COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF DELTA	**)**	
NATURAL GAS COMPANY, INC.	**)**	
FOR AN ADJUSTMENT OF ITS RATES	**)**	**CASE NO. 2021-00185**
AND A CERTIFICATE OF PUBLIC	**)**	
CONVENIENCE AND NECESSITY	**)**	

DIRECT TESTIMONY

AND EXHIBITS

OF

RICHARD A. BAUDINO

ON BEHALF OF

THE KENTUCKY OFFICE OF THE ATTORNEY GENERAL

J. KENNEDY AND ASSOCIATES, INC.
ROSWELL, GEORGIA

SEPTEMBER 27, 2021

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DIRECT TESTIMONY OF RICHARD A. BAUDINO

I. QUALIFICATIONS AND SUMMARY

Q. Please state your name and business address.

A. My name is Richard A. Baudino. My business address is J. Kennedy and Associates, Inc. ("Kennedy and Associates"), 570 Colonial Park Drive, Suite 305, Roswell, Georgia 30075.

Q. What is your occupation and by whom are you employed?

A. I am a consultant with Kennedy and Associates.

Q. Please describe your education and professional experience.

A. I received my Master of Arts degree with a major in Economics and a minor in Statistics from New Mexico State University in 1982. I also received my Bachelor of Arts Degree with majors in Economics and English from New Mexico State in 1979.

I began my professional career with the New Mexico Public Service Commission Staff in October 1982 and was employed there as a Utility Economist. During my employment with the Staff, my responsibilities included the analysis of a broad range of issues in the ratemaking field. Areas in which I testified included cost of service, rate of return, rate design, revenue requirements, analysis of sale/leasebacks of generating plants, utility finance issues, and generating plant phase-ins.

In October 1989, I joined the utility consulting firm of Kennedy and Associates as a Senior Consultant where my duties and responsibilities covered substantially the same areas as those during my tenure with the New Mexico Public Service Commission Staff. I became Manager in July 1992 and was named Director of Consulting in January 1995. Currently, I am a consultant with Kennedy and Associates.

Exhibit RAB-1 summarizes my expert testimony experience.

Q. On whose behalf are you testifying?

A. I am submitting Direct Testimony on behalf of the Kentucky Office of the Attorney General ("KYOAG").

Q. What is the purpose of your Direct Testimony?

A. The purpose of my Direct Testimony is to address the investor required return on equity ("ROE") for the regulated gas operations of Delta Natural Gas Company ("Delta" or "Company"). I will also address the Company's cost of short-term and long-term debt and capital structure. Finally, I will respond to the Direct Testimony and ROE recommendation of Delta witness Mr. Paul Moul.

Q. Please summarize your conclusions and recommendations.

A. I recommend that the Commission authorize an allowed ROE for Delta of 9.10%. My recommendation is based on a ROE range of 8.40% to 9.40%. My recommended range is based on the results of a discounted cash flow ("DCF") analysis applied to a proxy group of seven regulated gas distribution companies. I also performed Capital Asset Pricing Model ("CAPM") analyses using both historical and forecasted risk premiums. The CAPM results are generally lower than my DCF results in this case, which further confirms the reasonableness of my DCF estimates. A 9.10% allowed ROE is reasonable given the low-risk nature of Delta's regulated gas business and is consistent with investor expectations and requirements in the current economic environment of low interest rates.

Based on Delta's historical use of short-term debt, I also recommend to the Commission that short-term debt be included in the Company's capital structure for ratemaking purposes. My recommended capital structure consists of 50.00% common equity, 48.24% long-term debt, and 1.76% short-term debt. I included the company's current cost of short-term debt, 1.00%, in the weighted cost of capital calculation. Including the aforementioned recommendations, the KYOAG's recommended weighted cost of capital for Delta is 6.55%.

Based on the Commission's recent precedent that applies a lower cost of equity for environmental cost riders, I recommend that the Commission apply a lower cost of equity to the investments collected through Delta's Pipeline Replacement Program

("PRP"). I recommend that the Commission consider reducing the cost of equity applicable to PRP investments by 10 - 20 basis points, or 0.10% - 0.20%.

In Section IV, I will respond to the testimony and ROE recommendation of Mr. Moul. I will demonstrate that his recommended ROE of 10.95% for Delta significantly overstates the investor required return for lower risk regulated gas utilities and is inconsistent with today's low interest rate environment. Mr. Moul's inflated ROE recommendation would result in a revenue requirement that is unreasonable and that would harm Delta's Kentucky ratepayers.

II. REVIEW OF ECONOMIC AND FINANCIAL CONDITIONS

Q. What are the main guidelines to which you adhere in estimating the cost of equity?

A. Generally speaking, the estimated cost of equity should be comparable to the returns of other firms with similar risk structures and should be sufficient for the firm to attract capital. These are the basic standards set out by the United States Supreme Court in *Federal Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) and *Bluefield W.W. & Improv. Co. v. Public Service Comm'n*, 262 U.S. 679 (1922).

From an economist's perspective, the notion of "opportunity cost" plays a vital role in estimating the ROE. One measures the opportunity cost of an investment equal to what one would have obtained in the next best alternative. For example, let us suppose that an investor decides to purchase the stock of a publicly-traded regulated gas utility. That investor will make the decision based on the expectation of dividend payments and perhaps some appreciation in the stock's value over time; however, that investor's opportunity cost is measured by what she or he could have invested in as the next best alternative. That alternative could have been another utility stock, a utility bond, a mutual fund, a money market fund, or any other number of investment vehicles.

The key determinant in deciding whether to invest, however, is based on comparative levels of risk. Our hypothetical investor would not invest in a particular regulated gas utility stock if it offered a return lower than other investments of similar risk. The opportunity cost simply would not justify such an investment. Thus, the task for the rate of return analyst is to estimate a return that is equal to the return being offered by other risk-comparable firms.

Q. Does the level of interest rates affect the allowed ROE for regulated utilities?

A. Yes. The common stock of regulated utilities is considered to be interest rate sensitive. This means that the cost of equity for regulated utilities tends to rise and fall with changes in interest rates. For example, as interest rates rise, the cost of equity will also rise, and vice versa when interest rates fall. This relationship is due in large part to the capital-intensive nature of the utility industry, which relies heavily on both debt and equity to finance its regulated investments.

Q. Before you continue, please provide a brief explanation of how the Federal Reserve Board ("Fed") uses interest rates to affect conditions in the financial markets.

A. Generally, the Fed uses monetary policy to implement certain economic goals. The Fed explained its monetary policy as follows:

> Monetary policy in the United States comprises the Federal Reserve's actions and communications to promote maximum employment, stable prices, and moderate long-term interest rates--the three economic goals the Congress has instructed the Federal Reserve to pursue.[1]

One of the Fed's primary tools for conducting monetary policy is setting the federal funds rate. The federal funds rate is the interest rate set by the Fed that banks and credit unions charge each other for overnight loans of reserve balances. Traditionally the federal funds rate directly influences short-term interest rates, such as the Treasury bill rate and interest rates on savings and checking accounts. The federal funds rate has a more indirect effect on long-term interest rates, such as the 30-Year Treasury bond and private and corporate long-term debt. Long-term interest rates are set more by market forces that influence the supply and demand of loanable funds.

Q. Describe the trend in interest rates over the last 10 or so years.

A. Since 2007 and 2008, the overall trend in interest rates in the U.S. and the world economy has been lower and this trend continued into 2020 - 2021 as governments and central banks instituted programs in response to the economic shocks brought about by the Covid-19 pandemic. The trend of lower interest rates was precipitated by the 2007 financial crisis and severe recession that followed in December 2007. In response to this economic crisis, the Fed undertook a series of steps to stabilize

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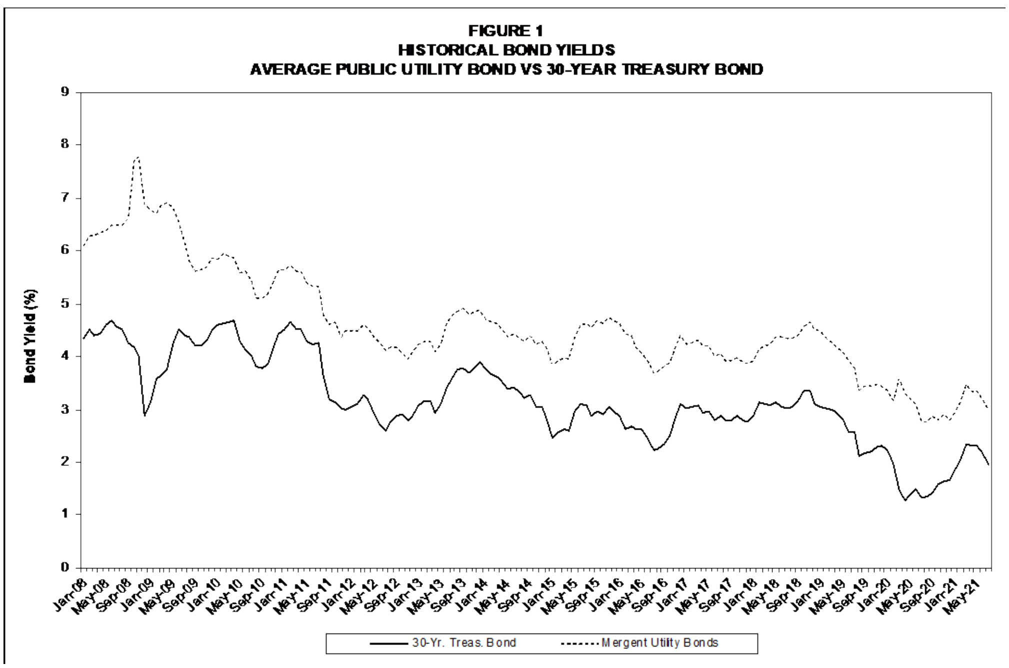
[1] https://www.federalreserve.gov/monetarypolicy.htm

the economy, ease credit conditions, and lower unemployment and interest rates. These steps are commonly known as Quantitative Easing ("QE") and were implemented in three distinct stages: QE1, QE2, and QE3. The Fed's stated purpose of QE was "to support the liquidity of financial institutions and foster improved conditions in financial markets."[2]

Figure 1 below presents a graph that tracks the 30-Year Treasury bond yield and the Mergent average utility bond yield. The time period covered is January 2008 through August 2021.



We can see from the graph in Figure 1 that since 2008, the trend in long-term bond yields has been lower. In January 2008, the yield on the 30-Year Treasury bond

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[2] https://www.federalreserve.gov/monetarypolicy/bst_crisisresponse.htm

was 4.33% and the yield on the average public utility bond was 6.08%. As of August 2021, the 30-Year Treasury yield was 1.92% and the Mergent average utility bond yield was 2.99%.

Q. Please summarize recent Fed actions with respect to monetary policy that led to lower interest rates in 2019 and 2020.

A. In 2019, the Fed lowered the federal funds rate three times. On March 3, 2020, and March 15, 2020, the Fed again lowered the federal funds rate in response to mounting concerns associated with the spread of the coronavirus worldwide and the associated lockdowns of the economy. The Fed lowered the federal funds rate to 0% in March 2020. Beginning in March 2020, the Fed also announced a broad array of expansive new actions to support credit and financial markets and assistance to businesses and households. The Board of Governors of the Fed system established a new resource on its web site that contains the Fed's ongoing response to the COVID-19 pandemic.[3]

On July 28, 2021, the Fed issued its most recent statement regarding its continued support of the U.S. economy and on maintaining the federal funds rate near 0%. The following quotes were drawn from that statement:

> With progress on vaccinations and strong policy support, indicators of economic activity and employment have continued to strengthen. The sectors most adversely affected by the pandemic have shown improvement but have not fully recovered. Inflation has risen, largely reflecting transitory factors. Overall financial conditions remain accommodative, in part

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[3] For more information on the Fed's response to COVID-19, please see: https://www.federalreserve.gov/covid-19.htm

> reflecting policy measures to support the economy and the flow of credit to U.S. households and businesses.
>
> The path of the economy continues to depend on the course of the virus. Progress on vaccinations will likely continue to reduce the effects of the public health crisis on the economy, but risks to the economic outlook remain.
>
> The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. With inflation having run persistently below this longer-run goal, the Committee will aim to achieve inflation moderately above 2 percent for some time so that inflation averages 2 percent over time and longer-term inflation expectations remain well anchored at 2 percent. The Committee expects to maintain an accommodative stance of monetary policy until these outcomes are achieved. The Committee decided to keep the target range for the federal funds rate at 0 to 1/4 percent and expects it will be appropriate to maintain this target range until labor market conditions have reached levels consistent with the Committee's assessments of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time. Last December, the Committee indicated that it would continue to increase its holdings of Treasury securities by at least $80 billion per month and of agency mortgage-backed securities by at least $40 billion per month until substantial further progress has been made toward its maximum employment and price stability goals. Since then, the economy has made progress toward these goals, and the Committee will continue to assess progress in coming meetings. These asset purchases help foster smooth market functioning and accommodative financial conditions, thereby supporting the flow of credit to households and businesses.

The Fed's statement indicates that its stance will be accommodative in the near term, which means that short-term interest rates will be kept low to assist economic recovery, even though inflation may rise above the Fed's target long-term goal of 2.0% in the near term.

Q. Could you show in more detail the course of Treasury and utility bond yields since the beginning of 2020?

A. Table 1 presents the yields on 30-Year Treasury and the Mergent average utility bond from January 2020 through August 2021. The data in Table 1 were taken from Figure 1 in order to more clearly show the course of long-term interest rates since the beginning of the pandemic in 2020.

TABLE 1
30-Year Treasury and
Avg. Utility Bond Yields
January 2020 - August 2021

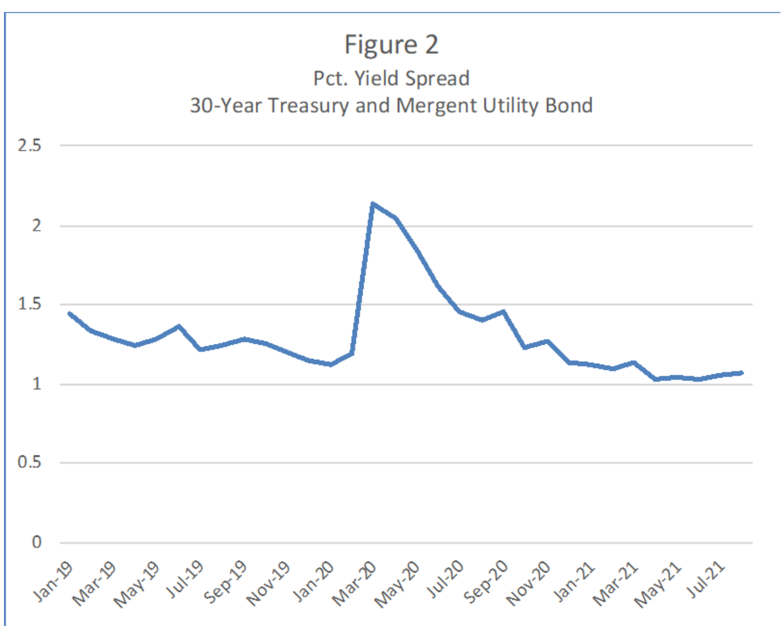
	30-Year Treasury	Avg. Public Utility
Jan-20	2.22	3.34
Feb-20	1.97	3.16
Mar-20	1.46	3.59
Apr-20	1.27	3.31
May-20	1.38	3.22
Jun-20	1.49	3.10
Jul-20	1.31	2.77
Aug-20	1.36	2.76
Sep-20	1.42	2.88
Oct-20	1.57	2.80
Nov-20	1.62	2.89
Dec-20	1.67	2.80
Jan-21	1.82	2.94
Feb-21	2.04	3.13
Mar-21	2.34	3.48
Apr-21	2.30	3.33
May-21	2.32	3.36
Jun-21	2.16	3.19
Jul-21	1.94	2.99
Aug-21	1.92	2.99

Table 1 shows that in March 2020 there was a sharp divergence in the yields of Treasury and utility bond yields. The 30-Year Treasury declined substantially from 1.97% in February to 1.27% in April. Alternatively, utility bond yields went in the opposite direction, increasing from 3.16% in February to 3.59% in March, then declined through August. Both Treasury and utility bond yields increased from August 2020 through May 2021, then declined in June through August 2021.

It is interesting to note that long-term bond yields in July and August 2021 are at roughly the same levels in January 2020, before the pandemic and associated economic shutdowns hit the U.S. economy.

Q. You just mentioned that the yields in Treasury bonds and utility bonds went in different directions early in 2020. Please illustrate and further explain this occurrence.

A. Figure 2 below presents the percentage yield spread between 30-Year Treasury bonds and the Mergent average utility bond from January 2020 through July 2021. Figure 2 shows that the yield spread in January 2020 was 1.12%, meaning that the average utility bond yield was 121 basis points higher than the 30-Year Treasury bond yield. The yield spread then spiked up to 2.13% in March and 2.03% in April. The yield spread then declined from May 2020 and finished August 2021 at 1.07%. The behavior of the monthly yield spreads depicted in Figure 2 suggests that the market's perception of the relative risk of regulated utility bonds increased sharply in March and April of 2020, but has subsided significantly since then.



Q. What are the expectations for inflation and interest rates going forward?

A. The Federal Reserve Bank of Philadelphia publishes the *Survey of Professional Forecasters* ("Survey"), in which a panel of 36 forecasters provides projections for a number of economic variables, including growth in Gross Domestic Product, inflation, unemployment, and short-term and long-term interest rates. The edition for the third quarter was released on August 13, 2021. This most recent edition of the Survey stated the following:

> The U.S. economy for the current quarter looks weaker now than it did three months ago, according to 36 forecasters surveyed by the Federal Reserve Bank of Philadelphia. The panel predicts real GDP will grow at an annual rate of 6.8 percent this quarter, down 0.7 percentage point from the prediction in the last survey. Over the next three quarters, however, the panelists see stronger output growth than they predicted previously. Using the annual-average over annual-average computation, the forecasters expect real GDP to grow at an annual rate of 6.1 percent in 2021 and 4.4 percent in 2022.[4]

Other economic variables were forecasted as follows:

- Consumer Price Index ("CPI") inflation: expected to average 4.9% for 2021 and 2.4% for 2022 and 2.3% for 2023.
- 10-Year Treasury bond yield increasing from 1.5% in 2021 to 1.8% in 2022, 2.2% in 2023, and 2.5% in 2024.
- Over the next 10 years, the forecasters expected CPI inflation to average 2.44%.
- A declining unemployment rate of 5.6% for 2021, 4.3% for 2022, and 3.8% for 2023.[5]

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[4] https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/spf-q3-2021
[5] https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/spf-q3-2021

The Federal Reserve also issued recent economic projections on June 16, 2021. Key data forecasts from the Fed are as follows:

- PCE (Personal consumption expenditures) inflation rate of 3.4% for 2021, 2.1% for 2022, and 2.2% for 2023, with longer run inflation at 2.0%.
- Unemployment rate of 4.5% for 2021, 3.8% for 2022, and 3.5% for 2023. Longer run unemployment rate of 4.0%.
- Growth in real GDP of 7.0% for 2021, 3.3% for 2022, and 2.4% for 2023. Longer run growth rate of 1.8%.[6]

I conclude from these economic forecasts that the consensus is continued economic recovery from the economic shutdowns related to the pandemic, declining unemployment, and a moderate increase in inflation in the near term.

Q. Please provide the Commission with some additional background information regarding market volatility since January 2020 through July 2021.

A. A widely used measure of market volatility is the Chicago Board Options Exchange ("CBOE") Volatility Index ("VIX"), also called the "fear index" or "fear gauge." Basically, the VIX measures the market's expectations for volatility over the next 30-day period. The higher the VIX, the greater the expectation of volatility and market risk. Figure 3 presents the VIX from February 1, 2020 through August 31, 2021. The data was downloaded from the CBOE web site.

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[6] https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20210616.pdf

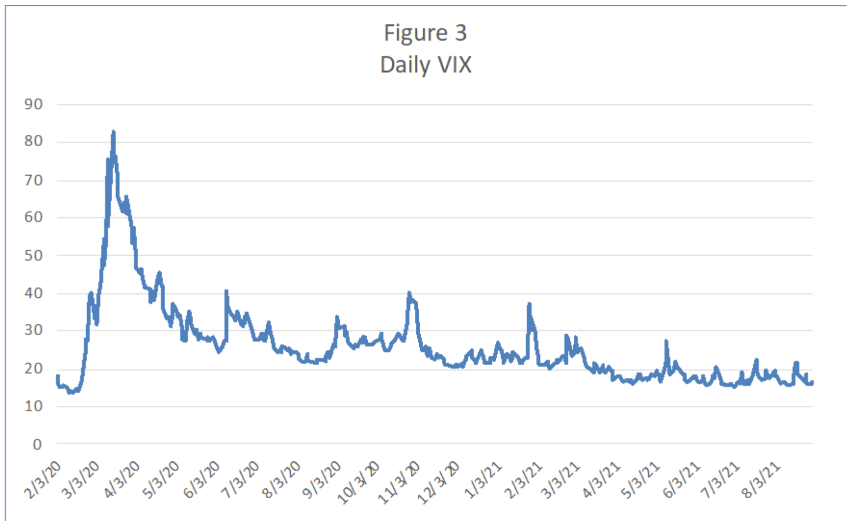

Figure 3 shows that the VIX was much lower at the beginning of February 2020 (17.97), shot up to a high of 82.69 on March 16, then generally declined through the year and the first half of 2021, with the VIX at 16.48 on August 31, 2021. The average VIX for the months of July and August 2021 were 17.60 and 17.42, respectively. Figure 3 shows us that stock market volatility has declined substantially since the March - April 2020 period and is comparable to the daily average for 2019, which was 15.39.

Q. How does the investment community regard the gas distribution utility industry as a whole?

A. The August 27, 2021 Value Line report on the gas distribution industry made the following statement:

> A number of stocks in Value Line's Natural Gas Utility Industry have been rangebound since our last report a few months ago. But that comes as no surprise, given that historical price movements of this typically defensive sector have tended to be on the steady side. It's also important to state that the primary attraction here is these equities' reliable, healthy levels of

> dividend income (which are adequately covered by corporate profits). Consider, too, that at recent quotations there are standouts for capital appreciation potential during the 2024-2026 period, enhancing total return possibilities.

I conclude from Value Line's statements that the natural gas distribution sector provides a consistent stream of income to investors with relatively stable earnings, making these companies lower risk than the overall stock market.

III. DETERMINATION OF FAIR RATE OF RETURN

Q. Please describe the methods you employed in estimating a fair rate of return for the regulated gas operations of Delta.

A. I employed a DCF analysis using a proxy group of seven regulated gas distribution utilities. My DCF analysis is my standard constant growth form of the model that employs growth rate forecasts from the following three sources: dividend and earnings growth from Value Line, and earnings growth from Yahoo! Finance, and Zacks. I also employed CAPM analyses using both historical and forward-looking data. Although I did not rely on the CAPM for my recommended ROE of 9.10% for Delta, the CAPM provides an alternative approach to estimating the ROE for the Company, albeit a less reliable one. In this case, the CAPM results were generally below the DCF results.

<u>DCF Model</u>

Q. Please describe the basic DCF approach.

A. The basic DCF approach is rooted in valuation theory. It is based on the premise that the value of a financial asset is determined by its ability to generate future net cash flows. In the case of a common stock, those future cash flows generally take the form of dividends and appreciation in stock price. The value of the stock to investors is the discounted present value of future cash flows. The general equation then is:

$$V = \frac{R}{(1+r)} + \frac{R}{(1+r)^2} + \frac{R}{(1+r)^3} + \cdots \frac{R}{(1+r)^n}$$

Where: *V = asset value*
R = yearly cash flows
r = discount rate

This is no different from determining the value of any asset from an economic point of view; however, the commonly employed DCF model makes certain simplifying assumptions. One is that the stream of income from the equity share is assumed to be perpetual; that is, there is no salvage or residual value at the end of some maturity date (as is the case with a bond). Another important assumption is that financial markets are reasonably efficient; that is, they correctly evaluate the cash flows relative to the appropriate discount rate, thus rendering the stock price efficient relative to other alternatives. Finally, the model I typically employ also assumes a constant growth rate in dividends. The fundamental relationship employed in the DCF method is described by the formula:

$$k = {}^{D_1}/_{P_0} + g$$

Where: D_1 *= the next period dividend*
P_0 *= current stock price*
g = expected growth rate
k = investor-required return

Using this formula, it is apparent that "k" must reflect the investors' expected return. Use of the DCF method to determine an investor-required return is complicated by the need to express investors' expectations relative to dividends, earnings, and book value over an infinite time horizon. Financial theory suggests that stockholders purchase common stock on the assumption that there will be some change in the rate of dividend payments over time. We assume that the rate of growth in dividends is constant over the assumed time horizon, but the model could easily handle varying growth rates if we knew what they were. Finally, the relevant time frame is prospective rather than retrospective.

Q. What was your first step in conducting your DCF analysis for Delta?

A. My first step was to construct a proxy group of companies with a risk profile that is reasonably similar to the Company. Delta is a wholly-owned subsidiary of PNG Companies, LLC, which is itself a wholly-owned subsidiary of Essential Utilities, Inc. Delta does not have publicly traded stock and, therefore, one cannot estimate a DCF cost of equity on the Company directly. Instead, one must estimate the ROE for a reliable proxy group of companies.

Q. Please describe your approach for selecting a proxy group of companies.

A. I began by reviewing Mr. Moul's proxy group of eight gas distribution utilities ("Gas Group"). Mr. Moul described the criteria he used to select companies for his Gas Group on page 4 of his Direct Testimony. Mr. Moul explained that he began with all of the gas utilities contained in the Value Line Investment Survey, then eliminated NiSource, Inc. and UGI Corporation. This process left him with eight gas distribution utilities, which are identified on page 2 of Attachment PRM-3.

I reviewed Mr. Moul's Gas Group and chose to eliminate one more company from his group of eight companies, Chesapeake Utilities Corporation ("Chesapeake"). According to Chesapeake's 2020 Form 10-K Report, regulated natural gas distribution contributed only 30.8% to the company's total 2020 net income. The rest of Chesapeake's net income came from regulated natural gas transmission, regulated electric distribution, and unregulated enterprises.[7] Since regulated natural gas operations contribute such a small percentage of net income to Chesapeake, it should be eliminated from the gas proxy group.

I would also add that this group of seven companies is consistent with my Direct Testimony filed in Case Nos. 2021-00183 and 2021-00190. In those cases, the cost of capital witnesses for Duke Energy Kentucky, Inc. and Columbia Gas of Kentucky, Inc. also used this gas proxy group of seven companies.

Q. What was your first step in determining the DCF return on equity for the gas proxy group?

A. I first determined the current dividend yield, D_1/P_0, from the basic equation. My general practice is to use six months as the most reasonable period over which to estimate the dividend yield. The six-month period I used covered the months from March through August 2021. I obtained historical prices and dividends from Yahoo! Finance. The annualized dividend divided by the average monthly price represents the average dividend yield for each month in the period.

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[7] Net income numbers taken from pages 2, 8, and 26 of Chesapeake's 2020 Form 10-K report.

The resulting average dividend yield for the gas proxy group is 3.48%. These calculations are shown in Exhibit RAB-2.

Q. Having established the average dividend yield, how did you determine the investors' expected growth rate for the gas proxy group?

A. The investors' expected growth rate, in theory, correctly forecasts the constant rate of growth in dividends. The dividend growth rate is a function of earnings growth and the payout ratio, neither of which is known precisely for the future. We refer to a perpetual growth rate since the DCF model has no arbitrary cut-off point. We must estimate the investors' expected growth rate because there is no way to know with absolute certainty what investors expect the growth rate to be in the short term, much less in perpetuity.

For my analysis in this proceeding, I used three major sources of analysts' forecasts for growth: Value Line, Zacks, and Yahoo! Finance. This is the method I typically use for estimating growth for my DCF calculations.

Q. Please briefly describe Value Line, Zacks, and Yahoo! Finance.

A. Value Line is a widely used and respected source of investor information that covers approximately 1,700 companies in its Standard Edition and several thousand in its Plus Edition. It is updated quarterly and probably represents the most comprehensive of all investment information services. It provides both historical and forecasted information on a number of important data elements. Value Line neither participates in financial markets as a broker nor works for the utility industry in any capacity of which I am aware.

Zacks gathers opinions from a variety of analysts on earnings growth forecasts for numerous firms including regulated gas utilities. The estimates of the analysts responding are combined to produce consensus average estimates of earnings growth. I obtained Zacks' earnings growth forecasts from its web site. Like Zacks, Yahoo! Finance also compiles and reports consensus analysts' forecasts of earnings growth. I also obtained these estimates from Yahoo! Finance's web site.

Q. Why did you rely on analysts' forecasts in your analysis?

A. ROE analysis is a forward-looking process. Five-year or ten-year historical growth rates may not accurately represent investor expectations for future dividend growth. Analysts' forecasts for earnings and dividend growth provide better proxies for the expected growth component in the DCF model than historical growth rates. Analysts' forecasts are also widely available to investors and one can reasonably assume that they influence investor expectations.

Q. Please explain how you used analysts' dividend and earnings growth forecasts in your constant growth DCF analysis.

Q. Columns (1) through (4) of Exhibit RAB-3, page 1, shows the forecasted dividend and earnings growth rates from Value Line and the earnings growth forecasts from Zacks and Yahoo! Finance for the companies in the proxy group. It is important to include dividend growth forecasts in the DCF model since the model calls for forecasted cash flows and Value Line is the only source of which I am aware that forecasts dividend growth.

Q. How did you proceed to determine the DCF ROE for the gas proxy group?

A. To estimate the expected dividend yield (D_1), the current dividend yield must be moved forward in time to account for dividend increases over the next twelve months. I estimated the expected dividend yield by multiplying the current dividend yield by one plus one-half the expected growth rate.

Exhibit RAB-3, page 2, presents my standard method of calculating dividend yields, growth rates, and return on equity for the gas proxy group. The gas proxy group DCF ROE section shows the application of each of four growth rates to the current proxy group dividend yield of 3.48% to calculate the expected dividend yield. I then added the expected growth rates to the expected dividend yield. My DCF ROE was calculated using two different methods. Method 1 uses the average growth rates for the group shown on page 1 of Exhibit RAB-3 and Method 2 utilizes the median growth rates shown on that page.

Q. What are the results of your constant growth DCF model?

A. For Method 1 (average growth rates), the results range from 8.42% to10.81%, with the average of these results being 9.49%. For Method 2 (median growth rates), the results range from 8.05% to 10.60%, with the average of these results being 9.20%[8].

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8 Refer to Exhibit RAB-3, page 2, for these results.

Capital Asset Pricing Model

Q. Briefly summarize the CAPM approach.

A. The theory underlying the CAPM approach is that investors, through diversified portfolios, may combine assets to minimize the total risk of the portfolio. Diversification allows investors to diversify away all risks specific to a particular company and be left only with market risk that affects all companies. Thus, the CAPM theory identifies two types of risks for a security: company-specific risk and market risk. Company-specific risk includes such events as strikes, management errors, marketing failures, lawsuits, and other events that are unique to a particular firm. Market risk includes inflation, business cycles, war, variations in interest rates, and changes in consumer confidence. Market risk tends to affect all stocks and cannot be diversified away. The idea behind the CAPM is that diversified investors are rewarded with returns based on market risk.

Within the CAPM framework, the expected return on a security is equal to the risk-free rate of return plus a risk premium that is proportional to the security's market, or non-diversifiable, risk. Beta is the factor that reflects the inherent market risk of a security and measures the volatility of a particular security relative to the overall market for securities. For example, a stock with a beta of 1.0 indicates that if the market rises by 15%, that stock will also rise by 15%. This stock moves in tandem with movements in the overall market. Stocks with a beta of 0.5 will only rise or fall 50% as much as the overall market. So with an increase in the market of 15%, this stock will only rise 7.5%. Stocks with betas greater than 1.0 will rise and fall more than the overall market. Thus, beta is the measure of the relative risk of individual securities vis-à-vis the market.

Based on the foregoing discussion, the equation for determining the return for a security in the CAPM framework is:

$$K = Rf + \beta(MRP)$$

Where: *K* = *Required Return on equity*
Rf = *Risk-free rate*
MRP = *Market risk premium*
β = *Beta*

This equation tells us about the risk/return relationship posited by the CAPM. Investors are risk averse and will only accept higher risk if they expect to receive higher returns. These returns can be determined in relation to a stock's beta and the market risk premium ("MRP"). The general level of risk aversion in the economy determines the MRP. If the risk-free rate of return is 3.0% and the required return on the total market is 15%, then the risk premium is 12%. Any stock's risk premium can be determined by multiplying its beta by the MRP. Its total return may then be estimated by adding the risk-free rate to that risk premium. Stocks with betas greater than 1.0 are considered riskier than the overall market and will have higher required returns. Conversely, stocks with betas less than 1.0 will have required returns lower than the market as a whole.

Q. In general, are there concerns regarding the use of the CAPM in estimating the ROE?

A. Yes. There is some controversy surrounding the use of the CAPM and its accuracy regarding expected returns. There is substantial evidence that beta is not the primary factor for determining the risk of a security. For example, Value Line's "Safety Rank" is a measure of total risk, not its calculated beta coefficient. Dr. Burton Malkiel, author of *A Random Walk Down Wall Street* noted the following in his best-selling book on investing:

> Second, as Professor Richard Roll of UCLA has argued, we must keep in mind that it is very difficult (indeed probably impossible) to measure beta with any degree of precision. The S&P 500 Index is not "the market." The Total Stock Market contains many thousands of additional stocks in the United States and thousands more in foreign countries. Moreover, the total market includes bonds, real estate, commodities, and assets of all sorts, including one of the most important assets any of us has - the human capital built up by education, work, and life experience. Depending on exactly how you measure "the market" you can obtain very different beta values.[9]

Pratt and Grabowski also stated the following with respect to the CAPM:

> Even though the capital asset pricing model (CAPM) is the most widely used method of estimating the cost of equity capital, the accuracy and predictive power of beta as the sole measure of risk have increasingly come under attack. As a result, alternative measures of risk have been proposed and tested. That is, despite its wide adoption, academics and practitioners alike have questioned the usefulness of CAPM in accurately estimating the cost of equity capital and the use of beta as a reliable measure of risk. [10]

As a practical matter, there is substantial judgment involved in estimating the required market return and MRP. In theory, the CAPM requires an estimate of the return on the total market for investments, including stocks, bonds, real estate, etc. It is nearly impossible for the analyst to estimate such a broad-based return. Often

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[9] *A Random Walk Down Wall Street*, Burton G. Malkiel, page 218, 2019 edition.

[10] *Cost of Capital,* Shannon Pratt and Roger Grabowski, 5th Edition, page 269, published by Wiley.

in utility cases, a market return is estimated using the S&P 500. However, as Dr. Malkiel pointed out, this is a limited source of information with respect to estimating the investor's required return for all investments. In practice, the total market return estimate faces significant limitations to its estimation and, ultimately, its usefulness in quantifying the investor required ROE.

In the final analysis, a considerable amount of judgment must be employed in determining the market return and expected risk premium elements of the CAPM equation. The analyst's application of judgment can significantly influence the results obtained from the CAPM. My past experience with the CAPM indicates that it is prudent to use a wide variety of data in estimating investor-required returns. Of course, the range of results may also be wide, indicating the difficulty in obtaining a reliable estimate from the CAPM.

Q. How did you estimate the market return and MRP of the CAPM?

A. I used two approaches to estimate the MRP portion of the CAPM equation. One approach uses the expected return on the market and is forward-looking. The other approach employs an historical risk premium based on actual stock and bond returns from 1926 through 2020.

Q. Please describe your forward-looking approach to estimating the MRP.

A. The first source I used was the Value Line Investment Analyzer Plus Edition for August 27, 2021. The Value Line Investment Analyzer provides a summary statistical report detailing, among other things, forecasted total annual return over the next 3 to 5 years. I present Value Line's projected annual returns on page 2 of Exhibit RAB-4. I included median and average projected annual return, resulting in a range of 9.00% to 9.84%. The average of these market returns is 9.42%.

Q. Please continue with your market return analysis.

A. I also considered a supplemental check to the Value Line projected market return estimates. Duff and Phelps compiled a study of historical returns on the stock market in its *Cost of Capital Navigator: U.S. Cost of Capital Module*, which is part of its Cost of Capital Navigator subscription service. Some analysts employ this historical data to estimate the MRP of stocks over the risk-free rate. The assumption is that a risk premium calculated over a long period of time is reflective of investor expectations going forward. Exhibit RAB-5 presents the calculation of the market returns and MRPs using the historical data from Duff and Phelps.

Q. Please explain how this historical risk premium is calculated.

A. Exhibit RAB-5 shows the arithmetic average of yearly historical stock market returns over the historical period from 1926 – 2020. The average annual income return for the 20-year Treasury bond is subtracted from these historical stock returns to obtain the historical MRP of stock returns over long-term Treasury bond income returns. The resulting historical MRP is 7.30%.

Q. Did you add an additional measure of the historical risk premium in this case?

A. Yes. Duff and Phelps reported the results of a study by Dr. Roger Ibbotson and Dr. Peng Chen indicating that the historical risk premium of stock returns over long-term government bond returns has been significantly influenced upward by substantial growth in the price/earnings ("P/E") ratio.[11] Duff and Phelps noted that this growth in the P/E ratio for stocks was subtracted out of the historical risk premium to arrive at an adjusted "supply side" historical arithmetic MRP. The most recent "supply side" historical MRP is 6.00%, which I have also included in Exhibit RAB-5.

Q. How did you determine the risk-free rate?

A. I used two different measures for the risk-free rate. The first measure is the average 30-year Treasury bond yield for the six-month period from March through August, 2021. This represents a current measure of the risk-free rate based on actual current Treasury yields, which is 2.16%.

The second measure comes from Duff and Phelps' most recent "normalized" risk-free rate of April 2021. Duff and Phelps developed this normalized risk-free rate using its measure of the "real risk free rate" and expected inflation. The Duff and Phelps normalized risk-free rate is 2.5%.

Q. Please summarize your calculated MRP estimates with the forward-looking data from Value Line and the historical Duff and Phelps equity risk premiums.

A. My MRPs from Exhibit RAB-4 and Exhibit RAB-5 are as follows:

- Forward-looking risk premiums 6.92% - 7.26%
- Historical risk premium 6.00% - 7.30%

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[11] *2019 Cost of Capital: Annual U.S. Guidance and Examples*, Duff and Phelps, Cost of Capital Navigator, Chapter 3, pp. 45 - 47.

By way of comparison, Duff and Phelps currently recommends a market equity risk premium of 5.5% that, combined with its normalized risk-free rate of 2.5%, resulted in a base U.S. cost of capital estimate of 8.0%. Based on this comparison, my range of equity risk premium estimates are certainly not overly conservative or understated.

Q. How did you determine the value for beta?

A. I obtained the betas for the companies in the proxy group from most recent Value Line reports. The average of the Value Line betas for the proxy group is 0.90.

Q. Please summarize the CAPM results.

A. For my forward-looking CAPM ROE estimates, the CAPM results range from 8.69% to 8.73%.[12] Using historical risk premiums, the CAPM results range from 7.56% to 9.07%.[13]

Recommended ROE and Weighted Cost of Capital

Q. Please summarize the cost of equity results for your DCF and CAPM analyses.

A. Table 2 summarizes my ROE results using the DCF and CAPM for the gas proxy group of companies.

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[12] Refer to Exhibit RAB-4, page 1.

[13] Refer to Exhibit RAB-5.

TABLE 2
SUMMARY OF ROE ESTIMATES

DCF Methodology	
Average Growth Rates	
- High	10.81%
- Low	8.42%
- Average	9.49%
Median Growth Rates:	
- High	10.60%
- Low	8.05%
- Average	9.20%
CAPM Methodology	
Forward-lookng Market Return:	
- Current 30-Year Treasury	8.69%
- D&P Normalized Risk-free Rate	8.73%
Historical Risk Premium:	
- Current 30-Year Treasury	7.56% - 8.73%
- D&P Normalized Risk-free Rate	7.90% - 9.07%

Q. What is your recommended ROE range for Delta?

A. I recommend that the KPSC adopt a ROE range of 8.40% - 9.40% for the gas distribution operations of Delta. My recommended ROE for the Company is 9.10%. At this point in time, the average ROE results using the Value Line earnings growth estimates appear to be inflated by two unsustainable double digit earnings growth estimates (10.0% and 11.5%). In this case, I based my recommended ROE range on the average Value Line dividend growth ROE and the consensus analysts' forecasted ROE results. The average of median ROE results also supports my recommendation, only being 10 basis points higher. In addition, if the average Value Line earnings growth ROE of 10.81% is omitted from the Method 1 calculations, the resulting average ROE is 9.06%. Finally, my recommended ROE exceeds all of the CAPM results at this time.

Q. Beginning on page 14 of his Direct Testimony, Mr. Moul presented his assessment of his risk evaluation of Delta compared to the gas proxy group. Please summarize this assessment.

A. On page 15 of his Direct Testimony, Mr. Moul concluded that the risk of Delta exceeds the risk of the gas proxy group. He noted that Delta is much smaller than the companies in his Gas Group and has had more variable earned returns. However, he also noted that Delta's quality of earnings, credit risk, and internally generated funds to construction has been fairly similar to his Gas Group. Finally, Delta's financial risk and operating risk has been lower than the Gas Group.

Q. Do you agree with Mr. Moul's conclusion?

A. No. Mr. Moul's risk evaluation, if anything, shows that Delta is roughly equivalent in risk to his Gas Group. Mr. Moul concluded that Delta was equivalent in risk in three of the areas he evaluated and less risky with respect to financial and operating risk. The two areas in which he concluded that Delta was riskier were its small size relative to the group and more variable earned returns. So according to Mr. Moul, Delta's risk exceeded the risk of the Gas Group in only two of the seven areas he evaluated. Based on the data Mr. Moul provided, there is no reasonable basis to conclude that Delta is more risky than the Gas Group.

Q. Is it reasonable to conclude that Delta is more risky than the gas proxy group due to its relatively small size?

A. No. Mr. Moul presented no evidence that a ROE size premium exists between larger and smaller regulated utilities. I acknowledge that substantial evidence exists for a ROE size premium for smaller companies generally. Duff & Phelps presents this evidence in its *Cost of Capital Navigator* service and demonstrates that, indeed, smaller companies have greater required returns from investors than larger companies. This increased size premium is associated with smaller firms being more risky generally than larger firms. However, the data also show that the betas for smaller firms are substantially higher than betas for regulated utility companies. This relationship underscores lower risk for regulated firms than unregulated ones. In addition, Delta is part of a much larger company, Essential Utilities, which provides substantial financial and operating support to Delta and had 2020 total operating revenues of $1.799 billion. This type of relationship does not exist with smaller, unregulated stand-alone companies.

Finally, one would logically expect that if Delta were more risky due to its small size relative to the gas proxy group, its cost of debt would be higher as well. However, Delta's expected cost of new long-term debt that is included in its projected test year is 3.10%. This expected cost is very close to the current Mergent public utility bond yield of 2.99% in August 2021. This very small difference does not suggest that a small size premium exists for Delta.

Q. In its Order dated October 21, 2010 in Case No. 2010-00116 did the Commission acknowledge Delta's small size in its ROE determination?

A. Yes. In its Order, page 22, the Commission stated:

> The Commission finds that Delta's proposed ROE overstates its risks as well as investor expectations. We are of the opinion, however, that the risk inherent in Delta's small size, as well as the risk caused by its relatively low equity ratio, should be recognized. Having considered and weighed all the ROE evidence in the record, the Commission finds a range of 9.9 percent to 10.9 percent, with a midpoint of 10.4 percent, to be reasonable.

Although the Commission noted Delta's small size in its determination of the allowed ROE for Delta, I respectfully suggest that the Commission consider the arguments I have presented against including a premium for Delta's smaller size in this case. In addition, Delta's approved equity ratio in its last rate case was 44.49%. Given the much higher 50.0% equity ratio I recommend in this case, Delta's equity ratio should no longer be a consideration for a higher ROE in this proceeding.

Q. What is your recommendation with respect to Delta's capital structure?

A. I recommend that the Company's requested capital structure be modified to include some short-term debt. Historically, Delta has used short-term debt to finance its operations. According to the Company's response to Data Request AG 1-8(c), Delta's short-term debt amounts ranged from 0.66% to 6.63% of total capitalization over the calendar years 2015 - 2020.

In addition, Delta witness Packer testified on page 8, lines 9 - 10 of his Direct Testimony that Essential Utilities' goal is to "maintain the approximate range of 50% equity capital and 50% permanent long-term debt capital." In order to reflect additional short-term debt in Delta's capital structure, I recommend reducing Delta's requested common equity ratio from 51.76% to 50.0% and adding 1.76% of short-term debt to total capitalization. I also recommend accepting Delta's requested percentage of 48.24% for long-term debt.

Q. How does your recommended equity ratio of 50% compare with the equity ratios of your gas proxy group?

A. Table 3 presents the 2020 and 2021 equity ratios for the gas proxy group from the Value Line Investment Survey. The group average equity ratio for 2020 is 50.3%, very close to my recommended equity ratio of 50.0% for Delta.

Table 3
Proxy Group Equity Ratios

	2020	2021
Atmos Energy Corp.	60.0%	52.0%
New Jersey Resources	44.9%	46.0%
Northwest Natural Holding Co.	50.8%	51.0%
ONE Gas, Inc.	58.5%	36.0%
South Jersey Industries, Inc.	37.4%	36.5%
Southwest Gas Holdings, Inc.	49.5%	45.5%
Spire Inc.	51.0%	48.0%
Average	50.3%	45.0%

Source: Value Line Investment Survey, Aug. 27, 2021

Q. Compare your gas proxy group common equity ratios with the common equity ratios presented by Mr. Moul on page 16 of his Direct Testimony.

A. According to Mr. Moul's table on page 16 of his Direct Testimony, he presented his Gas Group common equity ratios from Value Line as of March 4, 2016. The forecasted equity ratios for his Gas Group averaged 55.5% for the forecasted period of 2019 - 2021. This data is obviously out of date and does not reflect Value Line's most recent report on gas distribution companies dated August 27, 2021. Actual common equity ratios for the companies in my gas proxy group are much lower than the out of date forecast for 2019 - 2021 presented by Mr. Moul. The Commission should not rely on the data presented by Mr. Moul with respect to the Gas Group common equity ratios.

Q. What is your recommended weighted cost of capital for Delta?

A. I recommend a weighted cost of capital of 6.55%. Table 4 below presents the details of the KYOAG weighted cost of capital.

TABLE 4

KYOAG Recommended Weighted Cost of Capital

	Pct.	Cost	Weighted Cost
Long-term Debt	48.24%	4.11%	1.98%
Short-term Debt	1.76%	1.00%	0.02%
Common Equity	50.00%	9.10%	4.55%
Total	100.00%		6.55%

I accepted Delta's requested cost of lng-term debt of 4.11%. I also used Delta's current cost of short-term debt of 1.0%, which is shown in Mr. Moul's Attachment PRM-1.

ROE Recommendation for Pipeline Replacement Program

Q. Briefly describe the Company's Pipeline Replacement Program ("PRP") Rider.

A. Delta's PRP was approved by an Order of the Commission in Case No. 2010-00116 dated October 21, 2010. The PRP was proposed in the Direct Testimony of Delta witness John Brown. The original purpose of the PRP was to enable the Company to more effectively implement the replacement of base steel mains in its distribution system. The PRP was also designed to include replacement of service lines, curb valves, meter loops, and any mandated relocates. Mr. Brown gave the following explanation as to why Delta needed the PRP:

> We believe the PRP mechanism will provide benefits to Delta as well as to the customer by avoiding the costly and resource intensive process necessary to review adjustments through the traditional rate case process replacing it instead with a simple, straightforward and financially transparent process. The PRP will allow the Company to earn a more timely return on the incremental investment, including incurred overhead expenditures, and be reimbursed for related expenses including incremental depreciation expense and ad valorem taxes while avoiding the resource commitment and expense required by traditional rate cases. The annual PRP filings made by the Company are streamlined so as to avoid the majority of legal and other expenses inherent in traditional rate cases while maintaining an appropriate level of rigor and review.[14]

The PRP Rider enables Delta to include qualifying investments for collection though the rider, with yearly filings that are approved by the Commission. This treatment enables the Company to collect the costs of these investments without filing yearly full rate cases. Investments included in the PRP Rider are allowed to earn a return based on Delta's approved weighted cost of capital.

Q. Should the Commission consider reducing the allowed ROE on investments included in the PRP rider compared to the overall allowed ROE?

A. Yes. The Commission has recently applied a lower ROE to the capital costs being recovered in automatic adjustment mechanisms like Delta's PRP Rider. For example, in Case No. 2020-00061, the Commission approved a lower ROE for Louisville Gas and Electric Company ("LG&E") based on lower capital costs as well as lower risk of capital cost recovery through its Environmental Cost Recovery

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[14] Direct Testimony of John Brown, Delta Natural Gas Company, Case No. 2010-00116, page 9, line 15 through page 10, line 2.

("ECR") rider. The Commission's final Order in that proceeding, dated September 29, 2020, stated the following on page 20:

> The cost of equity is affected by the risk of shareholders not adequately recovering their investment, the risk associated with recovering the investment later than desired, and the risk from the shareholder receiving less than comparable investments. To reduce shareholder risk, utilities can recover specified expenditures, such as environmental expenditures, with more certainty and without filing a general rate case through specific riders. With a rider, since a return is guaranteed and the time line of recovery is known and ordinarily not meaningfully delayed, the required return is less than the ROE associated with a rate case as the risk involved is decreased and most lag associated with recovery is eliminated. According to the S&P Global Report for Major Rate Case Decisions - January - June 2020, after removing ROE premiums, limited rider ROEs are 43 basis points below the January - June 2020 vertically integrated ROE average of 9.67 percent.

Likewise in its Orders in Case Nos. 2020-00349 and 2020-00350 dated June 30, 2021, the Commission once again approved a lower ROE for the ECR riders for LG&E and Kentucky Utilities Co. ("KU"). In its Orders in these cases the Commission (1) lowered the stipulated ROE from 9.55% to 9.425% and (2) approved the lower stipulated ROE applicable to the ECR of 9.35%.[15]

Finally, in its Order dated January 13, 2021 in Case No. 2020-00174 the Commission approved a 9.30% ROE for Kentucky Power Company and a 9.10% ROE for its ECR rider.[16]

Q. How much of a reduction in the allowed ROE should the Commission apply to the PRP Rider?

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[15] Refer to the Commission's discussion on pp. 19 - 23 of its Orders in Case No. 2020-00349 and pp. 21 - 26 in Case No. 2020-00350.

[16] See pp. 26 - 28 and pp. 40 - 51 of the Commission's Order.

A. Based on the Commission's past Orders, I recommend the Commission consider a reduction in the range of 10 - 20 basis points, or 0.10% - 0.20% to its allowed ROE in the case. If the Commission accepts my recommended ROE of 9.10%, then the ROE applied to the PRP Rider would be in the range of 8.90% - 9.00%.

IV. RESPONSE TO DELTA GAS ROE TESTIMONY

Q. Please summarize your conclusions with respect to Mr. Moul's ROE recommendation.

A. Mr. Moul's recommended ROE of 10.95% substantially overstates the investor required ROE for a lower risk gas distribution utility like Delta. I will demonstrate subsequently how Mr. Moul's analyses systematically inflated his DCF, CAPM, and risk premium results.

Q. How did Mr. Moul develop his recommended ROE for Delta?

A. Mr. Moul employed the following models to his Gas Group: the DCF model, the CAPM, the risk premium model, and the comparable earnings model. The ROE results from each of these models is summarized on page 5 of Mr. Moul's Direct Testimony. Mr. Moul explained on page 5 that his 10.95% recommendation was based on the average of the DCF model (11.37%) and the risk premium model (10.50%) on a rounded basis. Mr. Moul's CAPM result (12.51%) and comparable earnings result (12.15%) apparently did not figure into his recommended ROE.

Q. Before you provide more detailed analyses of Mr. Moul's ROE methodologies, how does his recommended ROE compare to recent authorized ROEs from the KPSC?

A. Mr. Moul's recommended 10.95% ROE greatly exceeds recent authorized ROEs from the KPSC as well as Delta's last authorized ROE from the Commission in Case No. 2010-00116, which was 10.40%. I will discuss this ROE award later in my testimony within the context of today interest rate environment.

Q. Are you aware of recent allowed ROEs from the Commission?

A. Yes. I mentioned ROEs recently allowed by the Commission in the section on the allowed ROE for the PRP. I note that in Case No. 2020-00350 the Commission's Order of a 9.425% ROE for LG&E included both electric and gas operations. Other recent Commission ordered ROEs include:

- Kentucky Power, Case No. 2020-00174. The Commission ordered a ROE of 9.30% for Kentucky Power Company. It is my understanding that Kentucky Power filed an appeal of the Commission Order, which included ROE as one of the issues.
- Duke Energy Kentucky, Case No. 2019-00271. The Commission ordered a 9.25% ROE for Duke Energy Kentucky.

These two cases involved electric utility operations, but they indicate the general level and direction of the Commission's recent ROE awards.

Q. Compare the Commission's last allowed ROE for Delta with Mr. Moul's recommended ROE of 10.95%.

A. The Commission's last allowed ROE for Delta was 10.40% and is discussed on pages 15 through 22 of the Commission's Order in Case No. 2010-00116. The Commission's Order is dated October 21, 2010. In 2010, interest rates and long-term bond yields were far above what they are in 2021. Based on the bond yield data I presented in Figure 1 of my testimony, in 2010 the average 30-Year Treasury Bond yield was 4.25% and the average Mergent public utility bond yield was 5.55%. Compare these 2010 long-term bond yields with the yields I presented in Table 1 of my testimony. The 30-Year Treasury Bond yields are below 2.0% in July and August of this year and the Mergent average public utility bond yield is 2.99% for these months. Clearly, interest rates and bond yields have declined substantially since 2010 and it is logical that the Commission's allowed ROE in this case should also be much lower than it was in 2010. Mr. Moul's ROE recommendation of 10.95% runs counter to the reduction in capital costs since 2010.

DCF Analyses

Q. Please summarize Mr. Moul's DCF analysis.

A. Mr. Moul applied a constant growth DCF analysis to his Gas Group beginning on his Attachment PRM-7. Mr. Moul explained that he considered both historical and projected growth rates that were presented in his Attachments PRM-8 and PRM-9.[17] Historical growth rates ranged from 2.56% to 7.31%. The forecasted growth rates ranged from 3.94% (Value Line retention growth) to 7.06% (Value Line earnings per share growth). Mr. Moul recommended a 6.75% growth rate for his DCF model. He testified that growth in earnings per share should receive the greatest emphasis.

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[17] Moul Direct Testimony, page 22, lines 9 - 12.

Mr. Moul also included a "leverage adjustment" in his DCF calculation. Mr. Moul began his discussion of the leverage adjustment on page 26 of his Direct Testimony. The calculation is shown as Attachment PRM-10. Mr. Moul testified that this adjustment accounts for the financial risk difference between market value and book value capital structures.[18] Mr. Moul presented his DCF analysis including the leverage adjustment on page 29 of his Direct Testimony. The constant growth DCF result, 10.44%, plus the leverage adjustment of 0.93% results in Mr. Moul's recommended DCF return on equity of 11.37%.

Finally, Mr. Moul explained that he added a flotation cost adjustment of 1.5%. The flotation cost adjustment added 0.17% to this DCF result, bringing his final DCF ROE result for the Gas Group to 11.57%.

Q. Is Mr. Moul's leverage adjustment to his DCF result appropriate?

A. No. Mr. Moul's leverage adjustment is inappropriate, inflates his recommended DCF result, and should be rejected by the Commission.

First, setting the allowed cost of capital for ratemaking purposes properly utilizes book values of common equity, preferred stock, and long-term debt. The actual book values of capitalization support the utility's investment in plant in service. With respect to the allowed return on common equity, commissions utilize market

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[18] Moul Direct Testimony at page 26, line 19 - 21.

returns on book value in order to fairly compensate the equity investor for the use of his or her capital. Market-based returns are used for common equity because, unlike debt, there is no contractual cost for common equity. Thus, the return on equity must be determined using current market data, and then applied to the percentage of equity in the capital structure based on book value.

It is inappropriate to inflate market-based ROE calculations from the DCF with the leverage adjustment Mr. Moul proposed. Market prices can deviate from book value for any number of reasons. For example, investors may expect utilities to earn more than their required rate of return on equity, which would cause an increase in market stock prices above book value per share. In uncertain times, investors may view regulated utilities as safe investments, causing a flight to quality and thereby bidding up stock prices. Further, in the current low interest rate environment investors likely find the higher dividend yields of relatively lower risk utility stocks attractive alternatives to bonds.

Market based cost of equity estimates applied to the book value of equity is the appropriate means in setting a fair rate of return on invested capital for a regulated utility. Results from the DCF should not be adjusted upward to account for or to prop up high market-to-book ratios, as Mr. Moul has done in this case.

In addition, it is highly doubtful that investors would take the complicated and circuitous route to measuring their required returns on equity that Mr. Moul proposed in his Direct Testimony. Instead, it is much more likely that investors would take a more direct approach and use market data on stock prices and expected growth to estimate a DCF return on equity.

Finally, I would note that bond rating agencies and securities analysts do not assess a utility company's risk based on the market value of its capital structure, but on the book value of its common equity. It is reasonable to assume that investors assess capital structure risk in the same manner. Mr. Moul provided no evidence that investors assess financial risk for regulated utility companies based on the market value of common equity.

Q. Are there other concerns with Mr. Moul's DCF analysis?

A. Yes. Mr. Moul selected a growth rate, 6.75%, which is near the upper end of the analysts' forecasts he considered. If one considers the average of the projected earnings growth rates he used - 4.99%, 5.45%, and 7.06% - the resulting growth rate is 5.83%. The average is 0.92%, or 92 basis points, lower than his recommended growth rate. Using the average of Mr. Moul's expected earnings growth rate range, then his DCF result would be:

$$\text{DCF ROE} = 3.56\% * (1+(.5*5.83\%)) + 5.83\% = 9.49\%$$

This result is 95 basis points less than Mr. Moul's DCF result of 10.44% excluding the leverage adjustment and flotation costs. Mr. Moul's arbitrary selection of a 6.75% growth rate is yet another source that inflated his DCF results.

Q. Should the Commission allow an adjustment for flotation costs in this proceeding?

A. No. A flotation cost adjustment attempts to recognize and collect the costs of issuing common stock. Such costs typically include legal, accounting, and printing costs as well as broker fees and discounts. However, it is likely that flotation costs are already accounted for in current stock prices and that adding an adjustment for flotation costs is double counting. A DCF model using current stock prices should already account for investor expectations regarding the collection of flotation costs. Multiplying the dividend yield by a 4% flotation cost adjustment, for example, essentially assumes that the current stock price is wrong and that it must be adjusted downward to increase the dividend yield and the resulting cost of equity. This is not an appropriate assumption regarding investor expectations or current stock prices. Stock prices most likely already account for flotation costs, to the extent that such costs are even considered by investors.

<u>Risk Premium ROE Analyses</u>

Q. Before you address the specifics of Mr. Moul's Risk Premium ("RP") ROE analyses, do you have any general comments regarding the risk premium method of estimating the investor required ROE for regulated utilities?

A. Yes. The bond yield plus risk premium approach is imprecise and can only provide very general guidance on the current authorized ROE for a regulated gas utility. Historical risk premiums can change substantially over time based on investor preferences and market conditions. As such, this approach is a "blunt instrument," if you will, for estimating the ROE in regulated proceedings. In my view, a properly formulated DCF model using current stock prices and growth forecasts is far more reliable and accurate than the bond yield plus risk premium model that relies on an historical analysis of risk premiums.

Q. Please generally describe the RP approach to estimating the investor required ROE.

A. The RP approach applies the fundamental premise that investing in a bond is less risky than investing in common stock and that common shareholders will require a premium over bond yields to compensate for the additional risk. Common shareholders will be paid dividends only after contractual debt service obligations and preferred dividends are met. This is also true in the event a company is liquidated, a scenario in which bond holders will be paid first and if any funds are left after that, common shareholder will be paid. Due to the inherent additional risks common shareholders face compared to bond holders, there will be an additional risk premium demanded by common shareholders for investing in the common stock of any company. The RP method, then, attempts to quantify that additional risk premium for stocks returns over bond returns.

Q. Briefly summarize Mr. Moul's risk premium analyses.

A. Mr. Moul's risk premium analysis employed a prospective yield on a long-term A-rated utility bond and an expected risk premium based on his analysis of historical risk premiums from the *2021 SBBI Yearbook, Stocks, Bonds, Bills, and Inflation* ("SBBI Yearbook").

Mr. Moul concluded that a 3.75% prospective yield was reasonable for the long-term A-rated utility bond. His approach is described on pages 32 - 34 of his Direct

Testimony. Mr. Moul considered current as well as forecasted bond yields from *Blue Chip Financial Forecasts* in the development of his recommendation.

Mr. Moul's historical risk premium was developed from historical common equity risk premiums during periods of what he described as low, average, and high interest rates. This is presented on page 34 of his Direct Testimony. From this data, Mr. Moul settled on a risk premium of 6.75%.

Q. Is it appropriate to use forecasted interest rates in a risk premium analysis in this case?

A. No, not completely. Mr. Moul also should have considered current bond yields in his RP analysis. Current interest rates and bond yields embody all of the relevant market data and expectations of investors, including expectations of changing future interest rates. The forecasted bond yields used by Mr. Moul are speculative at best. Current interest rates provide tangible and verifiable market evidence of investor return requirements today, and these are the interest rates and bond yields that should be used in both the risk premium and CAPM analyses. To the extent that investors give forecasted interest rates any weight at all, they are already incorporated in current securities prices.

As Dr. Morin pointed out in *New Regulatory Finance:*

> A considerable body of empirical evidence indicates that U.S. capital markets are efficient with respect to a broad set of

> information, including historical and publicly available information.[19]

Dr. Morin also noted the following:

> There is extensive literature concerning the prediction of interest rates. From this evidence, it appears that the no-change model of interest rates frequently provides the most accurate forecasts of future interest rates while at other times, the experts are more accurate. Naïve extrapolations of current interest rates frequently outperform published forecasts. The literature suggests that on balance, the bond market is very efficient in that it is difficult to consistently forecast interest rates with greater accuracy than a no-change model. The latter model provides similar, and in some cases, superior accuracy than professional forecasts.[20]

It is important to realize that investor expectations of changes in future interest rates, if any, are likely already embodied in current securities prices, which include debt securities and stock prices.

Mr. Moul's projected A-rated bond yield of 3.75% is grossly excessive compared to current A-rated public utility bond yields. The Mergent Bond Record reported that for July and August 2021, the average A-rated utility bond yield was 2.95%. The projected bond yield used by Mr. Moul exceeds the current A-rated utility bond yield by 0.80%, or 80 basis point. Mr. Moul's projected A-rated utility bond yield merely serves to inflate his risk premium ROE result.

Q. Is Mr. Moul's historical risk premium analysis reasonable?

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[19] Morin, Roger A., *New Regulatory Finance,* Public Utilities Reports, Inc. (2006) at 279.

[20] Morin, Roger A., *New Regulatory Finance, Public Utilities Reports, Inc. (2006)* at 172.

A. No. First, I described the problem with using historical risk premiums earlier in my testimony. This approach naively assumes that earned returns and the resulting risk premiums in an historical period reflect current investor expectations. Such assumptions should be viewed with a good deal of caution and skepticism. Although historical risk premiums may provide rough guides to estimating current investor required returns, I believe that it is preferable to place the greatest weight on DCF calculations that employ current, rather than historic data.

Secondly, Mr. Moul's analysis of historical risk premiums is not applicable to public utilities. Rather, the historical stock returns used by Mr. Moul are for the S&P 500 Composite. Thus, Mr. Moul assumes without foundation that investors expect the return of regulated public utility stocks to be the same as the S&P 500. This is not correct. Investors expect higher returns for the unregulated stocks in the S&P 500 than they would for the stocks of regulated public utilities. This is borne out by the CAPM, used by both Mr. Moul and myself, which adjusts the market risk premium by the lower betas of utility stocks to estimate the ROE. Generally speaking, investors are willing to accept lower returns for utility stocks in return for their greater safety. Using the earned returns on the S&P 500 as Mr. Moul did would overstate the expected returns for regulated public utilities.

Q. Does the common equity risk premium analysis in Mr. Moul's Attachment PRM-13 make economic sense?

A. No. Table 5 presents Mr. Moul's common equity risk premium results from Attachment PRM-13.

Table 5
Moul Common Equity Risk Premiums

	Large Common Stocks Returns	Long-Term Corporate Bonds Returns	Equity Risk Premium
Low Interest Rates	12.06%	5.43%	6.63%
Average Across All Interest Rates	12.16%	6.49%	5.67%
High Interest Rates	12.26%	7.57%	4.69%

Table 5 shows that no matter which set of interest rates are used, the return on large common stocks changes very little. The difference in large common stock returns for low interest rates and high interest rates is only 20 basis points, or 0.20%. The returns for long-term corporate bonds, however, show substantial variation, going from 5.43% to 7.57%, a difference of 214 basis points, or 2.14%. Although the historical earned returns for large common stock varied little over the time periods examined by Mr. Moul, it is highly unlikely that investors' required returns would have remained virtually unchanged in low and high interest rate environments given the large changes in interest rates in his analysis. This casts significant doubt on the reliability of Mr. Moul's risk premium analysis.

<u>Capital Asset Pricing Model</u>

Q. Briefly summarize Mr. Moul's CAPM analyses.

A. In formulating his CAPM ROE, Mr. Moul employed an unlevered beta, the formula for which may be found on page 36 of his Direct Testimony. Mr. Moul claimed that Value Line betas couldn't be used to directly estimate the CAPM when the market value of common stock is greater than its book value. Mr. Moul's leverage adjustment increased his Gas Group beta from 0.88 to 0.98. For the risk-free rate of return, Mr. Moul used 2.75%, which considered the Blue Chip forecasts.[21] For the market premium, Mr. Moul used the arithmetic mean of historical market performance and a forecasted return from Value Line and S&P, resulting in a market premium of 8.92%.[22] Finally, Mr. Moul added a size adjustment of 1.02% to compensate for the smaller size of his Gas Group. Mr. Moul's recommended CAPM ROE, including flotation costs, was 12.68%.[23]

Q. Please respond to Mr. Moul's CAPM analyses.

A. Mr. Moul's CAPM result is overstated and should be rejected by the Commission.

First, the Commission should reject Mr. Moul's reformulated beta estimate. The appropriate beta to use in the CAPM is one that investors expect based on a stock's relative price movements with the overall market. Mr. Moul introduced a highly questionable adjustment to published Value Line betas based on differences between market and book value capital structures. His claim that a leveraged beta should be used in the CAPM for ratemaking purposes is erroneous. He provided absolutely no evidence that investors in utility company stocks use the calculation of beta he presented in his testimony. It is more reasonable to assume that, to the extent investors

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21 Moul Direct Testimony at page 38, lines 1 - 6.

22 Moul Direct Testimony at page 38, lines 8 - 21.

23 Moul Direct Testimony at page 39, lines 16 - 18.

rely on the CAPM model at all, they also are more likely to rely on widely published beta estimates from Value Line and other sources.

Q. Is it appropriate to include a size adjustment adder to the CAPM ROE as Mr. Moul proposed?

A. No. The data that Mr. Moul relied on to make this adjustment came from the SBBI Yearbook. Research on size premiums is also included in Duff and Phelps *Cost of Capital Navigator*, a source I mentioned earlier in my testimony. Mr. Moul calculated a size premium of 1.02%, or 102 basis points, based on the mid-cap group of companies in the SBBI Yearbook size study shown in his Attachment PRM-14, page 3. This subset of companies has a market capitalization similar to the Gas LDC Group.

The problem with Mr. Moul's approach is that the mid-cap group of companies contains many smaller and more risky unregulated companies. The mid-cap group had an average beta of 1.12, which is significantly greater than the average gas utility proxy group beta of 0.90 in my CAPM analyses. The beta comparison indicates that the many unregulated companies in the mid-cap 4 are riskier than regulated gas distribution utilities like Delta. There is no evidence to suggest that the size premium recommended by Mr. Moul applies to lower risk regulated gas utility companies. The Commission should reject Mr. Moul's small size adjustment of 1.02% in the CAPM.

Q. Should Mr. Moul have considered current interest rates in the formulation of his risk-free rate in the CAPM?

A. Yes. Mr. Moul also should have considered the current yield on 30-year Treasury Bonds for the same reasons I stated in my response to his risk premium analysis. Current 30-year Treasury yields as July and August 2021 were 1.94% and 1.92%, respectively. Duff and Phelps' normalized risk-free rate of 2.5% is also lower than Mr. Moul's recommended 2.75%.

Q. Discuss in more detail how Mr. Moul estimated the expected RP for his CAPM analysis using prospective market returns.

A. The prospective measures included DCF analyses applied to the S&P 500 Composite and the Value Line market return and are presented in Attachment PRM-14, page 2. Mr. Moul estimated the DCF return on the S&P 500 using the constant growth approach, with an average growth rate of 12.60%, resulting in an estimated market return of 14.16%. The resulting MRP using this approach is 11.41% (14.16% less the risk-free rate of 2.75%). Applying this MRP to the CAPM equation using Mr. Moul's unlevered beta of 0.98, and his projected risk-free rate of 2.75% results in the following CAPM ROE:

*CAPM ROE = 2.75% + (.98 * 11.41%) = 13.93%*

Mr. Moul's CAPM result using his projected S&P 500 MRP is so far out of line with the recently allowed ROEs that I described earlier that the Commission should reject it out of hand. Moreover, if we added his proposed size adjustment of 1.02%, the CAPM ROE would be 14.95%. Indeed, CAPM results of 13.93% and 14.95% are clearly unreasonable.

Q. Why is Mr. Moul's projected MRP for the S&P 500 so high?

A. The problem with Mr. Moul's projected MRP for the S&P 500 stems from his overstated expected growth rate 12.60%. This earnings growth rate is unsustainably high in that it vastly exceeds both the historical capital appreciation for the S&P 500 as well as historical and projected GDP growth rates. Duff and Phelps' historical analysis shows that the arithmetic average capital appreciation for the S&P 500 was 8.0% for the historical period 1926 - 2020.[24] Geometric, or compound growth was 6.20%. This historical experience stands in stark contrast to Mr. Moul's growth rate of 12.60%.

This inflated growth rate is not supportable when one further considers both historical and forecasted GDP growth for the U.S. Based on data from the Bureau of Economic Analysis, U.S. Department of Commerce, I calculated that the compound yearly growth rate for U.S. GDP from 1929 - 2020 was 6.0%. Note how this growth nearly matched the historical compound growth rate for capital appreciation for the S&P 500. Regarding forecasts, the Fed's projections that I referenced in Section II of my testimony called for longer-run real GDP growth of 1.8% and PCE inflation of 2.0%. This translates into forecasted nominal GDP of roughly 3.80%. The July 2021 *Update to the Economic Outlook: 2021 to 2031*

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[24] *Summary Statistics of Annual Total Returns, Income Returns, and Capital Appreciation Returns of Basic U.S. Asset Classes*, 1926 - 2020, Cost of Capital Navigator: U.S. Cost of Capital Module

from the Congressional Budget Office ("CBO") shows forecasted nominal GDP to grow at a yearly rate of 3.40% - 3.70% from 2024 to 2031. If we assume forecasted long run GDP growth of around 4.0%, then it is highly unlikely that the market growth rate of 12.32% is sustainable over the long run.

In *Cost of Capital*, Pratt and Grabowski noted the following with respect to growth rates that significantly exceed growth in GDP:

> The growth rate assumed in calculating the terminal value is a compound growth rate *in perpetuity*, which is a very long time. At a growth rate of 20% compounded annually, the company's revenues would soon exceed the gross domestic product (GDP) of the United States and eventually that of the world. Long-term growth rates exceeding the real growth in GDP plus inflation are generally not sustainable. Most analysts use more conservative growth rates in calculating the terminal value. Generally, the long-term growth rate only applies to the existing enterprise or core business net cash flows, consistent with the net cash flow projections in the discounted cash flow method... [25]

Since the constant growth DCF requires a sustainable long-run growth rate, Mr. Moul's inflated projected market return and MRP estimate is erroneous and should be rejected.

Q. Are there other sources of which you are aware that suggest Mr. Moul's projected S&P 500 MRP of 11.41% estimate is unreasonably high?

A. Yes. In the authoritative corporate finance textbook by Brealey, Myers, and Allen the authors stated "Brealey, Myers, and Allen have no official position on the issue,

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[25] *Cost of Capital,* Shannon Pratt and Roger Grabowski, Fifth Edition, page 1195, published by Wiley.

but we believe that a range of 5 to 8 percent is reasonable for the risk premium in the United States."[26]

As I cited earlier in my Direct Testimony, Duff and Phelps currently recommends a MRP of 5.5%, a risk free rate of 2.5%, and an overall U. S. cost of equity of 8.0%. These sources underscore how much Mr. Moul's recommended projected S&P 500 MRP, and his CAPM results in general, are overstated.

Q. Please address the historical risk premium of 9.21% presented by Mr. Moul on page 38 of his Direct Testimony.

A. The 9.21% historical risk premium suffers from the same defects that I described in my response to Mr. Moul's risk premium ROE approach. Mr. Moul attempted to show that a higher historical risk premium exists in a low interest rate period based on his analysis of historical stock market returns. However, as I showed in Table 5, the historical average returns show almost no change in the three interest rate periods studied by Mr. Moul. If we accept Mr. Moul's study at face value, it means that investor required returns do not change no matter what the general level of interest rates is in the economy. In other words, the conclusion one would reach based on Mr. Moul's analysis is that the general level of interest rates does not affect investor required returns for the S&P 500.

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[26] Richard A. Brealey, Stewart C. Myers, and Paul Allen, *Principles of Corporate Finance*, page 154; McGraw-Hill/Irwin, 8th Edition, 2006.

<u>Comparable Earnings</u>

Q. Briefly comment on Mr. Moul's comparable earnings analysis.

A. Mr. Moul performed a comparable earnings analysis on a group of unregulated companies from Value Line that was selected based on several criteria included in his Attachment PRM-15 and which he described on page 41 of his Direct Testimony. Forecasted and historical rates of return were obtained from Value Line and then averaged. The resulting ROE was 12.15%.

I recommend that the Commission reject Mr. Moul's comparable earnings analysis. Forecasted earned returns on book equity are not reasonable proxies for investor expectations in the marketplace. Near-term book accounting returns do not necessarily reflect investor requirements and/or expected market returns. Accounting returns are not necessarily tied to current market forces such as interest rates and stock prices. Thus, they are poor indicators of investors' current required returns. A properly specified and estimated DCF model, which uses current stock prices, is a far more reasonable and accurate gauge of investor requirements.

Further, expected returns on book equity for unregulated companies have nothing to do with investor expected returns for lower-risk regulated gas utilities such as Columbia. And Mr. Moul's 12.15% comparable earnings ROE result is far greater than any KPSC-allowed return in recent memory and fails the test of reasonableness on its face. I recommend that the Commission reject Mr. Moul's comparable earnings analyses.

Q. Has the Commission rejected the comparable earnings approach?

A. Yes. The Commission's Order in Case No. 98-474 discusses the comparable earnings approach on pages 97 and 98. The Commission stated the following in its Order:

> The Commission finds KU's use of unregulated non-electric companies to be inappropriate for use as comparison companies in its DCF and other analyses for ratemaking purposes. Unregulated non-electric companies do not properly represent the environment in which KU operates. KU correctly states that it must compete with all companies, regulated or otherwise, to attract equity capital, not just with other electric utilities. However, investors do not look at Safety Rankings alone when deciding how to invest their money and are fully aware of risk differentials between regulated and unregulated companies. KU operates in an environment where it has an inalienable right to charge a rate that covers all its reasonable and prudent costs and provides its investors an opportunity to earn a reasonable return. Unregulated companies have no such right. A more appropriate set of comparison companies in analyzing investments with similar risk would be other electric utilities.

Q. Does this complete your Direct Testimony?

A. Yes.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF DELTA	**)**	
NATURAL GAS COMPANY, INC.	**)**	
FOR AN ADJUSTMENT OF ITS RATES	**)**	**CASE NO. 2021-00185**
AND A CERTIFICATE OF PUBLIC	**)**	
CONVENIENCE AND NECESSITY	**)**	

EXHIBITS

OF

RICHARD A. BAUDINO

ON BEHALF OF

THE KENTUCKY OFFICE OF THE ATTORNEY GENERAL

J. KENNEDY AND ASSOCIATES, INC.
ROSWELL, GEORGIA

SEPTEMBER 27, 2021