BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission,	:	
	:	
Complainant	:	
	:	
v.	:	Docket No. R-2018-3006818
	:	
Peoples Natural Gas Company LLC,	:	
	:	
Respondent	:	

DIRECT TESTIMONY OF
PAUL R. MOUL, MANAGING CONSULTANT
P. MOUL & ASSOCIATES
ON BEHALF OF
PEOPLES NATURAL GAS COMPANY LLC

Concerning
Rate of Return

DATE SERVED: January 28, 2019

Peoples Statement No. 9

Peoples Natural Gas Company LLC
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
DCF	Discounted Cash Flow
FERC	Federal Energy Regulatory Commission
FOMC	Federal Open Market Committee
FPFTY	Fully Projected Future Test Year
g	Growth rate
IGF	Internally Generated Funds
LDC	local distribution companies
Lev	Leverage modification
LT	Long Term
M&M	Modigliani & Miller
MLP	Master Limited Partnerships
OCI	Other Comprehensive Income
PPUC	Pennsylvania Public Utility Commission
PUC	Public Utility Commission
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

GLOSSARY OF ACRONYMS AND DEFINED TERMS	
ACRONYM	**DEFINED TERM**
S&P	Standard & Poor's
TCJA	Tax Cut and Jobs Act of 2017
v	Represents the value that accrues to existing shareholders from selling stock at a price different from book value
WNA	Weather Normalization Adjustment Mechanism
YTM	Yield to Maturity

DIRECT TESTIMONY OF PAUL R. MOUL

1 **INTRODUCTION AND SUMMARY OF RECOMMENDATIONS**

2 **Q. Please state your name, occupation and business address.**

3 A. My name is Paul Ronald Moul. My business address is 251 Hopkins Road,
4 Haddonfield, New Jersey 08033-3062. I am Managing Consultant at the firm P.
5 Moul & Associates, an independent financial and regulatory consulting firm. My
6 educational background, business experience and qualifications are provided in
7 Appendix A, which follows my direct testimony.

8 **Q. What is the purpose of your direct testimony?**

9 A. My testimony presents evidence, analysis and a recommendation concerning the
10 appropriate cost of equity and overall rate of return that the Pennsylvania Public
11 Utility Commission ("PPUC" or the "Commission") should recognize in the
12 determination of the revenues that Peoples Natural Gas Company LLC ("Peoples"
13 or the "Company") should realize as a result of this proceeding. My analysis and
14 recommendation are supported by the detailed financial data contained in
15 Schedule 1, which is a multi-page document divided into fourteen (14) schedules.

16 **Q. Based upon your analysis, what is your conclusion concerning the**
17 **appropriate rate of return for the Company in this case?**

18 A. My conclusion is that the Company's cost of common equity is 11.25%. The
19 11.25% cost of equity includes recognition of the exemplary performance of the
20 Company's management, as a provider of high quality customer service and as a
21 leader in the replacement of cast iron mains and the rehabilitation of its
22 infrastructure. My cost of equity determination should be viewed in the context

1 of increasing capital costs revealed by rising interest rates and the need for
2 supportive regulation at a time of increased infrastructure improvements now
3 underway for the Company. Moreover, as I will describe below, there is more
4 risk faced by the Company with the passage of the Tax Cut and Jobs Act of 2017
5 ("TCJA") signed into law on December 22, 2017. As shown on page 1 of
6 Schedule 1, I have presented the weighted average cost of capital for the
7 Company, which is calculated with the October 31, 2020 Fully Projected Future
8 Test Year ("FPFTY"). The Company's proposed rate of return is shown below:

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Total Debt	46.34%	4.24%	1.96%
Common Equity	53.66%	11.25%	6.04%
Total	100.00%		8.00%

9 The resulting overall cost of capital, which is the product of weighting the
10 individual capital costs by the proportion of each respective type of capital,
11 should establish a compensatory level of return for the use of capital and, if
12 achieved, will provide the Company with the ability to attract capital on
13 reasonable terms.

14 **Q. What background information have you considered in reaching a conclusion**
15 **concerning the Company's cost of capital?**

16 A. The Company provides natural gas service to approximately 625,000 customers in
17 Pittsburgh and surrounding counties in western Pennsylvania. The Company
18 consists of its legacy operations and those of Equitable Gas Company. As of the

1 historic test year, gas throughput (both sales and transportation) for Peoples was
2 comprised of approximately 45% to residential, 27% to commercial, 28% to
3 industrial customers. The Company's top ten customers represent approximately
4 27 million MCF, or approximately 22% of total throughput, but less than 1% of
5 revenue. This means that the Company is faced with a relatively high
6 concentration of throughput to a few customers. Further, the Company provides
7 discounted service to competitive commercial and industrial accounts. The
8 Company obtains its natural gas supply from both local Pennsylvania producers
9 and purchases that are delivered by interstate pipelines. The Company
10 supplements flowing natural gas with gas withdrawn from underground storage.
11 Peoples is a wholly-owned subsidiary of PNG Companies, LLC, which is
12 ultimately owned by SteelRiver Infrastructure Fund North American LP, an
13 unaffiliated fund managed by SteelRiver Infrastructure Associates LLC
14 ("SteelRiver") a privately held company.

15 **Q. How have you determined the cost of common equity in this case?**

16 A. The cost of common equity is established using capital market and financial data
17 relied upon by investors to assess the relative risk, and hence the cost of equity,
18 for a gas distribution utility, such as the Company. In this regard, I have
19 considered four (4) well-recognized models. These methods include: the
20 Discounted Cash Flow ("DCF") model, the Risk Premium ("RP") analysis, the
21 Capital Asset Pricing Model ("CAPM"), and the Comparable Earnings ("CE")
22 approach. The results of a variety of approaches indicate that the Company's rate
23 of return on common equity is 11.25%.

1 **Q. In your opinion, what factors should the Commission consider when**
2 **determining the Company's cost of capital in this proceeding?**
3 A. The Commission's rate of return allowance must be set to cover the Company's
4 interest and dividend payments, provide a reasonable level of earnings retention,
5 produce an adequate level of internally generated funds to meet capital
6 requirements, be commensurate with the risk to which the Company's capital is
7 exposed, assure confidence in the financial integrity of the Company, support
8 reasonable credit quality, and allow the Company to raise capital on reasonable
9 terms. The return that I propose fulfills these established standards of a fair rate
10 of return set forth by the landmark Bluefield and Hope cases.[1] That is to say, my
11 proposed rate of return is commensurate with returns available on investments
12 having corresponding risks.
13 **Q. How have you measured the cost of equity in this case?**
14 A. The models that I used to measure the cost of common equity for the Company
15 were applied with market and financial data developed from a group of nine (9)
16 gas companies. The companies are identified on page 2 of Schedule 3. I will
17 refer to these companies as the "Gas Group" throughout my testimony. In the
18 recent Quarterly Earnings Report approved by the Commission on October 25,
19 2018, the Gas Distribution Company group included six companies that are part
20 of my Gas Group. I will make a separate calculation of the cost of equity using
21 the six-company subgroup.
22 **Q. Please explain the selection process used to assemble the Gas Group?**

[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).

1 A. I began with all of the gas utilities contained in The Value Line Investment
2 Survey, which consists of ten companies. Value Line is an investment advisory
3 service that is a widely used source in public utility rate cases. Through the
4 application of my screening process, I eliminated one company. UGI Corp. was
5 removed due to its diversified businesses consisting of six reportable segments,
6 including propane, two international LPG segments, natural gas utility, energy
7 services, and electric generation. The elimination was attributed to operational
8 differences and diversification. The remaining nine companies are identified in
9 page 2 of Schedule 3.

10 **Q. How have you performed your cost of equity analysis with the market data**
11 **for the Gas Group?**

12 A. I have applied the models/methods for estimating the cost of equity using the
13 average data for the Gas Group. I have not measured separately the cost of equity
14 for the individual companies within the Gas Group, because the determination of
15 the cost of equity for an individual company can be problematic. The use of
16 group average data will reduce the effect of potentially anomalous results for an
17 individual company if a company-by-company approach were utilized.

18 **Q. Please summarize your cost of equity analysis.**

19 A. My cost of equity determination was derived from the results of the
20 methods/models identified above. In general, the use of more than one method
21 provides a superior foundation to arrive at the cost of equity. At any point in
22 time, a single method can provide an incomplete measure of the cost of equity.
23 The specific application of these methods/models will be described later in my

1 testimony. The following table provides a summary of the indicated costs of
2 equity using each of these approaches.

	Gas Group	Subgroup
DCF	11.19%	11.59%
Risk Premium	11.50%	11.50%
CAPM	11.96%	11.96%
Comparable Earnings	12.45%	12.45%

3 As I will discuss later, Peoples has more risk than the Gas Group and Subgroup
4 attributed to its smaller size and other factors. My 11.25% cost of equity
5 recommendation includes 25 basis points or 0.25% recognition for the exemplary
6 performance of the Company's management. The exemplary performance of the
7 Company's management is described in the direct testimony of Mr. Morgan
8 O'Brien. Mr. O'Brien describes the many initiatives that the Company has
9 undertaken, which have produced high quality service at reasonable prices. The
10 11.25% rate of return on common equity is reasonable because it is within the
11 range of returns of the models shown above. My recommended rate of return on
12 common equity of 11.25% is likewise conservative because it makes no provision
13 for the prospect that the rate of return may not be achieved due to unforeseen
14 events, such as unexpected spikes in the cost of purchased products and other
15 expenses. To obtain new capital and retain existing capital, the rate of return on
16 common equity must be high enough to satisfy investors' requirements. From

1 these measures, I recommend a cost of equity of 11.25% with recognition of the
2 exemplary performance of the Company's management.

3 **NATURAL GAS RISK FACTORS**

4 **Q. What factors currently affect the business risk of natural gas utilities?**

5 A. Gas utilities face risks arising from competition, economic regulation, the
6 business cycle, and customer usage patterns. Today, they operate in a more
7 complex environment with time frames for decision-making considerably
8 shortened. Their business profile is influenced by market-oriented pricing for the
9 commodity distributed to customers and open access for the transportation of
10 natural gas for customers.

11 Natural gas utilities have focused increased attention on safety and
12 reliability issues and on conservation. In order to address these issues and to
13 comply with new and pending pipeline safety regulations, natural gas companies
14 are now allocating more of their resources to addressing aging infrastructure.

15 Finally, the existence of local gas production in the Company's service
16 territory and potential access to interstate pipelines provide a bypass threat to the
17 Company, especially with production from the Marcellus Shale formation.
18 Overall, the Company's risk of competition is considerably higher than that faced
19 by many LDCs, including the members of the Gas Group that I used to measure
20 the Company's cost of equity.

21 **Q. Are there other features of the Company's business that should be**
22 **considered when assessing the Company's risk?**

1 A. Yes. Most of the Company's residential and commercial customers use natural
2 gas for space heating purposes. This indicates that a large proportion of the
3 Company's residential and commercial customers present a low load factor
4 profile and their energy demands are significantly influenced by temperature
5 conditions, over which the Company has absolutely no control. I should note that
6 for the Gas Group, rate stabilization mechanisms (e.g., weather normalization
7 adjustments, decoupling, infrastructure trackers/riders) provide a common
8 characteristic of most of these companies. In the LDC industry, rate stabilization
9 mechanisms are frequently expected by investors for gas distribution utilities.
10 Peoples does not have a rate stabilization mechanism, thus making it a riskier
11 company than the Gas Group.

12 **Q. Is Peoples proposing to adjust its rates to deal with this issue?**

13 A. Yes. The Company is proposing a meaningful increase in its monthly customer
14 charge to more closely align it with its fixed costs. If the Commission does not
15 adopt the Company's proposal, then the Company will continue to have higher
16 risk. Failing to approve the Company's proposal would miss the opportunity to
17 mitigate one of the high-risk traits of Peoples.

18 **Q. Are you aware that there is a DSIC available to natural gas utilities in**
19 **Pennsylvania, and does the DSIC affect the Company's cost of capital?**

20 A. I am aware that the Company has utilized the DSIC in the past. The cost of
21 capital for Peoples, however, is not affected by the DSIC. I say this because most
22 of the proxy group companies (i.e., six of eight companies) whose data has been
23 used to develop the cost of equity for Peoples in this proceeding have a DSIC or

1 similar infrastructure rehabilitation mechanisms. Indeed, Atmos Energy, New
2 Jersey Resources, Northwest Natural Gas, South Jersey Industries, Southwest
3 Gas, and Spire make use of a DSIC or similar infrastructure rehabilitation
4 mechanisms. Hence, whatever the benefit of a DSIC, or other regulatory
5 mechanisms, that impact is already reflected in the market evidence of the cost of
6 equity for the proxy group.

7 **Q. How does the Company's throughput to large volume users or those with**
8 **competitive alternatives affect its risk profile?**

9 A. The Company's risk profile is influenced by natural gas delivered to its large
10 industrial and commercial customers and those customers with competitive
11 alternatives. Generally speaking, there are four primary threats to throughput to
12 the Company's largest volume users. First, the Company can and has experienced
13 attrition in this large customer group. Second, the Company's largest customers,
14 which have traditionally used transportation service, have the ability to bypass the
15 Company's system to other gas supply sources such as interstate pipelines, other
16 local distribution companies, and/or nonregulated pipeline contractors providing
17 access to local supplies. Third, in addition to the bypass threat, a material portion
18 of the large customer throughput can be exposed to fuel switching to coal, oil,
19 propane, or other energy sources depending on the fluctuating costs of these
20 different fuels in comparison with natural gas. Finally, in its effort to retain load,
21 the Company is vulnerable to the impacts of business cycles, competition within
22 its customers' industries, and other external factors that can result in shifts of

1 production to customer facilities that are not served by the Company. All of these
2 risks put fixed cost recovery for this class of customers at risk.

3 **Q. Please indicate how the Company's construction program affects its risk**
4 **profile.**

5 A. The Company is faced with the requirement to undertake investments to maintain
6 and upgrade existing facilities in its service territory. To maintain safe and
7 reliable service to existing customers, the Company must invest to upgrade its
8 infrastructure. The rehabilitation of the Company's infrastructure represents
9 capital expenditures that do not increase the Company's customer base. Although
10 the Company has made significant strides in reducing its percentage of cast iron
11 and unprotected steel pipe, these facilities still represent 2,859 miles (or
12 approximately 27%) of its distribution mains as of year-end 2017. The Company
13 also has 52,412 (or approximately 9%) of its services constructed of unprotected
14 steel. For the future, the Company expects its net capital expenditures to be:

Year		Capital Expenditures
Twelve Months Ended Sept. 30, 2019		$ 276,829,500
Thirteen Months Ended Oct. 31, 2020		$ 296,654,157
Total		$ 573,483,657

15 The Company's total capital expenditures over the next two years will represent
16 approximately 27% ($573,483,657÷ $2,103,883,000) of the net utility plant in
17 service at September 30, 2018.

18 **Q. You indicated previously that the new federal income tax law changes will**
19 **add to the Company's risk. Please explain.**

1 A. There are several major financial consequences arising from the changes in the
2 federal income tax law that will negatively impact the Company. First, a lower
3 federal income tax rate will lower the Company's pre-tax interest coverage and
4 will reduce credit quality and increase risk. For example, page 1 of Schedule 1
5 shows that with the new marginal federal corporate income tax rate the pre-tax
6 interest coverage will be 5.22 times at proposed rates. Under the old 35%
7 marginal federal corporate income tax rate, the pre-tax interest coverage would
8 have been 6.13 times. When pre-tax interest coverage declines, credit quality
9 falls and credit risk increases. This assumes no other changes in tax provisions
10 that may also impact the Company's financial condition and credit quality.
11 Second, with a lower marginal federal corporate income tax rate, the Company's
12 return variability will increase, thereby increasing its business risk. When the
13 federal corporate income tax rate was formerly 35%, investors only needed to
14 absorb 65% of any changes in revenues and expenses. At a 21% federal corporate
15 income tax rate, investors will need to absorb 79% of changes in revenues and
16 expenses. That is to say, the reduced federal income taxes will make investor
17 returns more variable than formerly, thereby increasing the Company's risk.
18 Third, utilities will require more investor supplied capital to fund their
19 construction programs because the level of deferred taxes will decline and
20 because the new tax law eliminates bonus depreciation. This will also impact
21 another credit metric revealed by the percentage of internally generated funds to
22 construction. This percentage will decline with the new lower income tax rate. In
23 response to these financial challenges caused by the new lower federal corporate

1 income tax rate, there may be the need to reduce the percentage of debt in a
2 utility's capital structure to respond to higher business risk and weaker credit
3 quality measures.

4 **Q. How should the Commission respond to the issues facing the natural gas**
5 **utilities and in particular Peoples?**

6 A. The Commission should recognize and take into account the need to replace
7 infrastructure and the competitive environment in the natural gas business in
8 determining the cost of capital for the Company and provide a reasonable
9 opportunity for the Company to actually achieve its cost of capital. The
10 Commission should also act to sustain the Company's cash flow that will decline
11 prospectively with the TCJA. A fair rate of return also represents a key to a
12 financial profile that will provide the Company with the ability to raise the
13 significant amount of capital necessary to meet its capital needs on reasonable
14 terms.

15 **FUNDAMENTAL RISK ANALYSIS**

16 **Q. Is it necessary to conduct a fundamental risk analysis to provide a**
17 **framework for a determination of a utility's cost of equity?**

18 A. Yes, it is. It is necessary to establish a company's relative risk position within its
19 industry through a fundamental analysis of various quantitative and qualitative
20 factors that bear upon investors' assessment of overall risk. The qualitative
21 factors that bear upon Company risk have already been discussed previously. The
22 quantitative risk analysis follows. The items that influence investors' evaluation

1 of risk and their required returns were described above. For this purpose, I
2 compared the Company to the S&P Public Utilities, an industry-wide proxy
3 consisting of various regulated businesses, and to the Gas Group.

4 **Q. What are the components of the S&P Public Utilities?**

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

8 **Q. What companies comprise the gas group?**

9 A. My Gas Group consists of the following companies: Atmos Energy Corp.,
10 Chesapeake Utilities Corporation, New Jersey Resources Corp., NiSource, Inc.,
11 Northwest Natural Holding Co., ONE Gas, Inc., South Jersey Industries, Inc.,
12 Southwest Gas Holdings, and Spire, Inc. The subgroup (the "Subgroup") that I
13 used contains six companies and was obtained from the Commission's Quarterly
14 Earnings Report and excluded ONE Gas, Southwest Gas and Spire.

15 **Q. Is knowledge of a utility's bond rating an important factor in assessing its**
16 **risk and cost of capital?**

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

1 **Q. How do the credit quality ratings compare for the Company, the Gas Group,**
2 **and the S&P Public Utilities?**
3 A. The Company obtains its external capital from PNG Companies, and as such it
4 has no rating on its debt. Presently, the credit quality ratings for PNG Companies
5 are Baa2 from Moody's Investors Service ("Moody's") and BBB+ from Standard
6 & Poor's Corporation ("S&P"). These ratings represent the Long Term ("LT")
7 issuer rating by Moody's and the corporate credit rating ("CCR") designation by
8 S&P, which focuses upon the credit quality of the issuer of the debt rather than
9 upon the debt obligation itself.
10 For the Gas Group, the average LT issuer rating is A2 by Moody's and the
11 average CCR is A- by S&P, as displayed on page 2 of Schedule 3. The average
12 ratings for the Subgroup that was used in the Quarterly Earnings Report is the
13 same. For the S&P Public Utilities, the average credit quality rating is A3 by
14 Moody's and BBB+ by S&P, as displayed on page 3 of Schedule 4. Many of the
15 financial indicators that I will subsequently discuss are considered during the
16 rating process.
17 **Q. How do the financial data compare for the Company, the Gas Group, and**
18 **the S&P Public Utilities?**
19 A. The broad categories of financial data that I will discuss are shown on Schedules
20 2, 3, and 4. The data cover the five-year period 2013-2017. The important
21 categories of relative risk may be summarized as follows:
22 Size. In terms of capitalization, the Company is smaller than the average
23 size of the Gas Group, and smaller still than the average size of the S&P Public

1 Utilities. Indeed, the Company is less than one-half the average size of the Gas
2 Group. All other things being equal, a smaller company is riskier than a larger
3 company because a given change in revenue and expense has a proportionately
4 greater impact on a small firm. As I will demonstrate later, the size of a firm can
5 impact its cost of equity.

6 Market Ratios. Market-based financial ratios, such as earnings/price ratios
7 and dividend yields, provide a partial measure of the investor-required cost of
8 equity. If all other factors are equal, investors will require a higher rate of return
9 for companies that exhibit greater risk, in order to compensate for that risk. That
10 is to say, a firm that investors perceive to have higher risks will experience a
11 lower price per share in relation to expected earnings.[2]

12 There are no market ratios available for the Company because its stock is
13 owned by PNG Companies, whose stock is also not traded. The five-year average
14 price-earnings multiple was slightly higher for the Gas Group as compared to the
15 S&P Public Utilities. The five-year average dividend yield was lower for the Gas
16 Group as compared to the S&P Public Utilities. The five-year average market-to-
17 book ratio was somewhat higher for the Gas Group as compared to the S&P
18 Public Utilities.

19 Common Equity Ratio. The level of financial risk is measured by the
20 proportion of long-term debt and other senior capital that is contained in a
21 company's capitalization. Financial risk is also analyzed by comparing common

[2]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).

1 equity ratios (the complement of the ratio of debt and other senior capital). That
2 is to say, a firm with a high common equity ratio has lower financial risk, while a
3 firm with a low common equity ratio has higher financial risk. The five-year
4 average common equity ratios, based on permanent capital, were 51.4% for
5 Peoples, 53.8% for the Gas Group, and 43.6% for the S&P Public Utilities. The
6 historic common equity ratio for Peoples is lower than the Gas Group, thereby
7 indicating higher financial risk.

8 Return on Book Equity. Greater variability (i.e., uncertainty) of a firm's
9 earned returns signifies relatively greater levels of risk, as shown by the
10 coefficient of variation (standard deviation ÷ mean) of the rate of return on book
11 common equity. The higher the coefficients of variation, the greater degree of
12 variability. For the five-year period, the coefficients of variation were 0.182
13 (1.6% ÷ 8.8%) for the Company, 0.076 (0.7% ÷ 9.2%) for the Gas Group, and
14 0.064 (0.6% ÷ 9.4%) for the S&P Public Utilities. The variability of the
15 Company's rates of return was higher than the Gas Group and the S&P Public
16 Utilities, thereby signifying higher risk for the Company. And, as I indicated
17 previously, recent changes in the federal income tax law will likely make these
18 variability statistics higher in the future.

19 Operating Ratios. I have also compared operating ratios (the percentage
20 of revenues consumed by operating expense, depreciation, and taxes other than
21 income).[3] The five-year average operating ratios were 76.1% for the Company,
22 85.1% for the Gas Group, and 79.7% for the S&P Public Utilities. The

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

1 Company's average operating ratio was somewhat lower than the Gas Group,
2 thereby indicating lower risk.

3 Coverage. The level of fixed charge coverage (i.e., the multiple by which
4 available earnings cover fixed charges, such as interest expense) provides an
5 indication of the earnings protection for creditors. Higher levels of coverage, and
6 hence earnings protection for fixed charges, are usually associated with superior
7 grades of creditworthiness. Excluding Allowance for Funds Used During
8 Construction ("AFUDC"), the five-year average pre-tax interest coverage was
9 4.31 times for the Company, 4.55 times for the Gas Group, and 3.22 times for the
10 S&P Public Utilities. The average interest coverages were highest for the Gas
11 Group, followed by Peoples and the S&P Public Utilities. As compared to the
12 Gas Group, the Company has higher credit risk. Again, these credit quality
13 indicators will decline prospectively with the implementation of the new lower
14 federal income tax rate.

15 Quality of Earnings. Measures of earnings quality usually are revealed by
16 the percentage of AFUDC related to income available for common equity, the
17 effective income tax rate, and other cost deferrals. These measures of earnings
18 quality usually influence a firm's internally generated funds because poor quality
19 of earnings would not generate high levels of cash flow. Quality of earnings has
20 not been a significant concern for the Company, the Gas Group and the S&P
21 Public Utilities. Prospectively, the effective income tax rate will decline and
22 quality of earnings will suffer.

1 Internally Generated Funds. Internally generated funds ("IGF") provide
2 an important source of new investment capital for a utility and represent a key
3 measure of credit strength. Historically, the five-year average percentage of IGF
4 to capital expenditures was 92.2% for the Company, 71.7% for the Gas Group and
5 79.5% for the S&P Public Utilities. The Company's average IGF to construction
6 percentage has higher than that of the Gas Group, thereby signifying lower risk.
7 As noted previously, the IGF to construction expenditures will decline with the
8 new lower federal income tax rate.

9 Betas. The financial data that I have been discussing relate primarily to
10 company-specific risks. Market risk for firms with publicly-traded stock is
11 measured by beta coefficients. Beta coefficients attempt to identify systematic
12 risk, i.e., the risk associated with changes in the overall market for common
13 equities.[4] Value Line publishes such a statistical measure of a stock's relative
14 historical volatility to the rest of the market. A comparison of market risk is
15 shown by the Value Line beta of 0.67 as the average for the Gas Group (see page
16 2 of Schedule 3) and 0.64 as the average for the S&P Public Utilities (see page 3
17 of Schedule 4).

18 **Q. Please summarize your risk evaluation.**

19 A. The risk of Peoples is greater than that of the Gas Group. Peoples has higher
20 credit risk as measured by its lower coverage and its earnings have been much

[4]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.

1 more variable. Also, the Company's small size adds to its risk. Further, based on
2 the Company's business risk characteristics, especially with regard to the threat of
3 bypass from the interstate pipelines, and other sources of gas its high percentage
4 of throughput to its top ten customers, and its infrastructure needs regarding a
5 replacement of unprotected steel pipe, the Company's overall risk is above that of
6 the Gas Group that is used as a basis to measure the Company's cost of equity.

7 **CAPITAL STRUCTURE RATIOS**

8 **Q. Please explain the selection of capital structure ratios for Peoples.**
9 A. In this case, the capital structure ratios of Peoples have been proposed to calculate
10 the rate of return. I will show that the Company's capital structure ratios
11 proposed in this case are reasonable. Furthermore, consistency requires that the
12 embedded cost rate of the Company's senior securities also be employed.
13 **Q. Does Schedule 5 provide the Company's capitalization and capital structure**
14 **ratios?**
15 A. Yes. Schedule 5 presents the Company's capitalization and related capital
16 structure ratios. The September 30, 2018 capitalization corresponds with the end
17 of the historic test year in this case. The September 30, 2019 capital structure is
18 estimated at the end of the future test year, and the October 31, 2020 capital
19 structure is estimated at the end of the FPFTY. The October 31, 2020 forecast
20 capital structure reflects the issuance of $315 million of new long-term debt, a
21 maturity of $171.045 million of long-term debt, changes in the Intercompany

1 Demand Note, the build-up of retained earnings, and the twelve-month average of
2 the Working Capital Promissory Note that is related to stored gas inventory.

3 **Q. How do the capital structure ratios compare for Peoples and the Gas Group?**

4 A. I have verified the reasonableness of the Company's common equity ratio by
5 considering the historical comparison to the Gas Group. For the historical
6 comparison, the Gas Group had a 52.9% common equity ratio at year-end 2017
7 calculated without short-term debt. The range of ratios was 35.9% to 70.3%.
8 Over the past five years, the average common equity ratio for the Gas Group has
9 been in the range of 52.9% to 54.9%. My comparison of these ratios rest on a
10 calculation without short-term debt because the Company uses a twelve-month
11 average for ratesetting purposes, while the GAAP financial reports for the Gas
12 Group use fiscal year-end balances of short-term debt. For the Company, its
13 FPFTY common equity ratio is 54.32% computed without short-term debt,
14 thereby indicating that the Company's common equity ratio is reasonable.

15 **Q. Does Schedule 5 include a provision for short-term debt?**

16 A. Yes. I have included the average balance of the Working Capital Revolver in the
17 capital structure that is related to stored gas inventory. Short-term debt serves
18 several purposes for a public utility. Principally, it provides bridge financing for
19 construction work in progress, until the magnitude of short-term debt reaches a
20 point where a permanent financing with long-term debt and equity is economic.
21 That is to say, short-term debt is temporary financing pending the issuance of
22 long-term debt and equity in the desired proportions that support the Company's
23 capital structure goals. For natural gas utilities, short-term debt is also used to

1 meet seasonal working capital needs related to stored gas inventory that
2 accumulates during the summer and early fall prior to the send out to customers in
3 the heating session. Short-term debt then declines after customers pay for the gas
4 sold to them. The cycle then repeats. Another use of short-term debt by some
5 natural gas utilities relates to the temporary financing of regulatory assets, such as
6 under-recovered purchased gas costs, deferred environmental remediation costs,
7 and other costs incurred but not yet paid by customers. The bottom line is that
8 short-term debt should be included in the capital structure for rate of return
9 purposes only after a detailed analysis.

10 **Q. What capital structure ratios do you recommend be adopted for rate of**
11 **return purposes in this proceeding?**

12 A. Since ratesetting is prospective, the rate of return should, at a minimum, reflect
13 known or reasonably foreseeable changes which will occur during the course of
14 the FPFTY. As a result, I will adopt the Company's FPFTY capital structure
15 ratios of 45.12%% long-term debt, 1.22% short-term debt, and 53.66% common
16 equity at October 31, 2020. These capital structure ratios are the best
17 approximation of the mix of capital the Company will employ to finance its rate
18 base during the period new rates are in effect.

19 **COSTS OF SENIOR CAPITAL**

20 **Q. What cost rate have you assigned to the debt portion of Peoples' capital**
21 **structure?**

1 A. The determination of the long-term debt cost rate is essentially an arithmetic
2 exercise. This is due to the fact that the Company has contracted for the use of
3 this capital for a specific period of time at a specified cost rate. As shown on page
4 1 of Schedule 6, I have computed the actual embedded cost rate of debt at
5 September 30, 2018. And on page 3 of Schedule 6, the embedded cost of debt is
6 shown at October 31, 2020. By October 31, 2020, the embedded long-term debt
7 cost rate is estimated to be 4.22%, as shown on page 3 of Schedule 6. The
8 FPFTY embedded cost of long-term debt reflects a 5.10% stated interest rate on
9 the proposed issue of $315 million in October 2020. The details leading to the
10 development of the individual effective cost rates for each series of long-term
11 debt, using the cost rate to maturity technique, are shown on page 4 of Schedule 6.
12 The cost rate, or yield to maturity ("ytm"), is the rate of discount that equates the
13 present value of all future interest and principal payments with the net proceeds of
14 the bond.

15 **Q. What cost rate have you assigned to the short-term debt?**

16 A. I have used a cost of short-term debt of 4.69%, which represents the Company's
17 estimate for the FPFTY. The Company obtains its short-term debt from the PNG
18 Companies. The interest rate for this case is established as the one-month LIBOR
19 rate plus a spread of 1.25%.

20 **Q. What overall debt cost rate have you determined for rate of return purposes?**

21 A. As shown on page 3 of Schedule 6, the combined cost of long- and short-term
22 debt is 4.24% for the FPFTY. The 4.24% debt cost rate is related to the amount

1 of total debt shown on Schedule 5 which provides the basis for the 46.34% debt
2 ratio.

3 **COST OF EQUITY – GENERAL APPROACH**

4 **Q. Please describe how you determined the cost of equity for the Company.**

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

11 It is also important to reiterate that no one method or model of the cost of
12 equity can be applied in an isolated manner. Rather, informed judgment must be
13 used to take into consideration the relative risk traits of the firm. It is for this reason
14 that I have used more than one method to measure the Company's cost of equity.
15 As I describe below, each of the methods used to measure the cost of equity
16 contains certain incomplete and/or overly restrictive assumptions and constraints
17 that are not optimal. Therefore, I favor considering the results from a variety of
18 methods. In this regard, I applied each of the methods with data taken from the Gas
19 Group and Subgroup and arrived at a cost of equity of 11.25% for Peoples, which
20 includes recognition of strong management performance.

21 **DISCOUNTED CASH FLOW ANALYSIS**

22 **Q. Please describe the Discounted Cash Flow model.**

1 A. The DCF model seeks to explain the value of an asset as the present value of future
2 expected cash flows discounted at the appropriate risk-adjusted rate of return. In its
3 simplest form, the DCF return on common stock consists of a current cash
4 (dividend) yield and future price appreciation (growth) of the investment. The
5 dividend discount equation is the familiar DCF valuation model and assumes future
6 dividends are systematically related to one another by a constant growth rate. The
7 DCF formula is derived from the standard valuation model: $P = D/(k-g)$, where P =
8 price, D = dividend, k = the cost of equity, and g = growth in cash flows. By
9 rearranging the terms, we obtain the familiar DCF equation: $k= D/P + g$. All of the
10 terms in the DCF equation represent investors' assessment of expected future cash
11 flows that they will receive in relation to the value that they set for a share of stock
12 (P). The DCF equation is sometimes referred to as the "Gordon" model.[5] My DCF
13 results are provided on page 2 of Schedule 1 for the Gas Group. The DCF return is
14 11.19% for the Gas Group and 11.59% for the Subgroup that was used in the
15 Quarterly Earnings Report.
16 Among other limitations of the model, there is a certain element of
17 circularity in the DCF method when applied in rate cases. This is because
18 investors' expectations for the future depend upon regulatory decisions. In turn,
19 when regulators depend upon the DCF model to set the cost of equity, they rely
20 upon investor expectations that include an assessment of how regulators will decide
21 rate cases. Due to this circularity, the DCF model may not fully reflect the true risk

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

1 of a utility.

2 **Q. What is the dividend yield component of a DCF analysis?**

3 A. The dividend yield reveals the portion of investors' cash flow that is generated by
4 the return provided by dividend receipts. It is measured by the dividends per share
5 relative to the price per share. The DCF methodology requires the use of an
6 expected dividend yield to establish the investor-required cost of equity. For the
7 twelve months ended October 2018, the monthly dividend yields are shown on
8 Schedule 7 and reflect an adjustment to the month-end prices to reflect the buildup
9 of the dividend in the price that has occurred since the last ex-dividend date (i.e.,
10 the date by which a shareholder must own the shares to be entitled to the dividend
11 payment – usually about two to three weeks prior to the actual payment).

12 For the twelve months ended October 2018 the average dividend yield was
13 2.74% for the Gas Group and 2.72% for the Subgroup that was used in the
14 Quarterly Earnings Report based upon a calculation using annualized dividend
15 payments and adjusted month-end stock prices. The dividend yields for the more
16 recent six-month period were 2.68% and 2.66%, respectively. I have used, for the
17 purpose of the DCF model, the six-month average dividend yield of 2.68% for the
18 Gas Group and 2.65% for the Subgroup that was used in the Quarterly Earnings
19 Report. The use of this dividend yield will reflect current capital costs, while
20 avoiding spot yields. For the purpose of a DCF calculation, the average dividend
21 yield must be adjusted to reflect the prospective nature of the dividend payments,
22 i.e., the higher expected dividends for the future. Recall that the DCF is an
23 expectational model that must reflect investor anticipated cash flows. I have

1 adjusted the six-month average dividend yield in three different, but generally
2 accepted, manners and used the average of the three adjusted values as calculated in
3 the lower panel of data presented on Schedule 7. This adjustment adds nine basis
4 points to the six-month average historical yield, thus producing the 2.77% adjusted
5 dividend yield for the Gas Group and 2.74% for the Subgroup that was used in the
6 Quarterly Earnings Report.

7 **Q. What factors influence investors' growth expectations?**

8 A. As noted previously, investors are interested principally in the dividend yield and
9 future growth of their investment (i.e., the price per share of the stock). Future
10 earnings per share growth represents the DCF model's primary focus because under
11 the constant price-earnings multiple assumption of the model, the price per share of
12 stock will grow at the same rate as earnings per share. In conducting a growth rate
13 analysis, a wide variety of variables can be considered when reaching a consensus
14 of prospective growth, including: earnings, dividends, book value, and cash flow
15 stated on a per share basis. Historical values for these variables can be considered,
16 as well as analysts' forecasts that are widely available to investors. A fundamental
17 growth rate analysis is sometimes represented by the internal growth ("b x r"),
18 where "r" represents the expected rate of return on common equity and "b" is the
19 retention rate that consists of the fraction of earnings that are not paid out as
20 dividends. To be complete, the internal growth rate should be modified to account
21 for sales of new common stock -- this is called external growth ("s x v"), where "s"
22 represents the new common shares expected to be issued by a firm and "v"
23 represents the value that accrues to existing shareholders from selling stock at a

1 price different from book value. Fundamental growth, which combines internal and
2 external growth, provides an explanation of the factors that cause book value per
3 share to grow over time.

4 Growth also can be expressed in multiple stages. This expression of
5 growth consists of an initial "growth" stage where a firm enjoys rapidly expanding
6 markets, high profit margins, and abnormally high growth in earnings per share.
7 Thereafter, a firm enters a "transition" stage where fewer technological advances
8 and increased product saturation begin to reduce the growth rate and profit margins
9 come under pressure. During the "transition" phase, investment opportunities begin
10 to mature, capital requirements decline, and a firm begins to pay out a larger
11 percentage of earnings to shareholders. Finally, the mature or "steady-state" stage
12 is reached when a firm's earnings growth, payout ratio, and return on equity
13 stabilizes at levels where they remain for the life of a firm. The three stages of
14 growth assume a step-down of high initial growth to lower sustainable growth.
15 Even if these three stages of growth can be envisioned for a firm, the third "steady-
16 state" growth stage, which is assumed to remain fixed in perpetuity, represents an
17 unrealistic expectation because the three stages of growth can be repeated. That is
18 to say, the stages can be repeated where growth for a firm ramps-up and ramps-
19 down in cycles over time. For these reasons, there is no need to analyze growth
20 rates individually for each cycle, but rather to rely upon analysts' growth forecasts,
21 which are those used by investors when pricing common stocks.

22 **Q. What investor-expected growth rate is appropriate in a DCF calculation?**

1 A. Investors consider both company-specific variables and overall market sentiment
2 (i.e., level of inflation rates, interest rates, economic conditions, etc.) when
3 balancing their capital gains expectations with their dividend yield requirements. I
4 follow an approach that is not rigidly formatted because investors are not influenced
5 by a single set of company-specific variables weighted in a formulaic manner.

6 **Q. How did you determine an appropriate growth rate?**

7 A. The growth rate used in a DCF calculation should measure investor expectations.
8 Investors consider both company-specific variables and overall market sentiment
9 (i.e., level of inflation rates, interest rates, economic conditions, etc.) when
10 balancing their capital gains expectations with their dividend yield requirements.
11 Investors are not influenced solely by a single set of company-specific variables
12 weighted in a formulaic manner. Therefore, all relevant growth rate indicators
13 using a variety of techniques must be evaluated when formulating a judgment of
14 investor-expected growth.

15 **Q. What data for the Gas Group have you considered in your growth rate**
16 **analysis?**

17 A. I have considered the growth in the financial variables shown on Schedules 8 and 9.
18 In this regard, I have considered both historical and projected growth rates in
19 earnings per share, dividends per share, book value per share, and cash flow per
20 share for the Gas Group. While analysts will review all measures of growth as I
21 have done, it is earnings per share growth that influences directly the expectations
22 of investors for utility stocks. Forecasts of earnings growth are required within the
23 context of the DCF because the model is a forward-looking concept, and with a

1 constant price-earnings multiple and payout ratio, all other measures of growth will
2 mirror earnings growth. So, with the assumptions underlying the DCF, all forward-
3 looking projections should be similar with a constant price-earnings multiple,
4 earned return, and payout ratio. The historical growth rates were taken from the
5 Value Line publication that provides this data. As to the issue of historical data,
6 investors cannot purchase past earnings of a utility, rather they are only entitled to
7 future earnings. In addition, assigning significant weight to historical performance
8 results in double counting of the historical data. While history cannot be ignored, it
9 is already factored into the analysts' forecasts of earnings growth. In developing a
10 forecast of future earnings growth, an analyst would first apprise himself/herself of
11 the historical performance of a company. Hence, there is no need to count
12 historical growth rates a second time, because historical performance is already
13 reflected in analysts' forecasts which reflect an assessment of how the future will
14 diverge from historical performance. As shown on Schedule 7, the historical
15 growth of earnings per share was in the range of -0.38% to 2.25% for the Gas
16 Group and -2.00% and 1.25% for the Subgroup that was used in the Quarterly
17 Earnings Report.

18 **Q. Is a five-year investment horizon associated with the analysts' forecasts**
19 **consistent with the traditional DCF model?**

20 A. Yes. The constant form of the DCF assumes an infinite stream of cash flows, but
21 investors do not expect to hold an investment indefinitely. Rather than viewing the
22 DCF in the context of an endless stream of growing dividends (e.g., a century of
23 cash flows), the growth in the share value (i.e., capital appreciation, or capital gains

1 yield) is most relevant to investors' total return expectations. Hence, the sale price
2 of a stock can be viewed as a liquidating dividend that can be discounted along with
3 the annual dividend receipts during the investment-holding period to arrive at the
4 investor expected return. The growth in the price per share will equal the growth in
5 earnings per share absent any change in price-earnings ("P-E") multiple -- a
6 necessary assumption of the DCF. As such, my company-specific growth analysis,
7 which focuses principally upon five-year forecasts of earnings per share growth,
8 conforms with the type of analysis that influences the actual total return expectation
9 of investors. Moreover, academic research focuses on five-year growth rates as
10 they influence stock prices. Indeed, if investors really required forecasts which
11 extended beyond five years in order to properly value common stocks, then I am
12 sure that some investment advisory service would begin publishing that information
13 for individual stocks in order to meet the demands of investors. The absence of
14 such a publication suggests that there is no market for this information because
15 investors do not require infinite forecasts in order to purchase and sell stocks in the
16 marketplace.

17 **Q. What are the analysts' forecasts of future growth that you considered?**

18 A. Schedule 9 provides projected earnings per share growth rates taken from analysts'
19 five-year forecasts compiled by IBES/First Call, Reuters, Zacks, Morningstar, SNL,
20 and Value Line. IBES/First Call, Reuters, Zacks, Morningstar, and SNL represent
21 reliable authorities of projected growth upon which investors rely. The IBES/First
22 Call, Reuters, Zacks, and SNL growth rates are consensus forecasts taken from a
23 survey of analysts that make projections of growth for these companies. The

1 IBES/First Call, Reuters, Zacks, Morningstar, and SNL estimates are obtained from
2 the Internet and are widely available to investors. First Call probably is quoted
3 most frequently in the financial press when reporting on earnings forecasts. The
4 Value Line forecasts also are widely available to investors and can be obtained by
5 subscription or free-of-charge at most public and collegiate libraries. The
6 IBES/First Call, Reuters, Zacks, Morningstar, and SNL forecasts are limited to
7 earnings per share growth, while Value Line makes projections of other financial
8 variables. The Value Line forecasts of dividends per share, book value per share,
9 and cash flow per share have also been included on Schedule 9 for the Gas Group
10 and the Subgroup that was used in the Quarterly Earnings Report.

11 **Q. What are the projected growth rates published by the sources you discussed?**

12 A. As to the five-year forecast growth rates, Schedule 9 indicates that the projected
13 earnings per share growth rates for the Gas Group are 6.07% by IBES/First Call,
14 6.16% by Reuters, 6.14% by Zacks, 7.92% by Morningstar, 5.74% by SNL and
15 9.23%% by Value Line. In each instance, the growth rates are the same or higher
16 for the Subgroup that was used in the Quarterly Earnings Report. There, the growth
17 rates range from 6.26% to 9.34%. As noted earlier, with the constant price-earnings
18 multiple assumption of the DCF model, growth for these companies will occur at
19 the higher earnings per share growth rate rather than lower rates of growth in
20 dividends per share and book value per share, thus producing the capital gains yield
21 expected by investors.

22 **Q. What other factors did you consider in developing a growth rate?**

1 A. A variety of factors should be examined to reach a conclusion on the DCF growth
2 rate. However, certain growth rate variables should be emphasized when reaching a
3 conclusion on an appropriate growth rate. From the various alternative measures of
4 growth identified above, earnings per share should receive greatest emphasis.
5 Earnings per share growth are the primary determinant of investors' expectations
6 regarding their total returns in the stock market. This is because the capital gains
7 yield (i.e., price appreciation) will track earnings growth with a constant price
8 earnings multiple (a key assumption of the DCF model). Moreover, earnings per
9 share (derived from net income) are the source of dividend payments and are the
10 primary driver of retention growth and its surrogate, i.e., book value per share
11 growth. As such, under these circumstances, greater emphasis must be placed upon
12 projected earnings per share growth. In this regard, it is worthwhile to note that
13 Professor Myron Gordon, the foremost proponent of the DCF model in rate cases,
14 concluded that the best measure of growth in the DCF model is a forecast of
15 earnings per share growth.[6] Hence, to follow Professor Gordon's findings,
16 projections of earnings per share growth, such as those published by IBES/First
17 Call, Zacks, Morningstar, SNL, and Value Line, represent a reasonable assessment
18 of investor expectations.

19 **Q. What growth rate do you use in your DCF model?**

20 A. The forecasts of earnings per share growth, as shown on Schedule 9, provide a
21 range of average growth rates of 5.74% to 9.23% for the Gas Group and 6.26% to
22 9.34% for the Subgroup that was used in the Quarterly Earnings Report. Although

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

1 the DCF growth rates cannot be established solely with a mathematical formulation,
2 it is my opinion that an investor-expected growth rate of 7.00% is a reasonable
3 estimate of investor expected growth for the Gas Group and is within the array of
4 earnings per share growth rates shown by the analysts' forecasts. Indeed, my
5 7.00% growth rate is obtained from the analysts' growth forecasts that cover a five-
6 year period, which are the growth rates that investors employ for DCF purposes.
7 For the Subgroup that was used in the Quarterly Earnings Report, a higher 7.25% is
8 indicated from the data presented on Schedule 9. Improved economic growth
9 argues for a DCF growth rate near the high end of the range. Economic growth has
10 picked up with the implementation of the new federal corporate income tax
11 provisions.

12 **Q. Are the dividend yield and growth components of the DCF adequate to explain**
13 **the rate of return on common equity when it is used in the calculation of the**
14 **weighted average cost of capital?**

15 A. Only if the capital structure ratios are measured with the market value of debt and
16 equity. In the case of the Gas Group, those average capital structure ratios are
17 30.96% long-term debt, 0.00% preferred stock, and 69.04% common equity, as
18 shown on Schedule 10. If book values are used to compute the capital structure
19 ratios, then a leverage adjustment is required.

20 **Q. What is a leverage adjustment?**

21 A. Where a firm's capitalization as measured by its stock price diverges from its book
22 value capitalization, the potential exists for a financial risk difference, because the
23 capitalization of a utility measured at its market value contains more equity, less

1 debt and therefore less risk than the capitalization measured at its book value. A
2 leverage adjustment accounts for this difference between market value and book
3 value capital structures.

4 **Q. Why is a leverage adjustment necessary?**

5 A. In order to make the DCF results relevant to the capitalization measured at book
6 value (as is done for rate setting purposes) the market-derived cost rate must be
7 adjusted to account for this difference in financial risk. The only perspective that is
8 important to investors is the return that they can realize on the market value of their
9 investment. As I have measured the DCF, the simple yield (D/P) plus growth (g)
10 provides a return applicable strictly to the price (P) that an investor is willing to pay
11 for a share of stock. The need for the leverage adjustment arises when the results of
12 the DCF model (k) are to be applied to a capital structure that is different than
13 indicated by the market price (P). From the market perspective, the financial risk of
14 the Gas Group is accurately measured by the capital structure ratios calculated from
15 the market capitalization of a firm. If the rate setting process utilized the market
16 capitalization ratios, then no additional analysis or adjustment would be required,
17 and the simple yield (D/P) plus growth (g) components of the DCF would satisfy
18 the financial risk associated with the market value of the equity capitalization.
19 Because the rate setting process uses a different set of ratios calculated from the
20 book value capitalization, then further analysis is required to synchronize the
21 financial risk of the book capitalization with the required return on the book value
22 of the equity. This adjustment is developed through precise mathematical
23 calculations, using well recognized analytical procedures that are widely accepted

1 in the financial literature. To arrive at that return, the rate of return on common
2 equity is the unleveraged cost of capital (or equity return at 100% equity) plus one
3 or more terms reflecting the increase in financial risk resulting from the use of
4 leverage in the capital structure. The calculations presented in the lower panel of
5 data shown on Schedule 10, under the heading "M&M," provides a return of 8.34%
6 when applicable to a capital structure with 100% common equity.

7 **Q. Are there specific factors that influence market-to-book ratios that determine**
8 **whether the leverage adjustment should be made?**

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

19 Further, as noted previously, the relatively high market prices of utility
20 stocks cannot be attributed solely to the notion that these companies are expected to
21 earn a return on the book value of equity that differs from their cost of equity
22 determined from stock market prices. Stock prices above book value are common
23 for utility stocks, and indeed the stock prices of non-regulated companies exceed

1 book values by even greater margins. It is difficult to accept that the vast majority
2 of all firms operating in our economy are generating returns far in excess of their
3 cost of capital. Certainly, in our free-market economy, competition should contain
4 such "excesses" if they indeed exist.

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

11 **Q. Is the leverage adjustment that you propose designed to transform the market**
12 **return into one that is designed to produce a particular market-to-book ratio?**

13 A. No, it is not. The adjustment that I label as a "leverage adjustment" is merely a
14 convenient way of showing the amount that must be added to (or subtracted from)
15 the result of the simple DCF model (i.e., D/P + g), in the context of a return that
16 applies to the capital structure used in ratemaking, which is computed with book
17 value weights rather than market value weights, in order to arrive at the utility's
18 total cost of equity. I specify a separate factor, which I call the leverage adjustment,
19 but there is no need to do so other than providing identification for this factor. If I
20 expressed my return solely in the context of the book value weights that we use to
21 calculate the weighted average cost of capital and ignore the familiar D/P + g
22 expression entirely, then there would be no separate element to reflect the financial
23 leverage change from market value to book value capitalization. As shown in the

1 bottom panel of data on Schedule 10, the equity return applicable to the book value
2 common equity ratio is equal to 8.34%, which is the return for the Gas Group
3 applicable to its equity with no debt in its capital structure (i.e., the cost of capital is
4 equal to the cost of equity with a 100% equity ratio) plus 2.85% compensation for
5 having a 47.30% debt ratio, plus 0.00% for having a 0.00% preferred stock ratio.
6 The sum of the parts is 11.19% (8.34% + 2.85% + 0.00%) and there is no need to
7 even address the cost of equity in terms of D/P + g. To express this same return in
8 the context of the familiar DCF model, I summed the 2.77% dividend yield, the
9 7.00% growth rate, and the 1.42% for the leverage adjustment in order to arrive at
10 the same 11.19% (2.77% + 7.00% + 1.42%) return. I know of no means to
11 mathematically solve for the 1.42% leverage adjustment by expressing it in the
12 terms of any particular relationship of market price to book value. The 1.42%
13 adjustment is merely a convenient way to compare the 11.19% return computed
14 directly with the Modigliani & Miller formulas to the 9.77% return generated by the
15 DCF model (i.e., D_1/P_0 + g, or the traditional form of the DCF -- see page 1 of
16 Schedule 7) based on a market value capital structure. A 9.11% return assigned to
17 anything other than the market value of equity cannot equate to a reasonable return
18 on book value that has higher financial risk. My point is that when we use a
19 market-determined cost of equity developed from the DCF model, it reflects a level
20 of financial risk that is different (in this case, lower) from the capital structure stated
21 at book value. This process has nothing to do with targeting any particular market-
22 to-book ratio. I have applied the same process to the Subgroup that was used in the

1 Quarterly Earnings Report and established a 1.60% leverage adjustment for that
2 group.

3 **Q. Please provide the DCF return based upon your preceding discussion of**
4 **dividend yield, growth, and leverage.**

5 A. As explained previously, I have utilized a six-month average dividend yield
6 ("D_1/P_0") adjusted in a forward-looking manner for my DCF calculation. This
7 dividend yield is used in conjunction with the growth rate ("g") previously
8 developed. The DCF also includes the leverage modification ("lev.") required when
9 the book value equity ratio is used in determining the weighted average cost of
10 capital in the ratesetting process rather than the market value equity ratio related to
11 the price of stock. The resulting DCF cost rate is:

	D_1/P_0	+	***g***	+	***lev.***	=	***k***
Gas Group	2.77%	+	7.00%	+	1.42%	=	11.19%
Subgroup	2.74%	+	7.25%	+	1.60%	=	11.59%

12 The DCF result shown above represents the simplified (i.e., Gordon) form
13 of the model that contains a constant growth assumption. I should reiterate,
14 however, that the DCF-indicated cost rate provides an explanation of the rate of
15 return on common stock market prices without regard to the prospect of a change in
16 the price-earnings multiple. An assumption that there will be no change in the
17 price-earnings multiple is not supported by the realities of the equity market,
18 because price-earnings multiples do not remain constant. This is one of the
19 constraints of this model that makes it important to consider other model results
20 when determining a company's cost of equity.

1 **RISK PREMIUM ANALYSIS**

2 **Q. Please describe your use of the risk premium approach to determine the cost of**
3 **equity.**

4 A. With the Risk Premium approach, the cost of equity capital is determined by
5 corporate bond yields plus a premium to account for the fact that common equity is
6 exposed to greater investment risk than debt capital. The result of my Risk
7 Premium study is shown on page 2 of Schedule 1. That result is 11.50%.

8 **Q. What long-term public utility debt cost rate did you use in your risk premium**
9 **analysis?**

10 A. In my opinion, and as I will explain in more detail further in my testimony, a 5.00%
11 yield represents a reasonable estimate of the prospective yield on long-term A-rated
12 public utility bonds.

13 **Q. What historical data is shown by the Moody's data?**

14 A. I have analyzed the historical yields on the Moody's index of long-term public
15 utility debt as shown on page 1 of Schedule 11. For the twelve months ended
16 October 2018, the average monthly yield on Moody's index of A-rated public utility
17 bonds was 4.14%. For the six and three-month periods ended October 2018, the
18 yields were 4.31% and 4.34%, respectively. During the twelve-months ended
19 October 2018, the range of the yields on A-rated public utility bonds was 3.79% to
20 4.45%. Page 2 of Schedule 11 shows the long-run spread in yields between A-rated
21 public utility bonds and long-term Treasury bonds. As shown on page 3 of
22 Schedule 11, the yields on A-rated public utility bonds have exceeded those on
23 Treasury bonds by 1.11% on a twelve-month average basis, 1.19% on a six-month

1 average basis, and 1.17% on a three-month average basis. From these averages,
2 1.25% represents a reasonable spread for the yield on A-rated public utility bonds
3 over Treasury bonds.

4 **Q. What forecasts of interest rates have you considered in your analysis?**

5 A. I have determined the prospective yield on A-rated public utility debt by using the
6 Blue Chip Financial Forecasts ("Blue Chip") along with the spread in the yields that
7 I describe below. The Blue Chip is a reliable authority and contains consensus
8 forecasts of a variety of interest rates compiled from a panel of banking, brokerage,
9 and investment advisory services. In early 1999, Blue Chip stopped publishing
10 forecasts of yields on A-rated public utility bonds because the Federal Reserve
11 deleted these yields from its Statistical Release H.15. To independently project a
12 forecast of the yields on A-rated public utility bonds, I have combined the forecast
13 yields on long-term Treasury bonds published on November 1, 2018, and a yield
14 spread of 1.25%, derived from historical data.

15 **Q. How have you used these data to project the yield on A-rated public utility**
16 **bonds for the purpose of your Risk Premium analyses?**

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

		Corporate		30-Year	A-rated Public Utility	
Year	Quarter	Aaa-rated	Baa-rated	Treasury	Spread	Yield
2018	Fourth	4.2%	5.1%	3.3%	1.25%	4.55%
2019	First	4.5%	5.3%	3.5%	1.25%	4.75%
2019	Second	4.6%	5.4%	3.6%	1.25%	4.85%
2019	Third	4.7%	5.5%	3.6%	1.25%	4.85%
2019	Fourth	4.7%	5.6%	3.7%	1.25%	4.95%
2020	First	4.7%	5.6%	3.7%	1.25%	4.95%

1 **Q. Are there additional forecasts of interest rates that extend beyond those shown**
2 **above?**
3 A. Yes. Twice yearly, Blue Chip provides long-term forecasts of interest rates. In its
4 June 1, 2018 publication, Blue Chip published longer-term forecasts of interest
5 rates, which were reported to be:

	Blue Chip Financial Forecasts		
	Corporate		30-Year
Averages	Aaa-rated	Baa-rated	Treasury
2020-2024	5.3%	6.1%	4.2%
2025-2029	5.4%	6.3%	4.4%

6 The longer-term forecasts by Blue Chip suggest that interest rates will
7 move up from the levels revealed by the near-term forecasts. By focusing more on
8 these forecasts, a 5.00% yield on A-rated public utility bonds represents a
9 reasonable benchmark for measuring the cost of equity in this case. In reaching my
10 conclusion as to a prospective yield on A-rated public utility debt, I have considered
11 the data relied upon by investors.
12 **Q. What equity risk premium have you determined for public utilities?**

1 A. To develop an appropriate equity risk premium, I analyzed the results from 2017
2 SBBI Yearbook, Stocks, Bonds, Bills and Inflation. My investigation reveals that
3 the equity risk premium varies according to the level of interest rates. That is to
4 say, the equity risk premium increases as interest rates decline and it declines as
5 interest rates increase. This inverse relationship is revealed by the summary data
6 presented below and shown on page 1 of Schedule 12.

Common Equity Risk Premiums		
Low Interest Rates		7.08%
Average Across All Interest Rates		5.64%
High Interest Rates		4.18%

7 Based on my analysis of the historical data, the equity risk premium was
8 7.08% when the marginal cost of long-term government bonds was low (i.e.,
9 2.96%, which was the average yield during periods of low rates). Conversely, when
10 the yield on long-term government bonds was high (i.e., 7.22% on average during
11 periods of high interest rates) the spread narrowed to 4.18%. Over the entire
12 spectrum of interest rates, the equity risk premium was 5.64% when the average
13 government bond yield was 5.07%. With the forecast indicating an upward
14 movement of interest rates that I described above from historically low levels, I
15 have utilized a 6.50% equity risk premium. This equity risk premium is between
16 the 7.08% premium related to periods of low interest rates and the 5.64% premium
17 related to average interest rates across all levels.

18 **Q. What common equity cost rate did you determine based on your risk premium**
19 **analysis?**

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

	i	+	*RP*	=	*k*
Gas Group and Subgroup	5.00%	+	6.50%	=	11.50%

4 **CAPITAL ASSET PRICING MODEL**

5 **Q. How is the CAPM used to measure the cost of equity?**
6 A. The CAPM uses the yield on a risk-free interest-bearing obligation plus a rate of
7 return premium that is proportional to the systematic risk of an investment. As
8 shown on page 2 of Schedule 1, the result of the CAPM is 11.96% for both the Gas
9 Group and the Subgroup that was used in the Quarterly Earnings Report. To
10 compute the cost of equity with the CAPM, three components are necessary: a risk-
11 free rate of return ("Rf"), the beta measure of systematic risk ("β"), and the market
12 risk premium ("Rm-Rf") derived from the total return on the market of equities
13 reduced by the risk-free rate of return. The CAPM specifically accounts for
14 differences in systematic risk (i.e., market risk as measured by the beta) between an
15 individual firm or group of firms and the entire market of equities.
16 **Q. What betas have you considered in the CAPM?**
17 A. For my CAPM analysis, I initially considered the Value Line betas. As shown on
18 page 2 of Schedule 3, the average beta is 0.67 for the Gas Group and 0.66 for the
19 Subgroup that was used in the Quarterly Earnings Report.
20 **Q. Did you use the Value Line betas in the CAPM determined cost of equity?**

1 A. I used the Value Line betas as a foundation for the leverage adjusted betas that I
2 used in the CAPM. The betas must be reflective of the financial risk associated
3 with the rate setting capital structure that is measured at book value. Therefore,
4 Value Line betas cannot be used directly in the CAPM, unless the cost rate
5 developed using those betas is applied to a capital structure measured with market
6 values. To develop a CAPM cost rate applicable to a book-value capital structure,
7 the Value Line (market value) betas have been unleveraged and re-leveraged for the
8 book value common equity ratios using the Hamada formula,[7] as follows:

9 $$\beta l = \beta u\ [1 + (1 - t)\ D/E + P/E]$$

10 where ßl = the leveraged beta, ßu = the unleveraged beta, t = income tax
11 rate, D = debt ratio, P = preferred stock ratio, and E = common equity ratio. The
12 betas published by Value Line have been calculated with the market price of stock
13 and are related to the market value capitalization. By using the formula shown
14 above and the capital structure ratios measured at market value, the beta would
15 become 0.49 for the Gas Group if it employed no leverage and was 100% equity
16 financed. Those calculations are shown on Schedule 10 under the section labeled
17 "Hamada" who is credited with developing those formulas. With the unleveraged
18 beta as a base, I calculated the leveraged beta of 0.84 for the book value capital
19 structure of the Gas Group. The book value leveraged beta that I will employ in the

[7] 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, December 27-29, 1971. (May 1972), pp. 435-452.

1 CAPM cost of equity is 0.84 for the Subgroup that was used in the Quarterly
2 Earnings Report.

3 **Q. What risk-free rate have you used in the CAPM?**

4 A. As shown on page 1 of Schedule 13, I provided the historical yields on Treasury
5 notes and bonds. For the twelve months ended October 2018, the average yield on
6 30-year Treasury bonds was 3.04%. For the six- and three-months ended October
7 2018, the yields on 30-year Treasury bonds were 3.12% and 3.18%, respectively.
8 During the twelve-months ended October 2018, the range of the yields on 30-year
9 Treasury bonds was 2.77% to 3.34%. The low yields that existed during recent
10 periods can be traced to the financial crisis and its aftermath commonly referred to
11 as the Great Recession. The resulting decline in the yields on Treasury obligations
12 was attributed to a number of factors, including: the sovereign debt crisis in the
13 euro zone, concern over a possible double dip recession, the potential for deflation,
14 and the Federal Reserve's large balance sheet that was expanded through the
15 purchase of Treasury obligations and mortgage-backed securities (also known as
16 QEI, QEII, and QEIII), and the reinvestment of the proceeds from maturing
17 obligations and the lengthening of the maturity of the Fed's bond portfolio through
18 the sale of short-term Treasuries and the purchase of long-term Treasury obligations
19 (also known as "operation twist"). As noted previously, low interest rates were the
20 product of the policy of the Federal Open Market Committee ("FOMC") in its
21 attempt to deal with stagnant job growth, which is part of its dual mandate. The
22 FOMC ended its bond purchasing program at its policy meeting on October 29,
23 2014. At its December 16, 2015 meeting, the FOMC increased the federal funds

1 rate range by 0.25 percentage points. On December 14, 2016, the FOMC acted
2 again by raising the federal funds rate by one-quarter percentage point. The FOMC
3 also used this occasion to express a more aggressive approach to future increases in
4 interest rates. In addition, the Fed has indicated that it will reduce the size of its
5 balance sheet. FOMC increased the federal funds rate on three occasions in 2017
6 (i.e., March 15, 2017, June 14, 2017 and December 13, 2017) by one-quarter
7 percentage point each. At its policy meetings on March 21, 2018, June 13, 2018,
8 September 26, 2018, and December 19, 2018, the FOMC acted again to increase the
9 federal funds rate by one-quarter percentage point in each instance. There have
10 been nine (9) one-quarter percentage point increases in the Fed Funds rate since the
11 FOMC began to normalize interest rates following the financial crisis and the Great
12 Recession. Going forward, there is an expectation of additional rate increases in
13 2019. Additional increases may be expected depending upon the rate of increase in
14 price levels. This buttresses the prospect that higher interest rates are on the
15 horizon.

16 As shown on page 2 of Schedule 13, forecasts published by Blue Chip on
17 November 1, 2018 indicate that the yields on long-term Treasury bonds are
18 expected to be in the range of 3.3% to 3.7% during the next six quarters. The
19 longer-term forecasts described previously show that the yields on 30-year Treasury
20 bonds will average 4.2% from 2020 through 2024 and 4.4% from 2025 to 2029.
21 For the reasons explained previously, forecasts of interest rates should be
22 emphasized at this time in selecting the risk-free rate of return in CAPM. Hence, I

1 have used a 3.75% risk-free rate of return for CAPM purposes, which considers the
2 Blue Chip forecasts.

3 **Q. What market premium have you used in the CAPM?**

4 A. As shown in the lower panel of data presented on page 2 of Schedule 13, the market
5 premium is derived from historical data and the forecast returns. For the
6 historically based market premium, I have used the arithmetic mean obtained from
7 the data presented on page 1 of Schedule 12. On that schedule, the market return
8 was 11.97% on large stocks during periods of low interest rates. During those
9 periods, the yield on long-term government bonds was 2.96% when interest rates
10 were low. As I describe above, interest rates are forecast to trend upward in the
11 future. To recognize that trend, I have given weight to the average returns and
12 yields that existed across all interest rate levels. As such, I carried over to page 2 of
13 Schedule 13 the average large common stock returns of 11.96% (11.97% + 11.95%
14 = 23.92% ÷ 2) and the average yield on long-term government bonds of 4.02%
15 (2.96% + 5.07% = 8.03% ÷ 2). These financial returns rest between those
16 experienced during periods of low interest rates and those experienced across all
17 levels of interest rates. The resulting market premium is 7.94% (11.96% - 4.02%)
18 based on historical data, as shown on page 2 of Schedule 13. As also shown on
19 page 2 of Schedule 13, I calculated the forecast returns, which show an 12.87%
20 total market return from the Value Line data and a DCF return of 12.98% for the
21 S&P 500. With the average forecast return of 12.93% (12.87% + 12.98% = 25.85%
22 ÷ 2), I calculated a market premium of 9.18% (12.93% - 3.75%) using forecast data.

1 The market premium applicable to the CAPM derived from these sources equals
2 8.56% (9.18% + 7.94% = 17.12% ÷ 2).

3 **Q. Are there adjustments to the CAPM that are necessary to fully reflect the rate**
4 **of return on common equity?**

5 A. Yes. The technical literature supports an adjustment relating to the size of the
6 company or portfolio for which the calculation is performed. As the size of a firm
7 decreases, its risk and required return increases. Moreover, in his discussion of the
8 cost of capital, Professor Brigham has indicated that smaller firms have higher
9 capital costs than otherwise similar larger firms. Also, the Fama/French study (see
10 "The Cross-Section of Expected Stock Returns"; The Journal of Finance, June
11 1992) established that the size of a firm helps explain stock returns. In an October
12 15, 1995 article in Public Utility Fortnightly, entitled "Equity and the Small-Stock
13 Effect," it was demonstrated that the CAPM could understate the cost of equity
14 significantly according to a company's size. Indeed, it was demonstrated in the
15 SBBI Yearbook that the returns for stocks in lower deciles (i.e., smaller stocks) had
16 returns in excess of those shown by the simple CAPM. In this regard, the Gas
17 Group has a market-based average equity capitalization of $4,209 million. For my
18 CAPM analysis, I have adopted a mid-cap adjustment of 1.02%, as shown on page
19 3 of Schedule 13.

20 **Q. What does your CAPM analysis show?**

21 A. Using the 3.75% risk-free rate of return, the leverage adjusted beta of 0.84 for the
22 Gas Group, the 8.56% market premium, and the 1.02% size adjustment, the
23 following result is indicated.

	Rf	+	*ß*	x (	*Rm-Rf*	) +	*size*	=	*k*
Gas Group and Subgroup	3.75%	+	0.84	x (	8.56%	) +	1.02%	=	11.96%

1 <u>**COMPARABLE EARNINGS APPROACH**</u>

2 **Q. What is the Comparable Earnings approach?**

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

12 There are two avenues available to implement the Comparable Earnings
13 approach. One method involves the selection of another industry (or industries)
14 with comparable risks to the public utility in question, and the results for all
15 companies within that industry serve as a benchmark. The second approach
16 requires the selection of parameters that represent similar risk traits for the public
17 utility and the comparable risk companies. Using this approach, the business lines
18 of the comparable companies become unimportant. The latter approach is
19 preferable with the further qualification that the comparable risk companies exclude
20 regulated firms in order to avoid the circular reasoning implicit in the use of the

1 achieved earnings/book ratios of other regulated firms. The United States Supreme
2 Court has held that:

> 3 A public utility is entitled to such rates as will permit it to
> 4 earn a return on the value of the property which it employs
> 5 for the convenience of the public equal to that generally
> 6 being made at the same time and in the same general part of
> 7 the country on investments in other business undertakings
> 8 which are attended by corresponding risks and
> 9 uncertainties. The return should be reasonably sufficient to
> 10 assure confidence in the financial soundness of the utility
> 11 and should be adequate, under efficient and economical
> 12 management, to maintain and support its credit and enable
> 13 it to raise the money necessary for the proper discharge of
> 14 its public duties. <u>Bluefield Water Works vs. Public Service</u>
> 15 <u>Commission, 262 U.S. 668 (1923)</u>.

16

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

20 **Q. Did you compare the results of your DCF and CAPM analyses to the results**
21 **indicated by a Comparable Earnings approach?**

22 A. Yes. I selected companies from <u>The Value Line Investment Survey for Windows</u>
23 that have six categories of comparability designed to reflect the risk of the Gas
24 Group. These screening criteria were based upon the range as defined by the
25 rankings of the companies in the Gas Group. The items considered were:
26 Timeliness Rank, Safety Rank, Financial Strength, Price Stability, <u>Value Line</u> betas,
27 and Technical Rank. The definition for these parameters is provided on page 3 of
28 Schedule 14. The identities of the companies comprising the Comparable Earnings
29 group and their associated rankings within the ranges are identified on page 1 of
30 Schedule 14.

1 Value Line data was relied upon because it provides a comprehensive basis
2 for evaluating the risks of the comparable firms. As to the returns calculated by
3 Value Line for these companies, there is some downward bias in the figures shown
4 on page 2 of Schedule 14, because Value Line computes the returns on year-end
5 rather than average book value. If average book values had been employed, the
6 rates of return would have been slightly higher. Nevertheless, these are the returns
7 considered by investors when taking positions in these stocks. Because many of the
8 comparability factors, as well as the published returns, are used by investors in
9 selecting stocks, and the fact that investors rely on the Value Line service to gauge
10 returns, it is an appropriate database for measuring comparable return opportunities.

11 **Q. What data did you consider in your Comparable Earnings analysis?**

12 A. I used both historical realized returns and forecasted returns for non-utility
13 companies. As noted previously, I have not used returns for utility companies in
14 order to avoid the circularity that arises from using regulatory-influenced returns to
15 determine a regulated return. It is appropriate to consider a relatively long
16 measurement period in the Comparable Earnings approach in order to cover
17 conditions over an entire business cycle. A ten-year period (five historical years
18 and five projected years) is sufficient to cover an average business cycle. Unlike
19 the DCF and CAPM, the results of the Comparable Earnings method can be applied
20 directly to the book value capitalization. In other words, the Comparable Earnings
21 approach does not contain the potential misspecification contained in market
22 models when the market capitalization and book value capitalization diverge
23 significantly. A point of demarcation was chosen to eliminate the results of highly

1 profitable enterprises, which the Bluefield case stated were not the type of returns
2 that a utility was entitled to earn. For this purpose, I used 20% as the point where
3 those returns could be viewed as highly profitable and should be excluded from the
4 Comparable Earnings approach. The average historical rate of return on book
5 common equity was 11.8% using only the returns that were less than 20%, as
6 shown on page 2 of Schedule 14. The average forecasted rate of return as published
7 by Value Line is 13.1% also using values less than 20%, as provided on page 2 of
8 Schedule 14. Using the average of these data my Comparable Earnings result is
9 12.45%, as shown on page 2 of Schedule 1.

10 **CONCLUSION ON COST OF EQUITY**

11 **Q. What is your conclusion regarding the Company's cost of common equity?**

12 A. Based upon the application of a variety of methods and models described
13 previously, it is my opinion that a reasonable rate of return on common equity is
14 11.25% for Peoples, which includes 25 basis points or 0.25% for recognition of the
15 Company's strong management performance. My cost of equity recommendation is
16 within the range of results and should be considered in the context of the
17 Company's risk characteristics, as well as the general condition of the capital
18 markets. It is essential that the Commission employ a variety of techniques to
19 measure the Company's cost of equity because of the limitations/infirmities that are
20 inherent in each method. In summary, the Company should be provided an
21 opportunity to realize an 11.25% rate of return on common equity so that it can
22 compete in the capital markets, attain reasonable credit quality, sustain its cash flow

1 in the context of the TCJA, and receive recognition of the significant
2 accomplishments that management has achieved.

3 **Q. Does this complete your direct testimony?**

4 A. Yes. However, I reserve the right to supplement my testimony, if necessary, and to
5 respond to witnesses presented by other parties.

APPENDIX A TO DIRECT TESTIMONY OF PAUL R. MOUL

1 **EDUCATIONAL BACKGROUND, BUSINESS EXPERIENCE**
2 **AND QUALIFICATIONS**

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

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

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

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

20 In 1994, I formed P. Moul & Associates, an independent financial and regulatory
21 consulting firm. In my capacity as Managing Consultant and for the past forty-one years, I
22 have continuously studied the rate of return requirements for cost of service-regulated firms.
23 In this regard, I have supervised the preparation of rate of return studies, which were
24 employed, in connection with my testimony and in the past for other individuals. I have

1 presented direct testimony on the subject of fair rate of return, evaluated rate of return
2 testimony of other witnesses, and presented rebuttal testimony.

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

20 I was a co-author of a verified statement submitted to the Interstate Commerce
21 Commission concerning the 1983 Railroad Cost of Capital (Ex Parte No. 452). I was also
22 co-author of comments submitted to the Federal Energy Regulatory Commission regarding
23 the Generic Determination of Rate of Return on Common Equity for Public Utilities in

1 1985, 1986 and 1987 (Docket Nos. RM85-19-000, RM86-12-000, RM87-35-000 and
2 RM88-25-000). Further, I have been the consultant to the New York Chapter of the
3 National Association of Water Companies, which represented the water utility group in the
4 Proceeding on Motion of the Commission to Consider Financial Regulatory Policies for
5 New York Utilities (Case 91-M-0509). I have also submitted comments to the Federal
6 Energy Regulatory Commission in its Notice of Proposed Rulemaking (Docket No. RM99-
7 2-000) concerning Regional Transmission Organizations and on behalf of the Edison
8 Electric Institute in its intervention in the case of Southern California Edison Company
9 (Docket No. ER97-2355-000). Also, I was a member of the panel of participants at the
10 Technical Conference in Docket No. PL07-2 on the Composition of Proxy Groups for
11 Determining Gas and Oil Pipeline Return on Equity.

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

20 I have been a consultant to the Bucks County Water and Sewer Authority concerning rates
21 and charges for wholesale contract service with the City of Philadelphia. My municipal
22 consulting experience also included an assignment for Baltimore County, Maryland,
23 regarding the City/County Water Agreement for Metropolitan District customers (Circuit

1 Court for Baltimore County in Case 34/153/87-CSP-2636).

Exhibit PRM-1

PEOPLES NATURAL GAS COMPANY LLC

EXHIBIT

TO ACCOMPANY

THE DIRECT TESTIMONY

OF

PAUL R. MOUL

CONCERNING
RATE OF RETURN

January 28, 2019

Peoples Natural Gas Company LLC
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Peoples Natural Gas Company LLC

Summary Cost of Capital

Estimated at October 31, 2020

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Debt	46.34%	4.24%	1.96%
Equity	53.66%	11.25%	6.04%
Total	100.00%		8.00%

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 28.8921% composite federal and state income tax rate
(10.45% ÷ 1.96%) 5.33 x

Post-tax coverage of interest expense
(8.00% ÷ 1.96%) 4.08 x

Peoples Natural Gas Company LLC
Cost of Equity
as of October 31, 2018

Discounted Cash Flow (DCF)					D_1/P_0 [1]	+	g [2]	+	*lev.* [3]	=	*k*
Gas Group					2.77%	+	7.00%	+	1.42%	=	11.19%
Excl. OGS, SWX and SR					2.74%	+	7.25%	+	1.60%	=	11.59%
Risk Premium (RP)							*I* [5]	+	*RP* [6]	=	*k*
Gas Group							5.00%	+	6.50%	=	11.50%
Excl. OGS, SWX and SR							5.00%	+	6.50%	=	11.50%
Capital Asset Pricing Model (CAPM)	*Rf* [7]	+	*ß* [8]		x (		*Rm-Rf* [9]	) +	*size* [10]	=	*k*
Gas Group	3.75%	+	0.84		x (		8.56%	) +	1.02%	=	11.96%
Excl. OGS, SWX and SR	3.75%	+	0.84		x (		8.56%	) +	1.02%	=	11.96%
Comparable Earnings (CE) [11]							***Historical***		***Forecast***		***Average***
Comparable Earnings Group							11.8%		13.1%		12.45%

References:
[1] Schedule 07
[2] Schedule 09
[3] Schedule 10
[4] Schedule 11
[5] A-rated public utility bond yield comprised of a 3.75% risk-free rate of return (Schedule 14 page 2) and a yield spread of 1.25% (Schedule 12 page 3)
[6] Schedule 13 page 1
[7] Schedule 14 page 2
[8] Schedule 10
[9] Schedule 14 page 2
[10] Schedule 14 page 3
[11] Schedule 15 page 2

Peoples Natural Gas Company LLC
Capitalization and Financial Statistics
2013-2017, Inclusive

	2017	2016	2015	2014	2013	
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 1,783.8	$ 1,640.8	$ 1,606.5	$ 1,614.2	$ 1,606.7	
Short-Term Debt	$ 71.2	$ 66.1	$ 50.3	$ 109.7	$ 100.2	
Total Capital	$ 1,855.0	$ 1,706.8	$ 1,656.8	$ 1,723.9	$ 1,706.9	
						Average
Capital Structure Ratios						
Based on Permanent Capital:						
Long-Term Debt	48.5%	47.8%	48.7%	48.8%	49.0%	48.6%
Common Equity [1]	51.5%	52.2%	51.3%	51.2%	51.0%	51.4%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt, incl. Short Term	50.5%	49.8%	50.2%	52.1%	52.0%	50.9%
Common Equity [1]	49.5%	50.2%	49.8%	47.9%	48.0%	49.1%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [1]	8.3%	8.6%	10.3%	10.3%	6.6%	8.8%
Operating Ratio [2]	75.3%	72.5%	78.2%	78.6%	76.0%	76.1%
Coverage incl. AFUDC [3]						
Pre-tax: All Interest Charges	5.01 x	4.27 x	4.10 x	4.30 x	3.88 x	4.31 x
Post-tax: All Interest Charges	3.26 x	2.95 x	3.31 x	3.07 x	2.56 x	3.03 x
Coverage excl. AFUDC [3]						
Pre-tax: All Interest Charges	5.01 x	4.27 x	4.10 x	4.30 x	3.88 x	4.31 x
Post-tax: All Interest Charges	3.26 x	2.95 x	3.31 x	3.07 x	2.56 x	3.03 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Effective Income Tax Rate	43.6%	40.5%	25.6%	37.3%	45.8%	38.6%
Internal Cash Generation/Construction [4]	95.9%	121.1%	64.1%	102.9%	76.8%	92.2%
Gross Cash Flow/ Avg. Total Debt [5]	19.9%	21.4%	18.4%	19.8%	15.3%	19.0%
Gross Cash Flow Interest Coverage [6]	5.47 x	5.79 x	4.94 x	5.26 x	4.65 x	5.22 x
Common Dividend Coverage [7]	13.92 x	4.49 x	1.85 x	2.28 x	3.49 x	5.21 x

See Page 2 for Notes.

Peoples Natural Gas Company LLC
Capitalization and Financial Statistics
2013-2017, 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.

Source of Information: Company provided data

Gas Group
Capitalization and Financial Statistics [1]
2013-2017, Inclusive

	2017	2016	2015	2014	2013	
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 4,133.8	$ 3,746.8	$ 3,522.8	$ 3,920.8	$ 3,454.2	
Short-Term Debt	$ 402.2	$ 393.6	$ 259.5	$ 330.8	$ 288.8	
Total Capital	$ 4,536.0	$ 4,140.4	$ 3,782.3	$ 4,251.6	$ 3,743.0	
Market-Based Financial Ratios						Average
Price-Earnings Multiple	28 x	22 x	23 x	19 x	18 x	22 x
Market/Book Ratio	224.2%	201.9%	187.7%	187.0%	177.2%	195.6%
Dividend Yield	2.6%	2.8%	3.0%	3.0%	3.4%	3.0%
Dividend Payout Ratio	69.5%	60.7%	67.7%	58.2%	57.9%	62.8%
Capital Structure Ratios						
Based on Permanent Capital:						
Long-Term Debt	47.1%	45.0%	45.9%	46.8%	46.0%	46.2%
Preferred Stock	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
Common Equity [2]	52.9%	54.9%	54.0%	53.2%	54.0%	53.8%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt incl. Short Term	53.0%	50.5%	51.3%	51.6%	52.5%	51.8%
Preferred Stock	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
Common Equity [2]	47.0%	49.5%	48.7%	48.4%	47.5%	48.2%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [2]	8.0%	9.2%	9.4%	9.8%	9.6%	9.2%
Operating Ratio [3]	84.1%	82.9%	85.0%	86.6%	86.9%	85.1%
Coverage incl. AFUDC [4]						
Pre-tax: All Interest Charges	4.22 x	4.88 x	4.85 x	4.71 x	4.36 x	4.60 x
Post-tax: All Interest Charges	3.31 x	3.58 x	3.62 x	3.51 x	3.38 x	3.48 x
Overall Coverage: All Int. & Pfd. Div.	3.31 x	3.58 x	3.62 x	3.51 x	3.38 x	3.48 x
Coverage excl. AFUDC [4]						
Pre-tax: All Interest Charges	4.19 x	4.82 x	4.79 x	4.67 x	4.29 x	4.55 x
Post-tax: All Interest Charges	3.27 x	3.52 x	3.57 x	3.47 x	3.31 x	3.43 x
Overall Coverage: All Int. & Pfd. Div.	3.27 x	3.52 x	3.57 x	3.47 x	3.31 x	3.43 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	-4.2%	2.3%	2.4%	1.7%	2.6%	1.0%
Effective Income Tax Rate	39.7%	33.6%	32.6%	32.3%	27.4%	33.1%
Internal Cash Generation/Construction [5]	59.7%	71.8%	71.2%	85.1%	70.5%	71.7%
Gross Cash Flow/ Avg. Total Debt [6]	21.5%	23.8%	22.9%	24.4%	22.9%	23.1%
Gross Cash Flow Interest Coverage [7]	6.75 x	7.39 x	7.00 x	7.15 x	6.50 x	6.96 x
Common Dividend Coverage [8]	4.23 x	4.63 x	4.51 x	5.08 x	6.19 x	4.93 x

See Page 2 for Notes.

Gas Group
Capitalization and Financial Statistics
2013-2017, 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, 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.	A2	A	NYSE	0.60
CPK	Chesapeake Utilities Corp.			NYSE	0.70
NJR	New Jersey Resources Corp.	Aa2	BBB+	NYSE	0.70
NI	NiSource Inc.	Baa2	BBB+	NYSE	0.55
NWN	Northwest Natural Holding Compa	A3	A+	NYSE	0.65
OGS	ONE Gas, Inc.	A2	A	NYSE	0.65
SJI	South Jersey Industries, Inc.	A2	BBB	NYSE	0.75
SWX	Southwest Gas Holdings, Inc.	A3	BBB+	NYSE	0.75
SR	Spire, Inc.	A1	A-	NYSE	0.65
	Average	A2	A-		0.67
	Excl. OGS, SWX and SR	A2	A-		0.66

Note: Ratings are those of utility subsidiaries

Source of Information: Utility COMPUSTAT
Moody's Investors Service
Standard & Poor's Corporation

Standard & Poor's Public Utilities
Capitalization and Financial Statistics [1]
2013-2017, Inclusive

	2017	2016	2015	2014	2013	
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 32,875.9	$ 31,133.4	$ 28,468.3	$ 27,468.3	$ 25,958.6	
Short-Term Debt	$ 1,106.5	$ 1,113.4	$ 930.9	$ 963.9	$ 764.3	
Total Capital	$ 33,982.4	$ 32,246.8	$ 29,399.2	$ 28,432.2	$ 26,722.9	
Market-Based Financial Ratios						Average
Price-Earnings Multiple	22 x	21 x	20 x	20 x	19 x	20 x
Market/Book Ratio	206.6%	191.5%	179.3%	179.1%	164.4%	184.2%
Dividend Yield	3.4%	3.6%	3.7%	3.6%	3.9%	3.6%
Dividend Payout Ratio	74.0%	75.0%	70.0%	73.2%	73.3%	73.1%
Capital Structure Ratios						
Based on Permanent Captial:						
Long-Term Debt	56.9%	56.7%	54.9%	53.3%	53.3%	55.0%
Preferred Stock	1.4%	1.8%	1.5%	1.3%	1.1%	1.4%
Common Equity [2]	41.7%	41.5%	43.6%	45.4%	45.7%	43.6%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt incl. Short Term	58.4%	58.3%	56.3%	55.0%	54.7%	56.5%
Preferred Stock	1.4%	1.8%	1.5%	1.3%	1.0%	1.4%
Common Equity [2]	40.3%	39.9%	42.2%	43.7%	44.3%	42.1%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [2]	10.4%	9.0%	9.2%	9.6%	9.0%	9.4%
Operating Ratio [3]	77.4%	78.8%	80.4%	81.2%	80.7%	79.7%
Coverage incl. AFUDC [4]						
Pre-tax: All Interest Charges	3.26 x	3.15 x	3.41 x	3.56 x	3.22 x	3.32 x
Post-tax: All Interest Charges	2.78 x	2.53 x	2.65 x	2.71 x	2.48 x	2.63 x
Overall Coverage: All Int. & Pfd. Div.	2.76 x	2.50 x	2.62 x	2.67 x	2.45 x	2.60 x
Coverage excl. AFUDC [4]						
Pre-tax: All Interest Charges	3.16 x	3.05 x	3.31 x	3.46 x	3.13 x	3.22 x
Post-tax: All Interest Charges	2.68 x	2.43 x	2.55 x	2.62 x	2.39 x	2.53 x
Overall Coverage: All Int. & Pfd. Div.	2.66 x	2.40 x	2.52 x	2.58 x	2.36 x	2.50 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	6.0%	6.4%	6.0%	7.1%	6.4%	6.4%
Effective Income Tax Rate	18.9%	28.1%	31.5%	28.6%	33.2%	28.1%
Internal Cash Generation/Construction [5]	76.4%	78.7%	70.6%	88.7%	83.2%	79.5%
Gross Cash Flow/ Avg. Total Debt [6]	19.6%	20.7%	20.0%	22.8%	22.4%	21.1%
Gross Cash Flow Interest Coverage [7]	5.47 x	5.56 x	5.39 x	5.66 x	5.46 x	5.51 x
Common Dividend Coverage [8]	4.26 x	4.37 x	4.23 x	4.80 x	4.41 x	4.41 x

See Page 2 for Notes.

Standard & Poor's Public Utilities
Capitalization and Financial Statistics
2013-2017, 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
Ameren Corporation	AEE	Baa1	BBB+	NYSE	0.60
American Electric Power	AEP	Baa1	A-	NYSE	0.60
CMS Energy	CMS	A2	BBB+	NYSE	0.55
CenterPoint Energy	CNP	A3	A-	NYSE	0.85
Consolidated Edison	ED	A3	A-	NYSE	0.45
DTE Energy Co.	DTE	A2	BBB+	NYSE	0.60
Dominion Resources	D	A2	BBB+	NYSE	0.60
Duke Energy	DUK	A1	A-	NYSE	0.55
Edison Int'l	EIX	A3	BBB+	NYSE	0.60
Entergy Corp.	ETR	Baa1	BBB+	NYSE	0.60
Exelon Corp.	EXC	A2	BBB	NYSE	0.65
Eversource	NU	A3	A+	NYSE	0.60
FirstEnergy Corp.	FE	Baa1	BBB	NYSE	0.60
NextEra Energy Inc.	NEE	A1	A-	NYSE	0.60
NiSource Inc.	NI	Baa2	BBB+	NYSE	NMF
NRG Energy Inc.	NRG	Ba3	BB	NYSE	1.25
PG&E Corp.	PCG	Baa1	BBB	NYSE	0.65
PPL Corp.	PPL	A3	A-	NYSE	0.70
Pinnacle West Capital	PNW	A2	A-	NYSE	0.60
Public Serv. Enterprise Inc.	PEG	A2	BBB+	NYSE	0.65
SCANA Corp.	SCG	Baa3	BBB-	NYSE	0.65
Sempra Energy	SRE	A2	A-	NYSE	0.75
Southern Co.	SO	Baa1	A-	NYSE	0.50
WEC Energy Group, Inc.	WEC	A2	A-	NYSE	0.55
Xcel Energy Inc	XEL	A2	A-	NYSE	0.55
Average for S&P Utilities		A3	BBB+		0.64

Note: [1] Ratings are those of utility subsidiaries

Source of Information: SNL Financial LLC
Standard & Poor's Stock Guide
Value Line Investment Survey for Windows

Peoples Natural Gas Company LLC
Capitalization and Related Capital Structure Ratios
Actual at September 30, 2018 and Estimated at September 30, 2019 and October 31, 2020

	Actual at September 30, 2018			Estimated at September 30, 2019			Estimated at October 31, 2020		
	Amount Outstanding	Ratios Excl. S-T Debt	Ratios Incl. S-T Debt	Amount Outstanding	Ratios Excl. S-T Debt	Ratios Incl. S-T Debt	Amount Outstanding	Ratios Excl. S-T Debt	Ratios Incl. S-T Debt
Long-Term Debt	$ 874,292,300	46.35%	45.68%	$ 970,017,300 [2]	47.03%	46.41%	$ 1,020,792,300 [3]	45.68%	45.12%
Common Equity									
Premium on Capital Stock	$ 828,212,419			828,212,419			828,212,419		
Retained earnings	183,940,987			264,115,987 [4]			385,840,987 [4]		
Total Common Equity	1,012,153,406	53.65%	52.88%	1,092,328,406	52.97%	52.26%	1,214,053,406	54.32%	53.66%
Total Permanent Capital	1,886,445,706	100.00%	98.56%	2,062,345,706	100.00%	98.67%	2,234,845,706	100.00%	98.78%
Working Capital Revolver [1]	27,668,165		1.44%	27,668,165		1.32%	27,668,165		1.22%
Total Capital Employed	$ 1,914,113,871		100.00%	$ 2,090,013,871		100.00%	$ 2,262,513,871		100.00%

Notes:
[1] Represents twelve-month average
[2] Represents additional borrowings of Intercompany Demand Note
[3] Reflects maturity of Tranche 3 of Promissory Note, paydown of Intercompany Demand Note, and new issue of $315 million Promissory Notes
[4] Projected increase in retained earnings — $ 80,175,000 (September 30, 2019); $ 121,725,000 (October 31, 2020)

Source of Information: Company provided data

Peoples Natural Gas Company LLC
Calculation of the Embedded Cost of Long-Term Debt
Actual atSeptember 30, 2018

Series	Principal Amount Outstanding	Percent to Total	Effective Cost Rate [(1)]	Weighted Cost Rate
2010 Intercompany Promissory Note, Tranche 3	$ 171,045,000	19.56%	5.76%	1.13%
2013 Intercompany Promissory Note, Tranche 2	144,746,400	16.56%	4.32%	0.72%
2013 Intercompany Promissory Note, Tranche 3	110,007,200	12.58%	4.44%	0.56%
2017 Intercompany Promissory Note, Tranche 1	89,455,500	10.23%	3.06%	0.31%
2017 Intercompany Promissory Note, Tranche 2	178,911,000	20.46%	3.47%	0.71%
2017 Intercompany Promissory Note, Tranche 3	178,911,000	20.46%	3.70%	0.76%
Intercompany Demand Note	1,216,200	0.14%	3.47%	0.01%
Long-Term Debt	$ 874,292,300	100.00%		4.19%
Long-Term Debt	$ 874,292,300	96.93%	4.19%	4.06%
Short-Term- Debt	27,668,165	3.07%	3.47%	0.11%
Total	$ 901,960,465	100.00%		4.16%

Notes: [(1)] As calculated on page 3 of this schedule.

Source of Information: Company provided data

Peoples Natural Gas Company LLC
Calculation of the Embedded Cost of Long-Term Debt
Estimated at September 30, 2019

Series	Principal Amount Outstanding	Percent to Total	Effective Cost Rate [1]	Weighted Cost Rate
2010 Intercompany Promissory Note, Tranche 3	$ 171,045,000	17.63%	5.76%	1.02%
2013 Intercompany Promissory Note, Tranche 2	144,746,400	14.92%	4.32%	0.65%
2013 Intercompany Promissory Note, Tranche 3	110,007,200	11.34%	4.44%	0.50%
2017 Intercompany Promissory Note, Tranche 1	89,455,500	9.22%	3.06%	0.28%
2017 Intercompany Promissory Note, Tranche 2	178,911,000	18.44%	3.47%	0.64%
2017 Intercompany Promissory Note, Tranche 3	178,911,000	18.44%	3.70%	0.68%
Intercompany Demand Note	96,941,200	9.99%	3.99% [2]	0.40%
Long-Term Debt	$ 970,017,300	100.00%		4.17%
Long-Term Debt	$ 970,017,300	97.23%	4.17%	4.05%
Short-Term- Debt	27,668,165	2.77%	3.99% [2]	0.11%
Total	$ 997,685,465	100.00%		4.16%

Notes: [1] As calculated on page 3 of this schedule.
[2] LIBOR of 2.74% forecast for the future test year plus margin of 1.25%.

Source of Information: Company provided data

Peoples Natural Gas Company LLC
Calculation of the Embedded Cost of Long-Term Debt
Estimated at October 31, 2020

Series	Principal Amount Outstanding	Percent to Total	Effective Cost Rate [(1)]	Weighted Cost Rate
2013 Intercompany Promissory Note, Tranche 2	$ 144,746,400	14.18%	4.32%	0.61%
2013 Intercompany Promissory Note, Tranche 3	110,007,200	10.78%	4.44%	0.48%
2017 Intercompany Promissory Note, Tranche 1	89,455,500	8.76%	3.06%	0.27%
2017 Intercompany Promissory Note, Tranche 2	178,911,000	17.53%	3.47%	0.61%
2017 Intercompany Promissory Note, Tranche 3	178,911,000	17.53%	3.70%	0.65%
Intercompany Demand Note	3,761,200	0.37%	4.69% [(2)]	0.02%
2020 Intercompany Promissory Note	315,000,000	30.86%	5.16%	1.59%
Long-Term Debt	$ 1,020,792,300	100.00%		4.22%
Long-Term Debt	$ 1,020,792,300	97.36%	4.22%	4.11%
Short-Term- Debt	27,668,165	2.64%	4.69% [(2)]	0.12%
Total	$ 1,048,460,465	100.00%		4.24%

Notes: [(1)] As calculated on page 3 of this schedule.
[(2)] LIBOR of 3.44% forecast for the fully forecast future test year plus margin of 1.25%.

Source of Information: Company provided data

Peoples Natural Gas Company LLC
Calculation of the Effective Cost of Long-Term Debt by Series

Series	Coupon Rate	Date of Issue	Date of Maturity	Average Term in Years [(1)]	Principal Amount Issued	Discount and Expense	Net Proceeds	Net Proceeds Ratio	Effective Cost Rate [(2)]
2010 Intercompany Promissory Note, Tranche 3	5.53%	02/26/10	02/26/20	10.0	$ 171,045,000	$ 2,984,655	$ 168,060,345	98.26%	5.76%
2013 Intercompany Promissory Note, Tranche 2	4.10%	12/19/13	12/19/23	10.0	144,746,400	2,551,031	$ 142,195,369	98.24%	4.32%
2013 Intercompany Promissory Note, Tranche 3	4.25%	12/19/13	12/19/25	12.0	110,007,200	1,938,761	$ 108,068,439	98.24%	4.44%
2017 Intercompany Promissory Note, Tranche 1	2.90%	12/18/17	12/18/22	5.0	89,455,500	672,419	$ 88,783,081	99.25%	3.06%
2017 Intercompany Promissory Note, Tranche 2	3.38%	12/18/17	12/18/27	10.0	178,911,000	1,344,298	$ 177,566,702	99.25%	3.47%
2017 Intercompany Promissory Note, Tranche 3	3.63%	12/18/17	12/18/32	15.0	178,911,000	1,344,298	$ 177,566,702	99.25%	3.70%
2020 Intercompany Promissory Note	5.10%	10/31/20	10/31/40	20.0	315,000,000	2,362,500	$ 312,637,500	99.25%	5.16%

Notes: [(1)] Determined by taking into account the effect the annual sinking fund requirements, which are met by the payment of principal that reduces the term of each issue.
[(2)] The effective cost for each issue is the yield to maturity ("ytm") using as inputs the average term of the issue, the coupon rate, and the net proceeds ratio.

Source of Information: Company provided data

Monthly Dividend Yields for
Natural Gas Group
for the Twelve Months Ending October 2018

Company	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	12-Month Average	6-Month Average	3-Month Average
Atmos Energy Corp (ATO)	2.10%	2.26%	2.35%	2.41%	2.31%	2.24%	2.18%	2.16%	2.12%	2.10%	2.07%	2.27%			
Chesapeake Utilities Corp (CPK)	1.52%	1.66%	1.77%	1.96%	1.85%	1.95%	1.86%	1.85%	1.77%	1.73%	1.77%	1.87%			
New Jersey Resources Corporation (NJR)	2.46%	2.71%	2.82%	2.88%	2.72%	2.65%	2.47%	2.44%	2.54%	2.58%	2.54%	2.60%			
NiSource Inc (NI)	2.55%	2.74%	3.19%	3.38%	3.28%	3.20%	3.09%	2.98%	2.98%	2.89%	3.15%	3.08%			
Northwest Natural Holding Company (NWN)	2.74%	3.19%	3.30%	3.63%	3.30%	3.08%	3.17%	2.98%	2.90%	2.92%	2.84%	2.93%			
ONE Gas Inc (OGS)	2.12%	2.30%	2.61%	2.89%	2.79%	2.65%	2.46%	2.47%	2.40%	2.35%	2.24%	2.34%			
South Jersey Industries Inc (SJI)	3.33%	3.59%	3.83%	4.31%	3.98%	3.64%	3.41%	3.35%	3.32%	3.40%	3.18%	3.81%			
Southwest Gas Holdings Inc (SWX)	2.31%	2.47%	2.71%	3.01%	2.94%	2.87%	2.75%	2.74%	2.68%	2.69%	2.64%	2.71%			
Spire Inc. (SR)	2.75%	3.00%	3.40%	3.34%	3.12%	3.13%	3.18%	3.19%	3.16%	3.04%	3.06%	3.11%			
Average	2.43%	2.66%	2.89%	3.09%	2.92%	2.82%	2.73%	2.68%	2.65%	2.63%	2.61%	2.75%	2.74%	2.68%	2.66%
Excl. OGS, SWX and SR	2.45%	2.69%	2.88%	3.10%	2.91%	2.79%	2.70%	2.63%	2.61%	2.60%	2.59%	2.76%	2.72%	2.65%	2.65%

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: http://performance.morningstar.com/stock/performance-return
http://www.snl.com/interactivex/dividends

					Excl. OGS, SWX and SR
Forward-looking Dividend Yield	1/2 Growth	D_0/P_0	(.5g)	D_1/P_0	
		2.68%	1.035000	2.77%	2.74%
	Discrete	D_0/P_0	Adj.	D_1/P_0	
		2.68%	1.04338	2.79%	2.77%
	Quarterly	D_0/P_0	Adj.	D_1/P_0	
		0.6688%	1.017059	2.75%	2.72%
	Average			2.77%	2.74%
	Growth rate			7.00%	7.25%
	K			9.77%	9.99%

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

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

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

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)	9.00%	6.00%	4.50%	3.00%	6.00%	5.00%	5.50%	4.00%
Chesapeake Utilities Corp (CPK)	7.50%	8.50%	5.50%	4.50%	10.00%	9.50%	7.00%	8.50%
New Jersey Resources Corporation (NJR)	5.50%	7.00%	6.50%	7.50%	8.00%	7.00%	8.00%	7.00%
NiSource Inc (NI)	-10.50%	-5.00%	-5.00%	-2.50%	-7.00%	-4.00%	-5.50%	-3.00%
Northwest Natural Holding Company (NWN)	-22.00%	-11.50%	1.50%	3.00%	1.00%	2.50%	-6.50%	-3.00%
ONE Gas Inc (OGS)	-	-	-	-	-	-	-	-
South Jersey Industries Inc (SJI)	-1.50%	2.50%	7.00%	8.50%	8.00%	7.50%	3.50%	5.50%
Southwest Gas Holdings Inc (SWX)	5.00%	6.50%	11.00%	8.00%	5.50%	5.50%	5.00%	4.50%
Spire Inc. (SR)	4.00%	4.00%	4.00%	3.50%	9.00%	7.50%	7.00%	6.00%
Average	-0.38%	2.25%	4.38%	4.44%	5.06%	5.06%	3.00%	3.69%
Excl. OGS, SWX and SR	-2.00%	1.25%	3.33%	4.00%	4.33%	4.58%	2.00%	3.17%

Source of Information: Value Line Investment Survey, August 31, 2018

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

						Value Line				
Gas Group	I/B/E/S First Call	Reuters	Zacks	Morningstar	SNL	Earnings Per Share	Dividends Per Share	Book Value Per Share	Cash Flow Per Share	Percent Retained to Common Equity
Atmos Energy Corp (ATO)	7.10%	7.10%	6.50%	7.30%	5.50%	7.50%	7.00%	5.50%	5.50%	5.50%
Chesapeake Utilities Corp (CPK)	6.00%	7.20%	6.00%	8.10%	8.50%	8.50%	9.00%	9.00%	8.00%	5.50%
New Jersey Resources Corporatior	6.65%	6.65%	7.00%	6.80%	6.00%	9.50%	4.00%	9.00%	8.50%	7.50%
NiSource Inc (NI)	5.92%	5.92%	5.50%	5.00%	5.35%	18.00%	9.00%	3.00%	6.50%	4.00%
Northwest Natural Holding Compar	4.00%	4.00%	4.30%	-	4.00%	3.05%	2.50%	1.00%	10.00%	4.50%
ONE Gas Inc (OGS)	5.50%	5.50%	5.70%	-	5.50%	10.50%	10.00%	3.00%	7.00%	5.00%
South Jersey Industries Inc (SJI)	12.70%	12.30%	12.30%	12.40%	8.20%	9.50%	4.00%	7.00%	4.00%	4.00%
Southwest Gas Holdings Inc (SWX	4.00%	4.00%	4.00%	-	5.00%	9.00%	6.50%	7.00%	7.00%	5.50%
Spire Inc. (SR)	2.80%	2.80%	4.00%	-	3.57%	7.50%	4.00%	3.50%	4.50%	4.00%
Average	6.07%	6.16%	6.14%	7.92%	5.74%	9.23%	6.22%	5.33%	6.78%	5.06%
Excl. OGS, SWX and SR	7.06%	7.20%	6.93%	7.92%	6.26%	9.34%	5.92%	5.75%	7.08%	5.17%

Source of Information :
Yahoo Finance, November 9, 2018
Reuters.com, November 9, 2018
Zacks, November 9, 2018
Morningstar, November 9, 2018
SNL, November 9, 2018
Value Line Investment Survey, August 31, 2018

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)	South Jersey Industries (NYSE:SJI)	Southwest Gas (SWX)	Spire Inc. (NYSESR)	Average
Fiscal Year		09/30/17	12/31/17	09/30/17	12/31/17	12/31/17	12/31/17	12/31/17	12/31/17	09/30/17	
Capitalization at Fair Values											
	Debt(D)	3,382,272	215,400	1,107,676	8,603,400	853,339	1,300,000	1,216,100	1,957,450	2,210,300	2,316,215
	Preferred(P)	0	0	0	0	0	0	0	0	0	0
	Equity(E)	8,895,813	1,283,856	3,549,373	8,651,196	1,714,102	3,832,415	2,484,318	3,870,321	3,602,851	4,209,360
	Total	12,278,085	1,499,256	4,657,049	17,254,596	2,567,441	5,132,415	3,700,418	5,827,771	5,813,151	6,525,576
Capital Structure Ratios											
	Debt(D)	27.55%	14.37%	23.78%	49.86%	33.24%	25.33%	32.86%	33.59%	38.02%	30.96%
	Preferred(P)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Equity(E)	72.45%	85.63%	76.22%	50.14%	66.76%	74.67%	67.14%	66.41%	61.98%	69.04%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Common Stock											
	Issued	106,104.634	16,344.442	86,555.507	337,015.806	28,736.000	52,598.005	79,549.080	48,090.470	48,263.243	
	Treasury	0.000	0.000	2,347.380	0.000	0.000	285.489	0.000	0.000	0.000	
	Outstanding	106,104.634	16,344.442	84,208.127	337,015.806	28,736.000	52,312.516	79,549.080	48,090.470	48,263.243	
	Market Price	$83.84	$78.55	$42.15	$25.67	$59.65	$73.26	$31.23	$80.48	$74.65	
Capitalization at Carrying Amounts											
	Debt(D)	3,085,000	205,200	1,097,045	7,796,500	779,887	1,200,000	1,186,800	1,823,922	2,095,000	2,141,039
	Preferred(P)	0	0	0	0	0	0	0	0	0	0
	Equity(E)	3,898,666	486,294	1,236,643	4,320,100	742,776	1,960,209	1,192,409	1,812,403	1,991,300	1,960,089
	Total	6,983,666	691,494	2,333,688	12,116,600	1,522,663	3,160,209	2,379,209	3,636,325	4,086,300	4,101,128
Capital Structure Ratios											
	Debt(D)	44.17%	29.67%	47.01%	64.35%	51.22%	37.97%	49.88%	50.16%	51.27%	47.30%
	Preferred(P)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Equity(E)	55.83%	70.33%	52.99%	35.65%	48.78%	62.03%	50.12%	49.84%	48.73%	52.70%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Betas	Value Line	0.60	0.70	0.70	0.55	0.65	0.65	0.75	0.75	0.65	0.67

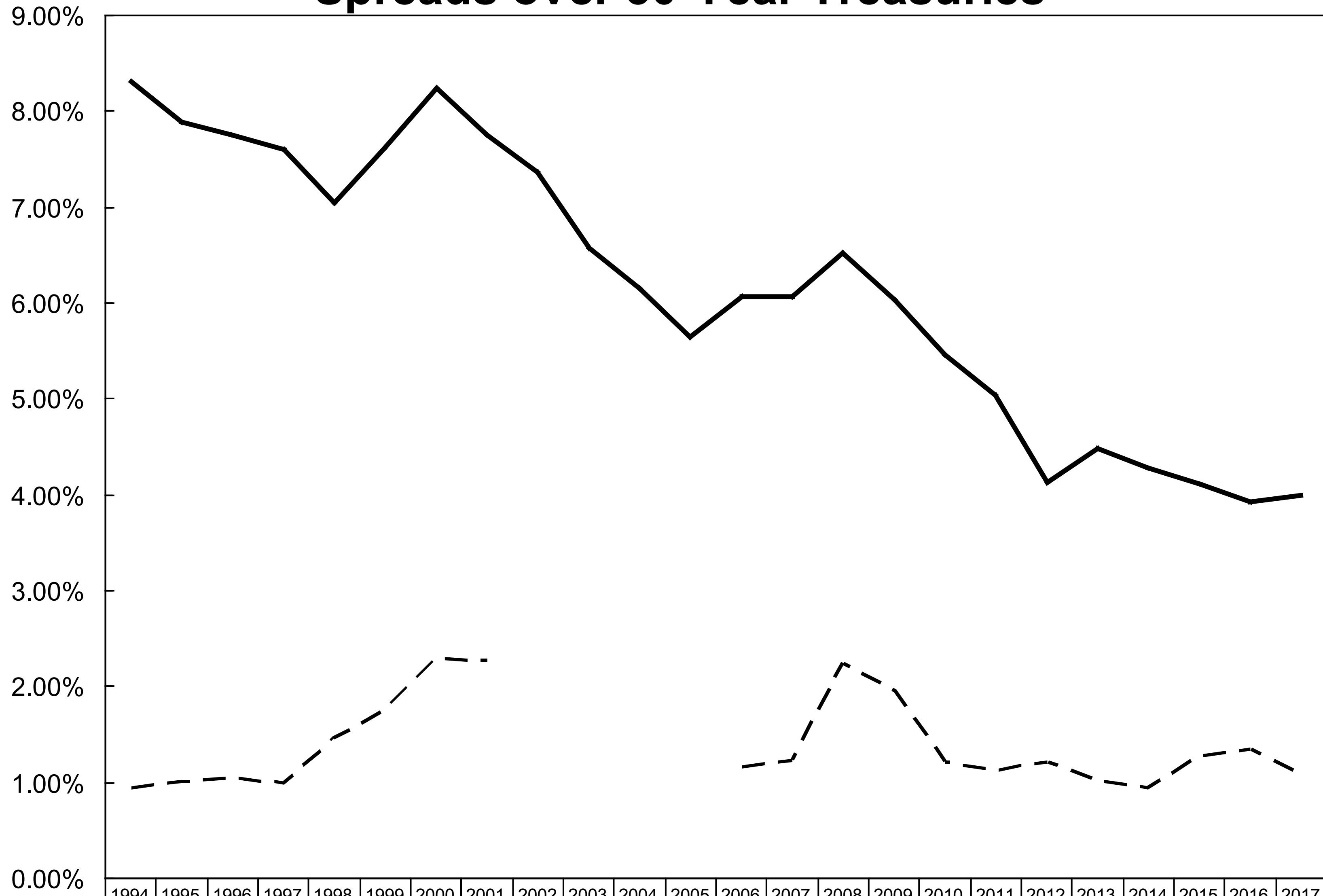
Hamada	Bl	=	Bu	[1+	(1 - t)	D/E	+	P/E	]
	0.67	=	Bu	[1+	(1-0.21)	0.4484	+	0.0000	]
	0.67	=	Bu	[1+	0.79	0.4484	+	0.0000	]
	0.67	=	Bu	1.3542					
	0.49	=	Bu						
Hamada	Bl	=	0.49	[1+	(1 - t)	D/E	+	P/E	]
	Bl	=	0.49	[1+	0.79	0.8975	+	0.0000	]
	Bl	=	0.49	1.7090					
	Bl	=	0.84						

M&M	ku	=	ke	-	(((	ku	-	i	)	1-t	)	D	/	E	-	(ku	-	d	)	P	/	E
	8.34%	=	9.77%	-	(((	8.34%	-	4.31%	)	0.79	)	30.96%	/	69.04%	-	8.34%	-	5.68%	)	0.00%	/	69.04%
	8.34%	=	9.77%	-	(((	4.03%			)	0.79	)	0.4484			-	2.66%			)	0.0000		
	8.34%	=	9.77%	-	((	3.18%					)	0.4484			-	2.66%			)	0		
	8.34%	=	9.77%	-		1.43%									-	0.00%						
M&M	ke	=	ku	+	(((	ku	-	i	)	1-t	)	D	/	E	+	(ku	-	d	)	P	/	E
	11.19%	=	8.34%	+	(((	8.34%	-	4.31%	)	0.79	)	47.30%	/	52.70%	+	8.34%	-	5.68%	)	0.00%	/	52.70%
	11.19%	=	8.34%	+	(((	4.03%			)	0.79	)	0.8975			+	2.66%			)	0.0000		
	11.19%	=	8.34%	+	((	3.18%					)	0.8975			+	2.66%			)	0		
	11.19%	=	8.34%	+		2.85%									+	0.00%						

Interest Rates for Investment Grade Public Utility Bonds
Yearly for 2013-2017
and the Twelve Months Ended October 2018

Years	Aa Rated	A Rated	Baa Rated	Average
2013	4.24%	4.48%	4.98%	4.57%
2014	4.19%	4.28%	4.80%	4.42%
2015	4.00%	4.12%	5.03%	4.38%
2016	3.73%	3.93%	4.68%	4.11%
2017	3.82%	4.00%	4.38%	4.07%
Five-Year Average	4.00%	4.16%	4.77%	4.31%
Months				
Nov-17	3.65%	3.83%	4.16%	3.88%
Dec-17	3.62%	3.79%	4.14%	3.85%
Jan-18	3.69%	3.86%	4.18%	3.91%
Feb-18	3.94%	4.09%	4.42%	4.15%
Mar-18	3.97%	4.13%	4.52%	4.21%
Apr-18	3.99%	4.17%	4.58%	4.24%
May-18	4.10%	4.28%	4.71%	4.36%
Jun-18	4.11%	4.27%	4.71%	4.37%
Jul-18	4.10%	4.27%	4.67%	4.35%
Aug-18	4.08%	4.26%	4.64%	4.33%
Sep-18	4.18%	4.32%	4.74%	4.41%
Oct-18	4.31%	4.45%	4.91%	4.56%
Twelve-Month Average	3.98%	4.14%	4.53%	4.22%
Six-Month Average	4.15%	4.31%	4.73%	4.40%
Three-Month Average	4.19%	4.34%	4.76%	4.43%

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
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%
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%	1.34%	1.10%

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%		

Year	A-rated Public Utility	30-Year Treasuries Yield	30-Year Treasuries Spread
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%		
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%

Year	A-rated Public Utility	30-Year Treasuries Yield	30-Year Treasuries Spread
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%

Year	A-rated Public Utility	30-Year Treasuries Yield	30-Year Treasuries Spread
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%
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%
Average:	12-months		1.11%
	6-months		1.19%
	3-months		1.17%

Common Equity Risk Premiums
Years 1926-2016

	Large Common Stocks	Long-Term Corp. Bonds	Equity Risk Premium	Long-Term Govt. Bonds Yields
Low Interest Rates	11.97%	4.89%	7.08%	2.96%
Average Across All Interest Rates	11.95%	6.31%	5.64%	5.07%
High Interest Rates	11.93%	7.75%	4.18%	7.22%

Source of Information: 2017 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
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%
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%
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%
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 2013-2017
and the Twelve Months Ended October 2018

Years	1-Year	2-Year	3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
2013	0.13%	0.31%	0.54%	1.17%	1.74%	2.35%	3.12%	3.45%
2014	0.12%	0.46%	0.90%	1.64%	2.14%	2.54%	3.07%	3.34%
2015	0.32%	0.69%	1.03%	1.53%	1.89%	2.14%	2.55%	2.84%
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%
Five-Year Average	0.48%	0.74%	1.01%	1.52%	1.91%	2.24%	2.72%	3.03%
Months								
Nov-17	1.56%	1.70%	1.81%	2.05%	2.23%	2.35%	2.60%	2.80%
Dec-17	1.70%	1.84%	1.96%	2.18%	2.32%	2.40%	2.60%	2.77%
Jan-18	1.80%	2.03%	2.15%	2.38%	2.51%	2.58%	2.73%	2.88%
Feb-18	1.96%	2.18%	2.36%	2.60%	2.78%	2.86%	3.02%	3.13%
Mar-18	2.06%	2.28%	2.42%	2.63%	2.77%	2.84%	2.97%	3.09%
Apr-18	2.15%	2.38%	2.52%	2.70%	2.82%	2.87%	2.96%	3.07%
May-18	2.27%	2.51%	2.66%	2.82%	2.93%	2.98%	3.05%	3.13%
Jun-18	2.33%	2.53%	2.65%	2.78%	2.87%	2.91%	2.98%	3.05%
Jul-18	2.39%	2.61%	2.70%	2.78%	2.85%	2.89%	2.94%	3.01%
Aug-18	2.45%	2.64%	2.71%	2.77%	2.84%	2.89%	2.97%	3.04%
Sep-18	2.56%	2.77%	2.84%	2.89%	2.96%	3.00%	3.08%	3.15%
Oct-18	2.65%	2.86%	2.94%	3.00%	3.09%	3.15%	3.27%	3.34%
Twelve-Month Average	2.16%	2.36%	2.48%	2.63%	2.75%	2.81%	2.93%	3.04%
Six-Month Average	2.44%	2.65%	2.75%	2.84%	2.92%	2.97%	3.05%	3.12%
Three-Month Average	2.55%	2.76%	2.83%	2.89%	2.96%	3.01%	3.11%	3.18%

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 November 1, 2018

		Treasury					Corporate	
Year	Quarter	1-Year Bill	2-Year Note	5-Year Note	10-Year Note	30-Year Bond	Aaa Bond	Baa Bond
2018	Fourth	2.7%	2.9%	3.1%	3.2%	3.3%	4.2%	5.1%
2019	First	2.8%	3.0%	3.2%	3.3%	3.5%	4.5%	5.3%
2019	Second	3.0%	3.1%	3.3%	3.4%	3.6%	4.6%	5.4%
2019	Third	3.1%	3.2%	3.3%	3.4%	3.6%	4.7%	5.5%
2019	Fourth	3.1%	3.2%	3.4%	3.4%	3.7%	4.7%	5.6%
2020	First	3.1%	3.3%	3.4%	3.5%	3.7%	4.7%	5.6%

Measures of the Market Premium

Value Line Return

As of:	Dividend Yield		Median Appreciation Potential		Median Total Return
26-Oct-18	2.2%	+	10.67%	=	12.87%

DCF Result for the S&P 500 Composite

D/P	(1+.5g)	+	g	=	k
1.88%	(1.0550)	+	11.00%	=	12.98%

where:					
	Price (P)	at	31-Oct-18	=	2726.22
	Dividend (D)	for	1st Qtr. '18	=	12.79
	Dividend (D)		annualized	=	51.16
	Growth (g)	by	First Call	=	11.00%

Summary

Value Line			12.87%
S&P 500			12.98%
Average			12.93%
Risk-free Rate of Return (Rf)			3.75%
Forecast Market Premium			9.18%
Historical Market Premium	(Rm)	(Rf)	
1926-2016 Arith. mean	11.96%	4.02%	7.94%
Average - Forecast/Historical			8.56%

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 2, 3, 4 & 5; Safety Rank of 1, 2 & 3; Financial Strength of B+, B++, A & A+;
Price Stability of 75 to 100; Betas of .55 to .75; and Technical Rank of 2, 3, 4 & 5

Company	Industry	Timeliness Rank	Safety Rank	Financial Strength	Price Stability	Beta	Technical Rank
Altria Group Inc	Tobacco	4	2	B++	95	0.65	5
Campbell Soup Co	Food Processing	4	2	B++	85	0.65	5
Capitol Federal Financial Inc	Thrift	3	2	B+	100	0.75	4
Cboe Global Markets	Brokers & Exchanges	3	2	A	80	0.70	5
Cheesecake Factory Inc	Restaurant	3	3	A	75	0.70	3
Church and Dwight Co Inc	Household Products	2	1	A+	100	0.70	3
Clorox Co	Household Products	2	2	B++	100	0.65	3
CME Group Inc	Brokers & Exchanges	2	2	A	90	0.75	4
Constellation Brands	Beverage	3	3	A	85	0.75	3
Forrester Research Inc	Information Services	3	3	B+	85	0.75	3
General Mills Inc	Food Processing	3	1	A	95	0.75	4
Hershey Company	Food Processing	3	2	B++	90	0.75	5
Hormel Foods Corporation	Food Processing	2	2	A	85	0.65	4
J and J Snack Foods Corp	Food Processing	2	1	A+	90	0.75	4
JM Smucker Company	Food Processing	3	1	A+	90	0.70	5
Kellogg Company	Food Processing	2	1	A	95	0.70	3
Republic Services Inc	Environmental	2	2	B++	100	0.75	3
Waste Management	Environmental	2	1	A	100	0.75	3
Yum Brands Inc	Restaurant	3	2	B+	100	0.75	3
Average		3	2	A	92	0.72	4
Gas Group	Average	3	2	A	88	0.67	3

Source of Information: Value Line Investment Survey for Windows, October 2018

Comparable Earnings Approach
Five -Year Average Historical Earned Returns
for Years 2013-2017 and
Projected 3-5 Year Returns

Company	2013	2014	2015	2016	2017	Average	Projected 2021-23
Altria Group Inc	NMF	NMF	NMF	41.5%	42.4%	-	53.0%
Campbell Soup Co	64.6%	49.5%	60.2%	59.9%	56.9%	58.2%	32.5%
Capitol Federal Financial Inc	4.2%	5.2%	5.5%	6.0%	6.1%	5.4%	7.5%
Cboe Global Markets	61.9%	75.9%	79.0%	58.4%	12.9%	57.6%	12.0%
Cheesecake Factory Inc	19.7%	18.3%	20.4%	23.1%	20.4%	20.4%	21.5%
Church and Dwight Co Inc	17.1%	19.7%	21.4%	23.5%	22.4%	20.8%	19.0%
Clorox Co	NMF	NMF	NMF	NMF	NMF	-	71.0%
CME Group Inc	4.6%	5.4%	6.1%	7.5%	18.1%	8.3%	8.5%
Constellation Brands	12.9%	15.5%	16.9%	20.1%	21.9%	17.5%	23.5%
Forrester Research Inc	9.7%	13.2%	16.1%	16.5%	15.8%	14.3%	17.0%
General Mills Inc	26.8%	27.9%	35.3%	36.3%	42.6%	33.8%	25.5%
Hershey Company	52.6%	61.6%	91.2%	120.7%	109.2%	87.1%	42.5%
Hormel Foods Corporation	15.9%	16.7%	17.9%	20.0%	17.2%	17.5%	18.5%
J and J Snack Foods Corp	12.5%	12.8%	11.7%	11.9%	11.6%	12.1%	12.0%
JM Smucker Company	11.7%	7.8%	10.0%	11.0%	10.1%	10.1%	10.0%
Kellogg Company	38.9%	50.1%	59.1%	69.0%	64.0%	56.2%	32.0%
Republic Services Inc	9.0%	9.0%	9.3%	9.9%	10.3%	9.5%	13.5%
Waste Management	17.7%	19.7%	21.6%	24.5%	23.7%	21.4%	25.5%
Yum Brands Inc	63.3%	90.5%	NMF	-	-	76.9%	NMF
Average						31.0%	24.7%
Average (excluding companies with values >20%)						11.8%	13.1%

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.