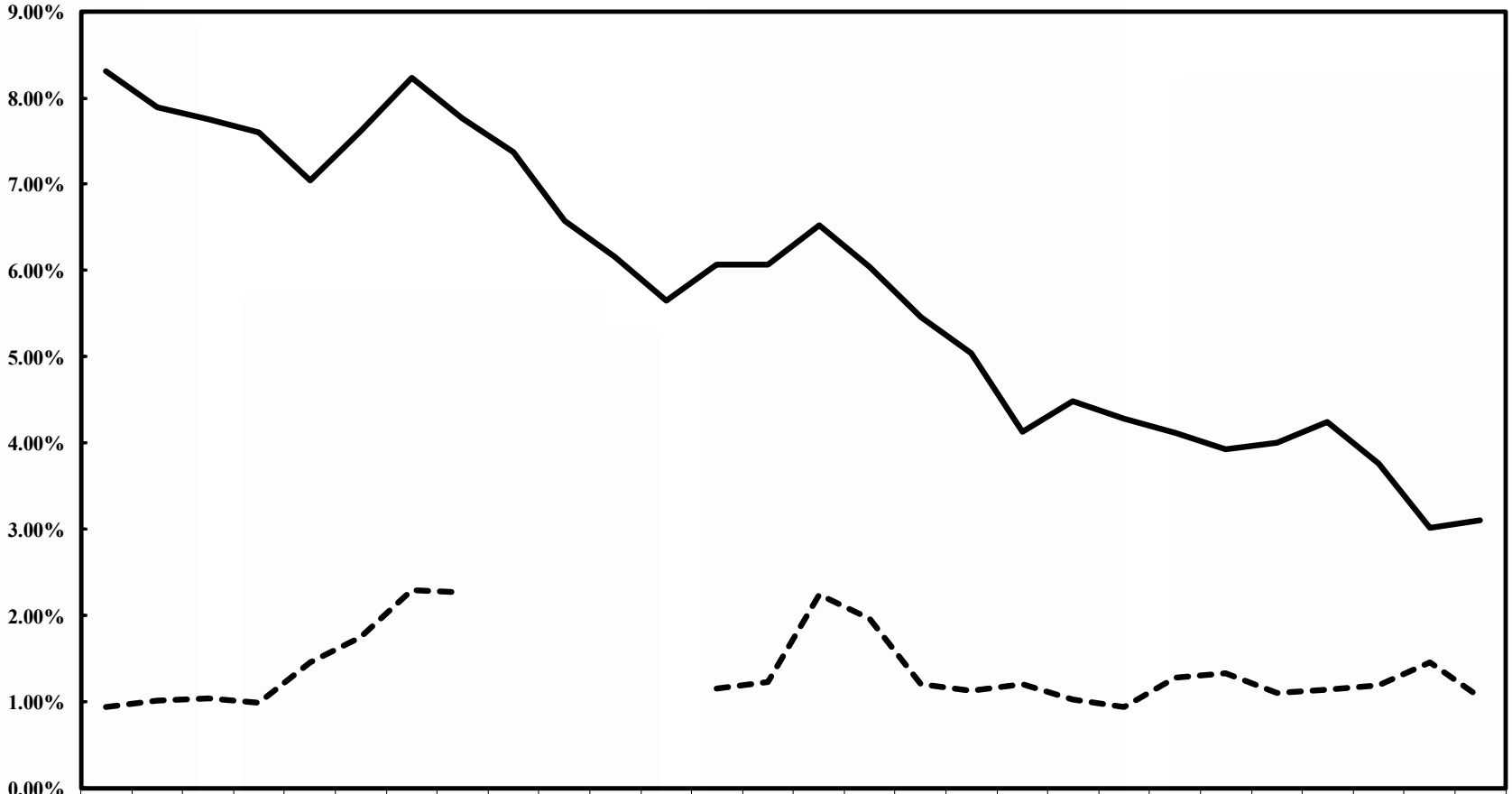
Company	Date of Offering	No. of shares offered	Dollar amount of offering	Price to public	Underwriters' discount and commission	Gross Proceeds per share	Estimated company issuance expenses	Net proceeds per share	Percent of offering price: Underwriters' discount and commission	Percent of offering price: Estimated company issuance expenses	Percent of offering price: Total Issuance and selling expense
New Jersey Resources Corp.	12/04/19	5,700,000	$ 235,125,000	$41.00	$1.2375	$39.763	$0.088	$39.675	3.0%	0.2%	3.2%
Northwest Natural Gas Company	06/04/19	1,250,000	$ 83,750,000	$67.00	$2.1775	$64.823	$0.320	$64.503	3.3%	0.5%	3.8%
Atmos Energy Corporation	12/3/018	7,008,000	$ 650,000,000	$92.75	$0.9769	$91.773	$0.143	$91.630	1.1%	0.2%	1.3%
Southwest Gas Holkings	11/30/18	3,100,000	$ 234,050,000	$75.50	$2.5481	$72.952	$0.194	$72.758	3.4%	0.3%	3.7%
South Jersey Industries, Inc.	04/18/18	11,018,000	$ 325,029,000	$29.50	$1.0325	$28.468	$0.064	$28.404	3.5%	0.2%	3.7%
Spire, Inc.	04/07/18	2,000,000	$ 137,500,000	$68.75	$2.1094	$66.641	$0.500	$66.141	3.1%	0.7%	3.8%
Atmos Energy Corporation	11/28/17	7,008,087	$ 650,000,069	$92.75	$0.9769	$91.773	$0.143	$91.630	1.1%	0.2%	1.3%
Chesapeake Utilities Corp.	09/22/16	835,000	$ 51,987,000	$62.26	$2.3300	$59.930	$0.188	$59.742	3.7%	0.3%	4.0%
Spire, Inc.	05/12/16	1,900,000	$ 1,891,500,000	$63.05	$2.0491	$61.001	$0.158	$60.843	3.2%	0.3%	3.5%
South Jersey Industries, Inc.	05/12/16	7,000,000	$ 49,875,000	$26.50	$0.9188	$25.581	$0.047	$25.534	3.5%	0.2%	3.7%
The Laclede Group, Inc.	06/05/14	9,000,000	$ 585,000,000	$47.19	$1.7110	$45.479	$0.111	$45.368	3.6%	0.2%	3.8%
Atmos Energy Corporation	02/11/14	8,000,000	$ 542,000,000	$44.00	$1.5400	$42.460	$0.044	$42.416	3.5%	0.1%	3.6%
Piedmont Natural Gas Company, Inc.	01/29/13	4,000,000	$ 128,000,000	$32.00	$1.1200	$30.880	$0.088	$30.792	3.5%	0.3%	3.8%
Atmos Energy Corporation	12/07/06	5,500,000	$ 173,250,000	$31.50	$1.1025	$30.398	$0.073	$30.325	3.5%	0.2%	3.7%
AGL Resources Inc.	11/19/04	9,600,000	$ 297,696,000	$31.01	$0.9300	$30.080	$0.042	$30.038	3.0%	0.1%	3.1%
Atmos Energy Corporation	10/21/04	14,000,000	$ 346,500,000	$24.75	$0.9900	$23.760	$0.029	$23.731	4.0%	0.1%	4.1%
Atmos Energy Corporation	07/19/04	8,650,000	$ 214,087,500	$24.75	$0.9900	$23.760	$0.046	$23.714	4.0%	0.2%	4.2%
The Laclede Group, Inc.	05/25/04	1,500,000	$ 40,200,000	$26.80	$0.8710	$25.929	$0.067	$25.862	3.3%	0.3%	3.6%
Northwest Natural Gas Company	03/30/04	1,200,000	$ 37,200,000	$31.00	$1.0100	$29.990	$0.146	$29.844	3.3%	0.5%	3.8%
Piedmont Natural Gas Company, Inc.	01/23/04	4,250,000	$ 180,625,000	$42.50	$1.4900	$41.010	$0.082	$40.928	3.5%	0.2%	3.7%
Atmos Energy Corporation	06/18/03	4,000,000	$ 101,240,000	$25.31	$1.0124	$24.298	$0.095	$24.203	4.0%	0.4%	4.4%
AGL Resources Inc.	02/11/03	5,600,000	$ 123,200,000	$22.00	$0.7700	$21.230	$0.045	$21.185	3.5%	0.2%	3.7%
WGL Holdings, Inc	06/26/01	1,790,000	$ 47,846,700	$26.73	$0.8950	$25.835	$0.031	$25.804	3.3%	0.1%	3.4%
Atmos Energy Corporation	11/07/00	6,000,000	$ 133,500,000	$22.25	$1.1100	$21.140	$0.058	$21.082	5.0%	0.3%	5.3%
Average									3.3%	0.3%	3.6%

Source of Information: SNL Financial and SEC filings

Interest Rates for Investment Grade Public Utility Bonds
Yearly for 2016-2020 and 2021
and the Twelve Months Ended February 2022

Years	Aa Rated	A Rated	Baa Rated	Average
2016	3.73%	3.93%	4.68%	4.11%
2017	3.82%	4.00%	4.38%	4.07%
2018	4.09%	4.25%	4.67%	4.34%
2019	3.61%	3.77%	4.19%	3.86%
2020	2.79%	3.02%	3.39%	3.07%
Five-Year Average	3.61%	3.79%	4.26%	3.89%
2021	2.97%	3.11%	3.36%	3.15%
Months				
Mar-21	3.27%	3.44%	3.72%	3.48%
Apr-21	3.13%	3.30%	3.57%	3.33%
May-21	3.17%	3.33%	3.58%	3.36%
Jun-21	3.01%	3.16%	3.41%	3.19%
Jul-21	2.80%	2.95%	3.20%	2.99%
Aug-21	2.82%	2.95%	3.19%	2.99%
Sep-21	2.84%	2.96%	3.19%	3.00%
Oct-21	2.99%	3.09%	3.32%	3.13%
Nov-21	2.91%	3.02%	3.25%	3.06%
Dec-21	3.01%	3.13%	3.36%	3.17%
Jan-22	3.19%	3.33%	3.57%	3.46%
Feb-22	3.56%	3.68%	3.95%	3.73%
Twelve-Month Average	3.06%	3.20%	3.44%	3.24%
Six-Month Average	3.08%	3.20%	3.44%	3.26%
Three-Month Average	3.25%	3.38%	3.63%	3.45%

Yields on
A-rated Public Utility Bonds and
Spreads over 30-Year Treasuries



	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
A-rated Public Utility	8.31	7.89	7.75	7.60	7.04	7.62	8.24	7.76	7.37	6.58	6.16	5.65	6.07	6.07	6.53	6.04	5.46	5.04	4.13	4.48	4.28	4.12	3.93	4.00	4.25	3.77	3.02	3.11
Spread vs. 30-year	0.94	1.01	1.04	0.99	1.46	1.75	2.30	2.27					1.16	1.23	2.25	1.96	1.21	1.13	1.21	1.03	0.94	1.28	1.33	1.10	1.14	1.19	1.46	1.06

A rated Public Utility Bonds over 30-Year Treasuries

Year	A-rated Public Utility	30-Year Treasuries Yield	30-Year Treasuries Spread
Jan-99	6.97%	5.16%	1.81%
Feb-99	7.09%	5.37%	1.72%
Mar-99	7.26%	5.58%	1.68%
Apr-99	7.22%	5.55%	1.67%
May-99	7.47%	5.81%	1.66%
Jun-99	7.74%	6.04%	1.70%
Jul-99	7.71%	5.98%	1.73%
Aug-99	7.91%	6.07%	1.84%
Sep-99	7.93%	6.07%	1.86%
Oct-99	8.06%	6.26%	1.80%
Nov-99	7.94%	6.15%	1.79%
Dec-99	8.14%	6.35%	1.79%
Jan-00	8.35%	6.63%	1.72%
Feb-00	8.25%	6.23%	2.02%
Mar-00	8.28%	6.05%	2.23%
Apr-00	8.29%	5.85%	2.44%
May-00	8.70%	6.15%	2.55%
Jun-00	8.36%	5.93%	2.43%
Jul-00	8.25%	5.85%	2.40%
Aug-00	8.13%	5.72%	2.41%
Sep-00	8.23%	5.83%	2.40%
Oct-00	8.14%	5.80%	2.34%
Nov-00	8.11%	5.78%	2.33%
Dec-00	7.84%	5.49%	2.35%
Jan-01	7.80%	5.54%	2.26%
Feb-01	7.74%	5.45%	2.29%
Mar-01	7.68%	5.34%	2.34%
Apr-01	7.94%	5.65%	2.29%
May-01	7.99%	5.78%	2.21%
Jun-01	7.85%	5.67%	2.18%
Jul-01	7.78%	5.61%	2.17%
Aug-01	7.59%	5.48%	2.11%
Sep-01	7.75%	5.48%	2.27%
Oct-01	7.63%	5.32%	2.31%
Nov-01	7.57%	5.12%	2.45%
Dec-01	7.83%	5.48%	2.35%
Jan-02	7.66%	5.45%	2.21%
Feb-02	7.54%	5.40%	2.14%
Mar-02	7.76%		
Apr-02	7.57%		
May-02	7.52%		
Jun-02	7.42%		
Jul-02	7.31%		
Aug-02	7.17%		
Sep-02	7.08%		
Oct-02	7.23%		
Nov-02	7.14%		
Dec-02	7.07%		
Jan-03	7.07%		
Feb-03	6.93%		
Mar-03	6.79%		
Apr-03	6.64%		
May-03	6.36%		
Jun-03	6.21%		
Jul-03	6.57%		
Aug-03	6.78%		
Sep-03	6.56%		
Oct-03	6.43%		
Nov-03	6.37%		
Dec-03	6.27%		
Jan-04	6.15%		
Feb-04	6.15%		
Mar-04	5.97%		
Apr-04	6.35%		
May-04	6.62%		
Jun-04	6.46%		
Jul-04	6.27%		
Aug-04	6.14%		
Sep-04	5.98%		
Oct-04	5.94%		
Nov-04	5.97%		
Dec-04	5.92%		

Year	A-rated Public Utility	30-Year Treasuries Yield	30-Year Treasuries Spread
Jan-05	5.78%		
Feb-05	5.61%		
Mar-05	5.83%		
Apr-05	5.64%		
May-05	5.53%		
Jun-05	5.40%		
Jul-05	5.51%		
Aug-05	5.50%		
Sep-05	5.52%		
Oct-05	5.79%		
Nov-05	5.88%		
Dec-05	5.80%		
Jan-06	5.75%		
Feb-06	5.82%	4.54%	1.28%
Mar-06	5.98%	4.73%	1.25%
Apr-06	6.29%	5.06%	1.23%
May-06	6.42%	5.20%	1.22%
Jun-06	6.40%	5.15%	1.25%
Jul-06	6.37%	5.13%	1.24%
Aug-06	6.20%	5.00%	1.20%
Sep-06	6.00%	4.85%	1.15%
Oct-06	5.98%	4.85%	1.13%
Nov-06	5.80%	4.69%	1.11%
Dec-06	5.81%	4.68%	1.13%
Jan-07	5.96%	4.85%	1.11%
Feb-07	5.90%	4.82%	1.08%
Mar-07	5.85%	4.72%	1.13%
Apr-07	5.97%	4.87%	1.10%
May-07	5.99%	4.90%	1.09%
Jun-07	6.30%	5.20%	1.10%
Jul-07	6.25%	5.11%	1.14%
Aug-07	6.24%	4.93%	1.31%
Sep-07	6.18%	4.79%	1.39%
Oct-07	6.11%	4.77%	1.34%
Nov-07	5.97%	4.52%	1.45%
Dec-07	6.16%	4.53%	1.63%
Jan-08	6.02%	4.33%	1.69%
Feb-08	6.21%	4.52%	1.69%
Mar-08	6.21%	4.39%	1.82%
Apr-08	6.29%	4.44%	1.85%
May-08	6.28%	4.60%	1.68%
Jun-08	6.38%	4.69%	1.69%
Jul-08	6.40%	4.57%	1.83%
Aug-08	6.37%	4.50%	1.87%
Sep-08	6.49%	4.27%	2.22%
Oct-08	7.56%	4.17%	3.39%
Nov-08	7.60%	4.00%	3.60%
Dec-08	6.52%	2.87%	3.65%
Jan-09	6.39%	3.13%	3.26%
Feb-09	6.30%	3.59%	2.71%
Mar-09	6.42%	3.64%	2.78%
Apr-09	6.48%	3.76%	2.72%
May-09	6.49%	4.23%	2.26%
Jun-09	6.20%	4.52%	1.68%
Jul-09	5.97%	4.41%	1.56%
Aug-09	5.71%	4.37%	1.34%
Sep-09	5.53%	4.19%	1.34%
Oct-09	5.55%	4.19%	1.36%
Nov-09	5.64%	4.31%	1.33%
Dec-09	5.79%	4.49%	1.30%
Jan-10	5.77%	4.60%	1.17%
Feb-10	5.87%	4.62%	1.25%
Mar-10	5.84%	4.64%	1.20%
Apr-10	5.81%	4.69%	1.12%
May-10	5.50%	4.29%	1.21%
Jun-10	5.46%	4.13%	1.33%
Jul-10	5.26%	3.99%	1.27%
Aug-10	5.01%	3.80%	1.21%
Sep-10	5.01%	3.77%	1.24%
Oct-10	5.10%	3.87%	1.23%
Nov-10	5.37%	4.19%	1.18%
Dec-10	5.56%	4.42%	1.14%

Year	A-rated Public Utility	30-Year Treasuries Yield	30-Year Treasuries Spread
Jan-11	5.57%	4.52%	1.05%
Feb-11	5.68%	4.65%	1.03%
Mar-11	5.56%	4.51%	1.05%
Apr-11	5.55%	4.50%	1.05%
May-11	5.32%	4.29%	1.03%
Jun-11	5.26%	4.23%	1.03%
Jul-11	5.27%	4.27%	1.00%
Aug-11	4.69%	3.65%	1.04%
Sep-11	4.48%	3.18%	1.30%
Oct-11	4.52%	3.13%	1.39%
Nov-11	4.25%	3.02%	1.23%
Dec-11	4.33%	2.98%	1.35%
Jan-12	4.34%	3.03%	1.31%
Feb-12	4.36%	3.11%	1.25%
Mar-12	4.48%	3.28%	1.20%
Apr-12	4.40%	3.18%	1.22%
May-12	4.20%	2.93%	1.27%
Jun-12	4.08%	2.70%	1.38%
Jul-12	3.93%	2.59%	1.34%
Aug-12	4.00%	2.77%	1.23%
Sep-12	4.02%	2.88%	1.14%
Oct-12	3.91%	2.90%	1.01%
Nov-12	3.84%	2.80%	1.04%
Dec-12	4.00%	2.88%	1.12%
Jan-13	4.15%	3.08%	1.07%
Feb-13	4.18%	3.17%	1.01%
Mar-13	4.20%	3.16%	1.04%
Apr-13	4.00%	2.93%	1.07%
May-13	4.17%	3.11%	1.06%
Jun-13	4.53%	3.40%	1.13%
Jul-13	4.68%	3.61%	1.07%
Aug-13	4.73%	3.76%	0.97%
Sep-13	4.80%	3.79%	1.01%
Oct-13	4.70%	3.68%	1.02%
Nov-13	4.77%	3.80%	0.97%
Dec-13	4.81%	3.89%	0.92%
Jan-14	4.63%	3.77%	0.86%
Feb-14	4.53%	3.66%	0.87%
Mar-14	4.51%	3.62%	0.89%
Apr-14	4.41%	3.52%	0.89%
May-14	4.26%	3.39%	0.87%
Jun-14	4.29%	3.42%	0.87%
Jul-14	4.23%	3.33%	0.90%
Aug-14	4.13%	3.20%	0.93%
Sep-14	4.24%	3.26%	0.98%
Oct-14	4.06%	3.04%	1.02%
Nov-14	4.09%	3.04%	1.05%
Dec-14	3.95%	2.83%	1.12%
Jan-15	3.58%	2.46%	1.12%
Feb-15	3.67%	2.57%	1.10%
Mar-15	3.74%	2.63%	1.11%
Apr-15	3.75%	2.59%	1.16%
May-15	4.17%	2.96%	1.21%
Jun-15	4.39%	3.11%	1.28%
Jul-15	4.40%	3.07%	1.33%
Aug-15	4.25%	2.86%	1.39%
Sep-15	4.39%	2.95%	1.44%
Oct-15	4.29%	2.89%	1.40%
Nov-15	4.40%	3.03%	1.37%
Dec-15	4.35%	2.97%	1.38%
Jan-16	4.27%	2.86%	1.41%
Feb-16	4.11%	2.62%	1.49%
Mar-16	4.16%	2.68%	1.48%
Apr-16	4.00%	2.62%	1.38%
May-16	3.93%	2.63%	1.30%
Jun-16	3.78%	2.45%	1.33%
Jul-16	3.57%	2.23%	1.34%
Aug-16	3.59%	2.26%	1.33%
Sep-16	3.66%	2.35%	1.31%
Oct-16	3.77%	2.50%	1.27%
Nov-16	4.08%	2.86%	1.22%
Dec-16	4.27%	3.11%	1.16%

Year	A-rated Public Utility	30-Year Treasuries Yield	30-Year Treasuries Spread
Jan-17	4.14%	3.02%	1.12%
Feb-17	4.18%	3.03%	1.15%
Mar-17	4.23%	3.08%	1.15%
Apr-17	4.12%	2.94%	1.18%
May-17	4.12%	2.96%	1.16%
Jun-17	3.94%	2.80%	1.14%
Jul-17	3.99%	2.88%	1.11%
Aug-17	3.86%	2.80%	1.06%
Sep-17	3.87%	2.78%	1.09%
Oct-17	3.91%	2.88%	1.03%
Nov-17	3.83%	2.80%	1.03%
Dec-17	3.79%	2.77%	1.02%
Jan-18	3.86%	2.88%	0.98%
Feb-18	4.09%	3.13%	0.96%
Mar-18	4.13%	3.09%	1.04%
Apr-18	4.17%	3.07%	1.10%
May-18	4.28%	3.13%	1.15%
Jun-18	4.27%	3.05%	1.22%
Jul-18	4.27%	3.01%	1.26%
Aug-18	4.26%	3.04%	1.22%
Sep-18	4.32%	3.15%	1.17%
Oct-18	4.45%	3.34%	1.11%
Nov-18	4.52%	3.36%	1.16%
Dec-18	4.37%	3.10%	1.27%
Jan-19	4.35%	3.04%	1.31%
Feb-19	4.25%	3.02%	1.23%
Mar-19	4.16%	2.98%	1.18%
Apr-19	4.08%	2.94%	1.14%
May-19	3.98%	2.82%	1.16%
Jun-19	3.82%	2.57%	1.25%
Jul-19	3.69%	2.57%	1.12%
Aug-19	3.29%	2.12%	1.17%
Sep-19	3.37%	2.16%	1.21%
Oct-19	3.39%	2.19%	1.20%
Nov-19	3.43%	2.28%	1.15%
Dec-19	3.40%	2.30%	1.10%
Jan-20	3.29%	2.22%	1.07%
Feb-20	3.11%	1.97%	1.14%
Mar-20	3.50%	1.46%	2.04%
Apr-20	3.19%	1.27%	1.92%
May-20	3.14%	1.38%	1.76%
Jun-20	3.07%	1.49%	1.58%
Jul-20	2.74%	1.31%	1.43%
Aug-20	2.73%	1.36%	1.37%
Sep-20	2.84%	1.42%	1.42%
Oct-20	2.95%	1.57%	1.38%
Nov-20	2.85%	1.62%	1.23%
Dec-20	2.77%	1.67%	1.10%
Jan-21	2.91%	1.82%	1.09%
Feb-21	3.09%	2.04%	1.05%
Mar-21	3.44%	2.34%	1.10%
Apr-21	3.30%	2.30%	1.00%
May-21	3.33%	2.32%	1.01%
Jun-21	3.16%	2.16%	1.00%
Jul-21	2.95%	1.94%	1.01%
Aug-21	2.95%	1.92%	1.03%
Sep-21	2.96%	1.94%	1.02%
Oct-21	3.09%	2.06%	1.03%
Nov-21	3.02%	1.94%	1.08%
Dec-21	3.13%	1.85%	1.28%
Jan-22	3.33%	2.10%	1.23%
Feb-22	3.68%	2.25%	1.43%

Average:	12-months	1.10%
	6-months	1.18%
	3-months	1.31%

Common Equity Risk Premiums
Years 1926-2021

	Large Common Stocks	Long-Term Corp. Bonds	Equity Risk Premium	Long-Term Govt. Bonds Yields
Low Interest Rates	12.09%	5.28%	6.81%	2.80%
Average Across All Interest Rates	12.33%	6.40%	5.93%	4.92%
High Interest Rates	12.57%	7.52%	5.05%	7.03%

Source of Information: 2022 SBBI Yearbook Stocks, Bonds, Bills, and Inflation

Basic Series
Annual Total Returns (except yields)

Year	Large Common Stocks	Long-Term Corp. Bonds	Long-Term Govt. Bonds Yields
2020	18.40%	15.40%	1.37%
2021	28.71%	-2.66%	1.88%
1940	-9.78%	3.39%	1.94%
1945	36.44%	4.08%	1.99%
1941	-11.59%	2.73%	2.04%
1949	18.79%	3.31%	2.09%
1946	-8.07%	1.72%	2.12%
1950	31.71%	2.12%	2.24%
2019	31.49%	19.95%	2.25%
1939	-0.41%	3.97%	2.26%
1948	5.50%	4.14%	2.37%
1947	5.71%	-2.34%	2.43%
1942	20.34%	2.60%	2.46%
1944	19.75%	4.73%	2.46%
2012	16.00%	10.68%	2.46%
2014	13.69%	17.28%	2.46%
1943	25.90%	2.83%	2.48%
1938	31.12%	6.13%	2.52%
2017	21.83%	12.25%	2.54%
1936	33.92%	6.74%	2.55%
2011	2.11%	17.95%	2.55%
2015	1.38%	-1.02%	2.68%
1951	24.02%	-2.69%	2.69%
1954	52.62%	5.39%	2.72%
2016	11.96%	6.70%	2.72%
1937	-35.03%	2.75%	2.73%
1953	-0.99%	3.41%	2.74%
1935	47.67%	9.61%	2.76%
1952	18.37%	3.52%	2.79%
2018	-4.38%	-4.73%	2.84%
1934	-1.44%	13.84%	2.93%
1955	31.56%	0.48%	2.95%
2008	-37.00%	8.78%	3.03%
1932	-8.19%	10.82%	3.15%
1927	37.49%	7.44%	3.17%
1957	-10.78%	8.71%	3.23%
1930	-24.90%	7.98%	3.30%
1933	53.99%	10.38%	3.36%
1928	43.61%	2.84%	3.40%
1929	-8.42%	3.27%	3.40%
1956	6.56%	-6.81%	3.45%
1926	11.62%	7.37%	3.54%
2013	32.39%	-7.07%	3.78%
1960	0.47%	9.07%	3.80%
1958	43.36%	-2.22%	3.82%
1962	-8.73%	7.95%	3.95%
1931	-43.34%	-1.85%	4.07%
2010	15.06%	12.44%	4.14%
1961	26.89%	4.82%	4.15%
1963	22.80%	2.19%	4.17%
1964	16.48%	4.77%	4.23%
1959	11.96%	-0.97%	4.47%
1965	12.45%	-0.46%	4.50%
2007	5.49%	2.60%	4.50%
1966	-10.06%	0.20%	4.55%
2009	26.46%	3.02%	4.58%
2005	4.91%	5.87%	4.61%
2002	-22.10%	16.33%	4.84%
2004	10.88%	8.72%	4.84%
2006	15.79%	3.24%	4.91%
2003	28.68%	5.27%	5.11%
1998	28.58%	10.76%	5.42%
1967	23.98%	-4.95%	5.56%
2000	-9.10%	12.87%	5.58%
2001	-11.89%	10.65%	5.75%
1971	14.30%	11.01%	5.97%
1968	11.06%	2.57%	5.98%
1972	18.99%	7.26%	5.99%
1997	33.36%	12.95%	6.02%
1995	37.58%	27.20%	6.03%
1970	3.86%	18.37%	6.48%
1993	10.08%	13.19%	6.54%
1996	22.96%	1.40%	6.73%
1999	21.04%	-7.45%	6.82%
1969	-8.50%	-8.09%	6.87%
1976	23.93%	18.65%	7.21%
1973	-14.69%	1.14%	7.26%
1992	7.62%	9.39%	7.26%
1991	30.47%	19.89%	7.30%
1974	-26.47%	-3.06%	7.60%
1986	18.67%	19.85%	7.89%
1994	1.32%	-5.76%	7.99%
1977	-7.16%	1.71%	8.03%
1975	37.23%	14.64%	8.05%
1989	31.69%	16.23%	8.16%
1990	-3.10%	6.78%	8.44%
1978	6.57%	-0.07%	8.98%
1988	16.61%	10.70%	9.19%
1987	5.25%	-0.27%	9.20%
1985	31.73%	30.09%	9.56%
1979	18.61%	-4.18%	10.12%
1982	21.55%	42.56%	10.95%
1984	6.27%	16.86%	11.70%
1983	22.56%	6.26%	11.97%
1980	32.50%	-2.76%	11.99%
1981	-4.92%	-1.24%	13.34%

Yields for Treasury Constant Maturities
Yearly for 2016-2020 and 2021
and the Twelve Months Ended February 2022

Years	1-Year	2-Year	3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
2016	0.61%	0.84%	1.01%	1.34%	1.64%	1.84%	2.23%	2.60%
2017	1.20%	1.40%	1.58%	1.91%	2.16%	2.33%	2.65%	2.90%
2018	2.33%	2.53%	2.63%	2.75%	2.85%	2.91%	3.02%	3.11%
2019	2.05%	1.97%	1.94%	1.96%	2.05%	2.14%	2.40%	2.58%
2020	0.38%	0.40%	0.43%	0.54%	0.73%	0.89%	1.35%	1.56%
Five-Year Average	1.31%	1.43%	1.52%	1.70%	1.89%	2.02%	2.33%	2.55%
2021	0.10%	0.27%	0.46%	0.86%	1.19%	1.44%	1.98%	2.05%
Months								
Mar-21	0.08%	0.15%	0.32%	0.82%	1.27%	1.61%	2.24%	2.34%
Apr-21	0.06%	0.16%	0.35%	0.86%	1.31%	1.64%	2.20%	2.30%
May-21	0.05%	0.16%	0.32%	0.82%	1.28%	1.62%	2.22%	2.32%
Jun-21	0.07%	0.20%	0.39%	0.84%	1.23%	1.52%	2.09%	2.16%
Jul-21	0.08%	0.22%	0.40%	0.76%	1.07%	1.32%	1.87%	1.94%
Aug-21	0.07%	0.22%	0.42%	0.77%	1.06%	1.28%	1.83%	1.92%
Sep-21	0.08%	0.24%	0.47%	0.86%	1.16%	1.37%	1.87%	1.94%
Oct-21	0.11%	0.39%	0.67%	1.11%	1.40%	1.58%	2.03%	2.06%
Nov-21	0.18%	0.51%	0.82%	1.20%	1.45%	1.56%	1.97%	1.94%
Dec-21	0.30%	0.68%	0.95%	1.23%	1.40%	1.47%	1.90%	1.85%
Jan-22	0.55%	0.98%	1.25%	1.54%	1.70%	1.76%	2.15%	2.10%
Feb-22	1.00%	1.44%	1.65%	1.81%	1.91%	1.93%	2.31%	2.25%
Twelve-Month Average	0.22%	0.45%	0.67%	1.05%	1.35%	1.56%	2.06%	2.09%
Six-Month Average	0.37%	0.71%	0.97%	1.29%	1.50%	1.61%	2.04%	2.02%
Three-Month Average	0.62%	1.03%	1.28%	1.53%	1.67%	1.72%	2.12%	2.07%

Source: Federal Reserve statistical release H.15

Measures of the Risk-Free Rate & Corporate Bond Yields

The forecast of Treasury and Corporate yields
per the consensus of nearly 50 economists
reported in the Blue Chip Financial Forecasts dated December 1, 2021 and March 1, 2022

		Treasury					Corporate	
Year	Quarter	1-Year Bill	2-Year Note	5-Year Note	10-Year Note	30-Year Bond	Aaa Bond	Baa Bond
2022	First	0.8%	1.3%	1.7%	1.9%	2.2%	3.2%	3.9%
2022	Second	1.1%	1.6%	2.0%	2.1%	2.5%	3.4%	4.2%
2022	Third	1.4%	1.8%	2.1%	2.3%	2.6%	3.7%	4.4%
2022	Fourth	1.6%	2.0%	2.3%	2.4%	2.7%	3.9%	4.6%
2023	First	1.8%	2.1%	2.4%	2.6%	2.9%	4.0%	4.8%
2023	Second	2.0%	2.2%	2.5%	2.7%	3.0%	4.1%	4.9%
Long-range CONSENSUS								
2023		1.0%	1.3%	1.9%	2.4%	2.9%	3.7%	4.6%
2024		1.6%	1.9%	2.4%	2.8%	3.3%	4.2%	5.0%
2025		2.1%	2.4%	2.8%	3.1%	3.6%	4.5%	5.3%
2026		2.4%	2.6%	2.9%	3.2%	3.7%	4.6%	5.5%
2027		2.5%	2.6%	2.9%	3.2%	3.7%	4.8%	5.6%
Averages:								
	2023-2027	1.9%	2.2%	2.6%	2.9%	3.4%	4.4%	5.2%
	2028-2032	2.4%	2.6%	3.0%	3.3%	3.8%	4.9%	5.7%

Measures of the Market Premium

Value Line Return

As of:	Dividend Yield		Median Appreciation Potential		Median Total Return
25-Feb-22	1.9%	+	10.67%	=	12.57%

DCF Result for the S&P 500 Composite

D/P		1+.5g		+	g	=	k
1.45%	(	1.069	)	+	13.7%	=	15.25%

Summary

Value Line			12.57%
S&P 500			15.25%
Average			13.91%
Risk-free Rate of Return (Rf)			2.75%
Forecast Market Premium			11.16%
Historical Market Premium			
Low Interest Rates	(Rm)	(Rf)	
1926-2021 Arith. mean	12.09%	2.80%	9.29%
Average - Forecast/Historical			10.23%

Exhibit 7.8: Size-Decile Portfolios of the NYSE/NYSE MKT/NASDAQ Long-Term Returns in Excess of CAPM
1926–2016

Size Grouping	OLS Beta	Arithmetic Mean	Return in Excess of Risk-free Rate (actual)	Return in Excess of Risk-free Rate (as predicted by CAPM)	Size Premium
Mid-Cap (3–5)	1.12	13.82%	8.80%	7.79%	1.02%
Low-Cap (6–8)	1.22	15.26%	10.24%	8.49%	1.75%
Micro-Cap (9–10)	1.35	18.04%	13.02%	9.35%	3.67%
Breakdown of Deciles 1–10					
1-Largest	0.92	11.05%	6.04%	6.38%	-0.35%
2	1.04	12.82%	7.81%	7.19%	0.61%
3	1.11	13.57%	8.55%	7.66%	0.89%
4	1.13	13.80%	8.78%	7.80%	0.98%
5	1.17	14.62%	9.60%	8.09%	1.51%
6	1.17	14.81%	9.79%	8.14%	1.66%
7	1.25	15.41%	10.39%	8.67%	1.72%
8	1.30	16.14%	11.12%	9.04%	2.08%
9	1.34	16.97%	11.96%	9.28%	2.68%
10-Smallest	1.39	20.27%	15.25%	9.66%	5.59%

Betas are estimated from monthly returns in excess of the 30-day U.S. Treasury bill total return, January 1926–December 2016. Historical riskless rate measured by the 91-year arithmetic mean income return component of 20-year government bonds (5.02%). Calculated in the context of the CAPM by multiplying the equity risk premium by beta. The equity risk premium is estimated by the arithmetic mean total return of the S&P 500 (11.95%) minus the arithmetic mean income return component of 20-year government bonds (5.02%) from 1926–2016. Source: Morningstar *Direct* and CRSP. Calculated based on data from CRSP US Stock Database and CRSP US Indices Database ©2017 Center for Research. Used with permission. All calculations performed by Duff & Phelps, LLC.

Comparable Earnings Approach
Using Non-Utility Companies with
Timeliness of 3, 4 & 5; Safety Rank of 1, 2 & 3; Financial Strength of B+, B++, A & A+;
Price Stability of 80 to 100; Betas of .80 to 1.00; and Technical Rank of 2, 3 & 4

Company	Industry	Timeliness Rank	Safety Rank	Financial Strength	Price Stability	Beta	Technical Rank
Agilent Technologies	Precision Instrument	4	2	A	95	0.90	2
Altria Group Inc	Tobacco	4	3	B++	85	0.95	3
AptarGroup Inc	Packaging & Container	3	2	B++	100	0.90	4
Arthur J Gallagher and Company	Financial Svcs. (Div.)	3	1	A	95	1.00	3
Assurant Inc	Financial Svcs. (Div.)	4	2	A	90	0.90	3
Ball Corp	Packaging & Container	3	2	B++	85	0.95	3
Booz Allen Hamilton Holding Corporatio	Industrial Services	3	3	B++	85	0.90	2
Brady Corp	Diversified Co.	4	3	B++	85	1.00	2
Brown Forman Corp (Class B)	Beverage	5	1	A	90	0.90	4
Cable One	Cable TV	5	2	B++	80	0.95	4
CACI International Inc	IT Services	4	3	B+	90	0.90	3
Caseys General Stores Inc	Retail/Wholesale Food	3	3	B+	85	0.90	3
Cboe Global Markets	Brokers & Exchanges	4	2	A	85	0.90	2
Chemed Corporation	Diversified Co.	3	2	A	95	0.85	2
CME Group Inc	Brokers & Exchanges	4	1	A+	90	0.95	3
Cognizant Technology Solutions Corp	IT Services	3	2	A+	85	1.00	3
Commerce Bancshares Inc	Bank (Midwest)	3	1	A	90	0.90	4
Cooper Companies Inc	Med Supp Non-Invasive	3	2	A	85	1.00	3
Dolby Laboratories Inc	Entertainment Tech	3	2	A	90	0.95	2
ESCO Technologies Inc	Diversified Co.	3	3	B+	85	1.00	4
Estee Lauder Companies Inc	Toiletries/Cosmetics	3	2	A	80	1.00	2
FactSet Research Systems Inc	Information Services	5	1	A+	85	0.95	2
GATX Corp	Railroad	3	3	B+	85	0.95	2
Gentex Corp	Auto Parts	3	2	B++	90	0.95	2
Hanover Insurance Group Inc	Insurance (Prop/Cas.)	3	2	A	95	0.95	4
Hershey Company	Food Processing	3	1	A+	100	0.85	3
Ingredion Incorporated	Food Processing	5	2	B++	90	0.95	2
Intercontinental Exch.	Brokers & Exchanges	3	1	A	95	0.95	2
J and J Snack Foods Corp	Food Processing	3	1	A+	85	0.95	4
J B Hunt Transport Services Inc	Trucking	3	1	A+	85	0.95	2
Juniper Networks Inc	Telecom. Equipment	4	2	A	85	1.00	2
Lennox International Inc	Machinery	4	3	B+	85	1.00	3
Marsh and McLennan Companies Inc	Financial Svcs. (Div.)	3	1	A+	100	0.95	2
MAXIMUS Inc	Industrial Services	3	1	A	100	0.80	4
McCormick and Co	Food Processing	3	1	A+	95	0.80	3
Mondelez International Inc	Food Processing	4	1	A	100	0.85	3
MSA Safety	Machinery	3	2	A	80	1.00	4
MSC Industrial Direct Co Inc	Machinery	3	2	A	80	0.95	3
Northwest Bancshares Inc	Thrift	5	3	B+	95	0.95	3
Old National Bancorp	Bank (Midwest)	4	3	B+	80	0.95	3
Omnicom Group Inc	Advertising	4	3	B+	85	1.00	3
OSI Systems Inc	Precision Instrument	4	3	B++	80	0.90	3
Park National Corp	Bank (Midwest)	3	3	B++	80	0.80	3
PerkinElmer Inc	Precision Instrument	4	2	B++	80	0.90	2
Pool Corporation	Recreation	3	2	A	80	0.85	2
Rollins Inc	Industrial Services	3	2	A	85	0.85	4
Schneider National	Trucking	3	3	B++	80	0.80	3
Selective Insurance Group Inc	Insurance (Prop/Cas.)	3	3	B+	90	0.90	3
Service Corp International Inc	Industrial Services	3	3	B+	90	0.95	2
Sonoco Products	Packaging & Container	4	2	A	95	1.00	4
Stepan Company	Chemical (Specialty)	3	3	B++	80	0.80	3
Toro Co	Machinery	4	2	B++	90	1.00	3
Trimas Corporation	Diversified Co.	3	3	B+	80	0.90	2
UniFirst Corp	Industrial Services	5	2	A	90	0.95	4
United Parcel Service	Air Transport	3	1	A+	85	0.80	2
Verisk Analytics Inc	Information Services	3	2	B++	100	0.85	2
Waters Corp	Precision Instrument	4	2	A	85	0.95	2
West Pharmaceutical Services Inc	Med Supp Non-Invasive	4	2	A	80	0.80	3
Wiley John and Sons Inc (Class A)	Publishing	4	3	B++	80	0.85	3
Zoetis Inc	Drug	3	2	B++	90	1.00	2
Average		4	2	A	88	0.92	3
Gas Group	Average	4	2	A	89	0.86	3

Source of Information: Value Line Investment Survey for Windows, February 2022

Comparable Earnings Approach
Five -Year Average Historical Earned Returns
for Years 2016-2020 and
Price Stability of 80 to 100; Betas of .80 to 1.00; and Technical Rank of 2, 3 & 4

Company	2016	2017	2018	2019	2020	Average	Projected 2024-26
Agilent Technologies	15.4%	15.9%	19.9%	20.8%	21.0%	18.6%	19.5%
Altria Group Inc	46.4%	42.5%	51.0%	NMF	NMF	46.6%	NMF
AptarGroup Inc	17.5%	16.8%	13.7%	16.6%	11.6%	15.2%	14.5%
Arthur J Gallagher and Company	11.5%	11.3%	13.9%	12.8%	13.2%	12.5%	15.0%
Assurant Inc	13.8%	12.2%	4.9%	6.8%	7.4%	9.0%	6.5%
Ball Corp	7.7%	7.7%	13.1%	19.2%	17.9%	13.1%	20.5%
Booz Allen Hamilton Holding Corporation	44.0%	55.0%	58.8%	56.4%	50.8%	53.0%	30.5%
Brady Corp	13.3%	13.7%	14.9%	15.4%	13.0%	14.1%	13.5%
Brown Forman Corp (Class B)	48.8%	56.7%	50.7%	41.9%	29.1%	45.4%	53.0%
Cable One	21.8%	18.0%	21.2%	21.2%	20.4%	20.5%	25.0%
CACI International Inc	8.9%	9.1%	9.4%	11.2%	12.1%	10.1%	12.0%
Caseys General Stores Inc	14.9%	11.2%	14.5%	16.1%	16.2%	14.6%	14.5%
Cboe Global Markets	58.4%	12.9%	13.1%	11.1%	13.9%	21.9%	12.0%
Chemed Corporation	20.7%	26.1%	33.9%	31.7%	32.9%	29.1%	31.5%
CME Group Inc	7.5%	18.1%	7.6%	8.1%	8.0%	9.9%	9.0%
Cognizant Technology Solutions Corp	19.3%	21.0%	23.4%	20.3%	17.0%	20.2%	15.5%
Commerce Bancshares Inc	11.0%	11.8%	14.8%	13.4%	10.4%	12.3%	12.0%
Cooper Companies Inc	10.1%	11.7%	10.3%	12.9%	6.2%	10.2%	11.0%
Dolby Laboratories Inc	9.4%	9.4%	12.6%	11.1%	9.5%	10.4%	13.0%
ESCO Technologies Inc	8.3%	8.6%	9.0%	9.9%	7.5%	8.7%	10.0%
Estee Lauder Companies Inc	31.2%	28.5%	36.2%	45.1%	38.4%	35.9%	54.0%
FactSet Research Systems Inc	49.7%	46.1%	50.8%	52.5%	41.6%	48.1%	42.5%
GATX Corp	17.6%	10.4%	11.2%	10.9%	6.5%	11.3%	9.0%
Gentex Corp	18.2%	18.0%	23.5%	21.9%	17.7%	19.9%	26.0%
Hanover Insurance Group Inc	6.5%	6.8%	9.9%	11.4%	11.1%	9.1%	10.5%
Hershey Company	NMF	NMF	80.8%	70.1%	57.2%	69.4%	29.5%
Ingredion Incorporated	20.5%	19.5%	20.8%	16.4%	13.6%	18.2%	17.0%
Intercontinental Exch.	10.6%	10.4%	12.1%	12.7%	12.8%	11.7%	11.0%
J and J Snack Foods Corp	11.9%	11.6%	11.1%	11.4%	2.3%	9.7%	11.0%
J B Hunt Transport Services Inc	30.6%	22.6%	29.7%	24.9%	19.5%	25.5%	18.0%
Juniper Networks Inc	12.9%	17.3%	13.8%	13.0%	11.4%	13.7%	26.0%
Lennox International Inc	NMF	NMF	-	-	-	-	NMF
Marsh and McLennan Companies Inc	28.6%	27.3%	29.5%	22.4%	22.1%	26.0%	20.5%
MAXIMUS Inc	23.8%	22.3%	20.4%	19.3%	17.3%	20.6%	18.5%
McCormick and Co	29.7%	21.4%	20.9%	20.8%	19.4%	22.4%	17.0%
Mondelez International Inc	12.1%	12.5%	14.1%	13.2%	13.5%	13.1%	16.5%
MSA Safety	18.8%	23.6%	27.7%	25.9%	22.4%	23.7%	21.5%
MSC Industrial Direct Co Inc	21.1%	18.7%	20.8%	20.0%	20.1%	20.1%	22.5%
Northwest Bancshares Inc	4.2%	7.6%	8.4%	8.2%	4.9%	6.7%	9.5%
Old National Bancorp	7.4%	6.0%	7.1%	8.4%	7.6%	7.3%	8.0%
Omnicom Group Inc	53.1%	46.0%	52.1%	46.9%	30.7%	45.8%	28.5%
OSI Systems Inc	4.8%	3.7%	5.3%	11.7%	13.2%	7.7%	12.5%
Park National Corp	11.6%	11.3%	13.3%	10.6%	12.3%	11.8%	11.5%
PerkinElmer Inc	13.3%	12.9%	15.6%	16.3%	24.9%	16.6%	11.5%
Pool Corporation	72.6%	74.9%	104.9%	63.8%	57.4%	74.7%	40.0%
Rollins Inc	29.4%	29.2%	32.5%	24.9%	27.7%	28.7%	36.5%
Schneider National	13.2%	20.6%	12.6%	6.6%	10.3%	12.7%	16.5%
Selective Insurance Group Inc	10.6%	10.8%	12.2%	12.0%	9.1%	10.9%	13.5%
Service Corp International Inc	16.2%	21.2%	20.4%	19.4%	29.8%	21.4%	13.5%
Sonoco Products	18.1%	16.5%	19.4%	19.8%	18.2%	18.4%	15.0%
Stepan Company	13.6%	12.4%	14.4%	11.6%	12.9%	13.0%	13.0%
Toro Co	42.0%	43.4%	40.7%	31.9%	29.6%	37.5%	40.5%
Trimas Corporation	11.6%	11.8%	13.1%	9.5%	11.8%	11.6%	11.5%
UniFirst Corp	8.5%	7.4%	10.2%	10.0%	7.8%	8.8%	8.0%
United Parcel Service	NMF	NMF	NMF	NMF	NMF	-	56.0%
Verisk Analytics Inc	33.9%	28.8%	28.9%	19.9%	26.4%	27.6%	24.0%
Waters Corp	22.7%	27.0%	39.9%	-	NMF	29.9%	29.0%
West Pharmaceutical Services Inc	12.9%	11.8%	14.8%	15.4%	18.7%	14.7%	18.0%
Wiley John and Sons Inc (Class A)	17.4%	16.6%	14.2%	NMF	13.6%	15.5%	12.0%
Zoetis Inc	65.4%	66.8%	69.8%	64.8%	48.9%	63.1%	44.5%
Average						22.0%	20.4%
Median						16.0%	16.0%
Average (excluding companies with values >20%)						11.5%	12.6%

Comparable Earnings Approach
Screening Parameters

Timeliness Rank

The rank for a stock's probable relative market performance in the year ahead. Stocks ranked 1 (Highest) or 2 (Above Average) are likely to outpace the year-ahead market. Those ranked 4 (Below Average) or 5 (Lowest) are not expected to outperform most stocks over the next 12 months. Stocks ranked 3 (Average) will probably advance or decline with the market in the year ahead. Investors should try to limit purchases to stocks ranked 1 (Highest) or 2 (Above Average) for Timeliness.

Safety Rank

A measure of potential risk associated with individual common stocks rather than large diversified portfolios (for which Beta is good risk measure). Safety is based on the stability of price, which includes sensitivity to the market (see Beta) as well as the stock's inherent volatility, adjusted for trend and other factors including company size, the penetration of its markets, product market volatility, the degree of financial leverage, the earnings quality, and the overall condition of the balance sheet. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit purchases to equities ranked 1 (Highest) or 2 (Above Average) for Safety.

Financial Strength

The financial strength of each of the more than 1,600 companies in the VS II data base is rated relative to all the others. The ratings range from A++ to C in nine steps. (For screening purposes, think of an A rating as "greater than" a B). Companies that have the best relative financial strength are given an A++ rating, indicating ability to weather hard times better than the vast majority of other companies. Those who don't quite merit the top rating are given an A+ grade, and so on. A rating as low as C++ is considered satisfactory. A rating of C+ is well below average, and C is reserved for companies with very serious financial problems. The ratings are based upon a computer analysis of a number of key variables that determine (a) financial leverage, (b) business risk, and (c) company size, plus the judgment of Value Line's analysts and senior editors regarding factors that cannot be quantified across-the-board for companies. The primary variables that are indexed and studied include equity coverage of debt, equity coverage of intangibles, "quick ratio", accounting methods, variability of return, fixed charge coverage, stock price stability, and company size.

Price Stability Index

An index based upon a ranking of the weekly percent changes in the price of the stock over the last five years. The lower the standard deviation of the changes, the more stable the stock. Stocks ranking in the top 5% (lowest standard deviations) carry a Price Stability Index of 100; the next 5%, 95; and so on down to 5. One standard deviation is the range around the average weekly percent change in the price that encompasses about two thirds of all the weekly percent change figures over the last five years. When the range is wide, the standard deviation is high and the stock's Price Stability Index is low.

Beta

A measure of the sensitivity of the stock's price to overall fluctuations in the New York Stock Exchange Composite Average. A Beta of 1.50 indicates that a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Average. Use Beta to measure the stock market risk inherent in any diversified portfolio of, say, 15 or more companies. Otherwise, use the Safety Rank, which measures total risk inherent in an equity, including that portion attributable to market fluctuations. Beta is derived from a least squares regression analysis between weekly percent changes in the price of a stock and weekly percent changes in the NYSE Average over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. The Betas are periodically adjusted for their long-term tendency to regress toward 1.00.

Technical Rank

A prediction of relative price movement, primarily over the next three to six months. It is a function of price action relative to all stocks followed by Value Line. Stocks ranked 1 (Highest) or 2 (Above Average) are likely to outpace the market. Those ranked 4 (Below Average) or 5 (Lowest) are not expected to outperform most stocks over the next six months. Stocks ranked 3 (Average) will probably advance or decline with the market. Investors should use the Technical and Timeliness Ranks as complements to one another.