

Return On Equity

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1 **I. Introduction and Summary**

2 **Q. Please state your name and relationship with NW Natural Company (“NW**
3 **Natural”).**

4 A. My name is Bente Villadsen and I am a principal at The Brattle Group (Brattle). I
5 am the same Bente Villadsen who filed Direct Testimony in this matter in
6 December 2017. I have been asked by NorthWest Natural (“NW Natural” or “the
7 Company”) to review and comment on the opening testimonies of Mr. Matt
8 Muldoon on behalf of Staff (“Muldoon Testimony” or “Staff 200”), Mr. Michael P.
9 Gorman on behalf of AWEC (“Gorman Testimony” or “AWEC 100”) and Mr. Bob
10 Jenks and Mr. William Gehrke on behalf of CUB (“Jenks & Gehrke Testimony” or
11 “CUB 100”) on behalf of CUB. I have also reviewed and comment on the testimony
12 by Mr. Bradley G. Mullins on behalf of AWEC.

13 My qualifications were included with my direct testimony (“Villadsen
14 Testimony” or NW Natural 400”).

15 **Q. Please summarize your rebuttal testimony.**

16 A. Preliminarily, the ROE proposed by Staff and AWEC is well below that awarded
17 other gas LDCs recently, where the average ROE for 2017-18 was approximately
18 9.7% while the median was 9.6% in 2017 but reached 9.8% in Q1, 2018. CUB’s
19 calculates an average 9.55 percent from my multi-stage DCF. This figure is higher
20 than that of Staff and AWEC, but below the average and mean for the industry. At
21 the same time the intervening parties have provided no compelling evidence that
22 NW Natural has lower business or systematic risk than that of these companies.
23 Therefore the recommended ROE is simply too low.

24 The remainder of my rebuttal testimony reaches the following conclusions:

- 1 • My recommended ROE of 10% on 50% equity remains valid
- 2 • The ROE recommendations of interveners are too low and below industry
- 3 standards
- 4 • Interveners have not provided evidence that NW Natural has lower risk than
- 5 their peers and ignore company specific risks
- 6 • Interveners agree that interest rates are increasing; hence is the cost of capital
- 7 • Once adjusted for key flaws in inputs or method,
- 8 ○ Staff's modified results support an ROE of no less than before any
- 9 consideration of NW Natural specific risks; for the modification, I consider
- 10 the following:
 - 11 ○ Staff relies on only one method
 - 12 ○ Staff excludes Chesapeake
 - 13 ○ Staff's estimate of the market risk premium is too low
- 14 ○ AWEC's modified results support an ROE of 9.5% - 9.9% before any
- 15 consideration of NW Natural specific risks or recovery of equity issuance
- 16 costs; for the modification I consider the following:
 - 17 ○ Mr. Gorman fails to consider financial risk
 - 18 ○ Mr. Gorman relies on a growth rates that is not well described or
 - 19 documented and ignore Value Line growth rates
 - 20 ○ Mr. Gorman inappropriately uses the current yield on Baa bond in his
 - 21 risk premium model, but forecasts that government bond yield will
 - 22 increase
- 23 ○ CUB does not estimate an ROE but looks to the midpoint of the multi-stage
- 24 DCF. The midpoint of my estimate did not include equity issuance costs,
- 25 which should therefore be added.
- 26 • Regarding NW Natural's circumstances, I note that

- 1 ○ The size premium is well documented contrary to Staff's and AWEC's
2 belief although I note that I did not add a size premium to my results, but
3 merely used it as an indicator of, where in the range NW Natural would
4 fall
- 5 ○ CUB's belief that the WARM and other mechanisms reduce NW Natural's
6 risk fails to recognize that most of the sample companies have similar
7 mechanisms and ignores the empirical evidence that decoupling and
8 other mechanisms do not affect the ROE
- 9 ○ Equity issuance cost is a cost of raising capital and it is common to
10 recover such costs
- 11 • Interveners critique of my approach has no merit; specifically
- 12 ○ Contrary to Mr. Gorman's position, the consideration of financial leverage
13 through the Hamada (or other) method is fully consistent with the
14 Commission's precedence and modern finance theory
- 15 ○ Reliance on the ECAPM is warranted in addition to the CAPM and can
16 substitute for other multi-factor models. Value Line adjusted betas and
17 ECAPM consider two different impacts and are both merited.
- 18 ○ The inverse relationship between risk-free rates and allowed ROE is
19 persistent and a useful tool to determine the risk premium model
- 20 ○ My elimination of very low or very high results was (i) symmetric and (ii)
21 a simple elimination of outliers – not a biased approach.

22 **II. Recommended ROE: Industry Standards and Risk Considerations**

23 **Q. What is your reaction to the ROE recommendations from Staff, AWEC, and**
24 **CUB in this proceeding?**

25 A. As noted above, I find that my recommendation of an ROE of 10% on 50% equity
26 remains valid. In contrast, the recommendations of the intervening parties are too
27 low for several reasons. Staff's and AWEC's recommendation of 9.0% and 9.15%,
28 respectively is near the bottom of what has recently been awarded in other
29 jurisdictions – yet, no convincing evidence has been presented that NW Natural is
30 lower risk than the industry – let alone any evidence on the magnitude of such risk.
31 At the same time, the lower than standard ROE recommendations are based
32 primarily on results from the multi-stage DCF model with, in the case of Staff, no

1 consideration of other standard cost of equity estimation methods and in the case
2 of AWEC, no consideration of financial risk or recovery of equity issuance costs.
3 The recommendation of CUB is also below the national average for the gas LDC
4 industry but closer than those of Staff and AWEC. However, CUB also ignored
5 methods other than the multi-stage DCF and company-specific risks.

6 **Q. Why do you say the recommended roe is below industry standard?**

7 A. Looking to 2018 and the first quarter of 2018, the allowed ROE among US gas
8 LDC's is summarized in Figure R-1 below.

9 **Figure R-1: Allowed ROE Among US Gas LDCs¹**

	Q1, 2018	2017
Average Allowed ROE	9.68%	9.72%
Median Allowed ROE	9.80%	9.60%

10 Source: RRA Regulatory Focus: Major Rate Case Decisions – January – March 2018

11
12 Clearly, Staff's recommendation of 9.0% or AWEC's recommendation of 9.15% is
13 much below the norm while CUB's proposed 9.55% is somewhat below.²
14 Importantly, Staff's proposed ROE of 9.0% includes 12.5 basis points for equity
15 issuance costs.³ I note that the difference between the recommended ROE and
16 that typically allowed in the industry cannot be explained by NW Natural's financial
17 or business risk. The allowed ROEs for other gas LDCs were awarded on an

¹ RRA provide the publicly available ROE (ROR and Capital Structure) for all major rate cases, but does not provide details about the methodology relied upon, and limited information about specifics such as whether equity issuance costs are included in the allowed ROE. Dr. Villadsen is aware that among the 2018 allowed ROEs, the allowed ROE for Northern Illinois Gas Company (9.8%) did not include equity issuance costs, while, for example, the Missouri Public Service Commission (Spire 9.8%) and Maine Public Utilities Commission (Northern Utilities at 9.5%) did not specify whether equity issuance cost were included in the ROE.

² Staff 200 p. 1, AWEC 100 p. 2, CUB 100 p. 21.

³ Staff 200 pp. 52-53.

1 average of 51.1% equity in Q1, 2018 and 49.9% equity in 2017.⁴ This is very much
2 in line with the capital structure NW Natural is requesting in this proceeding. I also
3 see no compelling argument that NW Natural has lower business risk than the
4 peers and will address that issue next.

5 **Q. Does NW Natural face lower risk than its peers?**

6 A. No. In my direct testimony I noted that NW Natural faced risks from its smaller
7 size and from Oregon / City of Portland climate initiatives. It appears that Staff,
8 AWEC, and CUB all took issue with NW Natural's size resulting in higher risk.⁵
9 However, no party took issue with my discussion of Oregon and the City of
10 Portland's climate initiatives and their potential impact on NW Natural's risk profile.
11 In addition, CUB believes that the "purchased gas adjustment mechanism, the
12 WARM program, decoupling, environmental cost deferral, and pension cost
13 deferral" are risk reducing.⁶

14 As no party took issue with the discussion of climate initiatives, I only
15 address the impact of the recovery mechanisms on ROE and the size effect.

16 **Q. Please discuss the relationship between mechanisms such as those listed**
17 **by CUB and a utility's cost of equity.**

18 A. First and foremost, many of the mechanisms listed by CUB are common among
19 gas LDCs, so to the degree that there is any impact on the ROE, it would already
20 be included in the ROE estimates I obtain from the sample. For example, while
21 many of the sample companies operate in multiple jurisdictions, all companies in

⁴ Source: RRA Regulatory Focus: Major Rate Case Decisions – January – March 2018, April 17, 2018.

⁵ Staff 200 p. 33; AWEC pp. 53-54, and CUB 100 p. 21.

⁶ CUB 100 p. 22.

1 the subsample have some form of purchased gas adjustment mechanism and all
 2 but Chesapeake have some form of decoupling. Additionally, many of the
 3 companies have other types of trackers. Figure R-2 below illustrates the
 4 prevalence of such mechanisms and also lists the jurisdictions in which the
 5 subsample companies have substantial operations.

6 **Figure R- 2: Prevalence of Adjustment Clauses among Sample Companies⁷**

Company	Significant States	Fuel Adjustment	Decoupling	Other mechanisms
Atmos	Mississippi	Yes	Partial	1
	Louisiana	Yes	Partial	2
	Texas	Yes	Partial	3
Chesapeake	Delaware	Yes	No	4
	Florida	Yes	No	5
One Gas	Kansas	Yes	Partial	6
	Oklahoma	Yes	Partial	7
Southwest	Nevada	Yes	Full	8
	Arizona	Yes	Partial	9
Spire	Alabama	Yes	Partial	10
	Missouri	Yes	No	11
NW Natural	Oregon	Yes	Partial	12

Source: Regulatory Research Associates, "Adjustment Clauses," Aug 2016

- | | |
|--|----------------------------|
| 1. Conservation, other | 7. Conservation, other |
| 2. Other | 8. Capital tracker, other |
| 3. Capital tracker, other | 9. Conservation, other |
| 4. Environmental, other | 10. Other |
| 5. Conservation, environmental, capital tracker, other | 11. Capital tracker, other |
| 6. Conservation, capital tracker, other | 12. Environmental |

7
8

9 Based on the information in Figure R- 2 it is clear that the use of decoupling, fuel
 10 adjustment, and other mechanisms for NW Natural is in line with their use for the

⁷ NW Natural 1604 provides details about the states in which the sample companies have substantial activity.

1 sample companies. Thus, NW Natural is no less at risk for recovery than the
2 sample of regulated sample companies.

3 **Q. Are there other reasons why the recovery mechanisms that NW Natural has**
4 **in place may not impact the cost of equity?**

5 A. Yes. Empirical tests have shown that decoupling mechanisms have no impact on
6 the cost of equity. For example, Wharton and Vilbert found no evidence that
7 decoupling impacted the cost of capital for a sample of regulated electric
8 companies.⁸ A similar result was found for gas LDC in a prior study.⁹ Looking to
9 this empirical result, it is important to recognize that only items that impact
10 systematic risk affect the cost of capital. According to the empirical evidence,
11 decoupling does not affect systematic risk and hence not the cost of capital.

12 **Q. Please explain the issue with NW Natural's size.**

13 A. As explained in my direct testimony, NW Natural is smaller than the average gas
14 LDC and the average company in my sample at about half the size of the average
15 subsample company.¹⁰ According to academic studies, smaller companies
16 require a higher return than do larger companies.¹¹ For example, Duff & Phelps
17 look to all companies in the CRSP data base, which includes stocks traded on the
18 New York Stock Exchange ("NYSE") and NASDAQ and estimate the amount by
19 which a company in a specific size decile require a return on equity that is higher

⁸ Joe Wharton and Michael J. Vilbert, "Decoupling and the Cost of Capital," *The Electricity Journal* 28, 2015, pp. 19-28.

⁹ Joe Wharton, "An Empirical Study of Impact of Decoupling on Cost of Capital," National Conference of Regulatory Attorneys, June 2011.

¹⁰ NW Natural 400 p. 2 and 32 (Table 2)

¹¹ Duff & Phelps, *2017 Valuation Handbook*, Chapter 7.

1 or lower than what is determined by the CAPM. As all my sample companies (as
2 well as NW Natural) trade on the NYSE and are therefore subject to the analysis.

3 Duff & Phelps estimate the premium that is needed for a smaller size
4 company over the CAPM estimate by decile and consistently find that smaller
5 companies have a return in excess of that estimated by the CAPM, while larger
6 firms have a return below that of the CAPM.¹² Studies in the last ten years or so
7 have provided theoretical underpinnings for this result and find that theoretical
8 models have emerged in which the “size effect arises endogenously as a result of
9 systematic risk.”¹³ The results from empirical studies focus on explaining the
10 phenomena but do not directly test the theory.¹⁴ The study further notes that “the
11 size premium in the US has been positive and large in recent years” and
12 acknowledge that more research is needed.¹⁵ I know of no recent studies that
13 focus on the utility industry and of none that test the more recent theoretical
14 developments.¹⁶ I also note that while earlier studies focused on the size premium
15 using the excess return of small stocks relative to larger stocks, newer research
16 focus on the beta-adjusted size effect, which tend to be smaller.¹⁷ The figures I
17 cited in my direct testimony are beta-adjusted. Regardless, the general
18 observation on the size premium is clear – smaller stocks command a higher
19 return. However, I do not add a size premium to my estimates, but rather use the
20 literature on this topic to guide my selection of the recommended ROE. The ROE

¹² Duff & Phelps, *2017 Valuation Handbook*, p. 7-9 and 7-11.

¹³ See Marthijs A. van Dijk, “Is Size Dead? A Review of the Size Effect in Equity Returns,” *Journal of Banking and Finance* 35 (2011), pp. 3263-3274 for a review.

¹⁴ *Ibid.*, p. 3272.

¹⁵ *Ibid.*, p. 3272.

¹⁶ Studies from the 1990es found limited evidence of the size effect for utilities.

¹⁷ Michael W. Barad, “Technical Analysis of the Size Premium,” Ibbotson Associates.

1 of 10% is fully supported by my analysis as summarized in Tables 3-5 in my direct
2 testimony.¹⁸

3 **Q. What do you conclude from the discussion above?**

4 A. Indications are that gas LDC are allowed an average / median return on equity of
5 9.6 to 9.8 percent with the six 2018 decisions ranging from 9.0 to 10.19 percent.
6 Consequences of awarding a ROE below that available in other jurisdictions is a
7 matter of (i) fairness as the Supreme Court has been adamant that the allowed
8 return must be comparable to that of alternative investments of equal risk (Hope
9 and Bluefield) and (ii) investors will draw inferences about the allowed return and
10 how to allocate funds.

11 Regarding NW Natural's company risks, I note that the presence of various
12 regulatory mechanisms such as the purchased gas adjustment mechanism, the
13 WARM program (decoupling of weather usage),¹⁹ decoupling, environmental cost
14 deferral, and pension cost deferral is common among the sample companies and
15 therefore included in the cost of equity estimation. There is additionally empirical
16 evidence that decoupling does not affect the cost of capital. Therefore, tracker
17 mechanisms are neutral for the placement of NW Natural in the sample and the
18 State of Oregon and the City of Portland's climate initiatives add a degree of
19 uncertainty.

20 Lastly, NW Natural's smaller than average size provides indications that a
21 higher ROE is warranted.

¹⁸ NW Natural 400 pp. 40, 43, and 45.

¹⁹ I note that at least Atmos, Chesapeake, Southwest Gas, and Spire have some type of weather adjustment mechanism in place. Source: Regulatory Research Associates, "Adjustment Clauses," August 2016.

1 **III. Impact of Economic and Financial Developments on ROE**

2 **Q. What do intervening parties discuss regarding the economic and financial**
3 **developments?**

4 A. Mr. Muldoon discusses the economic development since NW Natural's last rate
5 case and notes that that yields on both long-term and short-term government
6 bonds has risen in 2018 (more for the shorter term securities), that dividend are up
7 and the credit negative impact of the December 2017 Tax Cut and Jobs Act
8 ("TCJA"). Mr. Muldoon concludes that optimistic growth has yet to materialize and
9 that the:

10 general economic trends underscores an economy that is still slow and
11 sluggish in growth. The slow growth of the economy in general requires
12 less of a return on equity to attract investors, indicating an ROE toward the
13 lower end of the range of reasonable ROEs.²⁰

14 Mr. Gorman concurs that interest rates have risen and are expected to
15 increase further; again more for the shorter term rates.²¹ Mr. Gorman further notes
16 that credit ratings for the gas LDC industry are mostly in the A to high BBB range
17 and stable,²² but he does not appear to discuss the impact of the TCJA.

18 **Q. Do you have any comments on the economic and financial condition**
19 **discussions by Mr. Muldoon or Mr. Gorman?**

20 A. Yes. I agree that interest rates have been and are increasing and that to date we
21 have seen the increase in interest rates primarily materialize in the shorter rates.
22 I also concur with Mr. Muldoon that the TCJA will have a negative impact on credit

²⁰ Staff 200, p. 16:13-16.

²¹ AWEC 100, pp. 16-18.

²² AWEC 100, pp. 12-13.

1 metrics and note that Moody's listed NW National as one of the companies it put
2 on watch primarily due to the tax reform.²³ I will address Mr. Muldoon's conclusion
3 that the ROE should be toward the lower end of the range of reasonable ROEs
4 below. I will also address Mr. Gorman's focus on credit rating agencies'
5 statements regarding NW Natural²⁴ as they pertain to the determination of the cost
6 of equity – credit rating agencies focus on credit risk, equity investors want a return
7 that is comparable to that of comparable equity investments.

8 **Q. What are some key developments in the economy since your direct**
9 **evidence that might impact the cost of equity?**

10 A. As noted above, increasing interest rates will impact the cost of equity as will the
11 TCJA. In addition, GDP growth was higher than expected in 2017²⁵ and market
12 volatility returned for a short period in February 2018. I discuss each of these in
13 turn along with their impact on the cost of equity.

14 **Q. How has the TCJA impacted NW Natural's cost of capital?**

15 A. While it is too early to know exactly how the TCJA will impact cost of capital, there
16 are preliminary indications. The TCJA is intended to stimulate the economy and
17 to the extent that it is successful, it will put upward pressure on inflation and interest
18 rates for an increase in the cost of capital. Additionally, a reduction in the tax rate
19 will increase the variability in NW Natural's earnings, so that earnings and cash
20 flow become more volatile as shown below in Figure R- 3.²⁶ It is clear from the

²³ Moody's, "Moody's Changes Outlook on 25 US Regulated Utilities Primarily Impacted by Tax Reform," January 19, 2018.

²⁴ AWEC 100 p. 21-22.

²⁵ NW Natural 1601.

²⁶ See also Bob S. Mudge, Mike Tolleth, and Bente Villadsen, "Six Implications of the New Tax Law for Regulated Utilities," January 2018. Available at:

1 example that a lower tax rate leads to larger volatility in earnings – in the example,
2 Net Income is reduced by \$52 if cost increases by 10%, but at 21% income tax the
3 reduction in net income increases to \$63.2. In essence, taxes act as a buffer on
4 volatility in revenues or cost.

5 **Figure R- 3: Illustration of the Impact of Lower Taxes on Net Income**

Tax Rate	Allowed Revenue		Cost Increases by 10%	
	35%	21%	35%	21%
Revenue	\$953.8	\$926.6	\$953.8	\$926.6
Cost	\$800.0	\$800.0	\$880.0	\$880.0
Income before Tax	\$153.8	\$126.6	\$73.8	\$46.6
Tax	\$53.8	\$26.6	\$25.85	\$9.78
Net Income	\$100.0	\$100.0	\$48.0	\$36.8

6
7 Further, Moody’s Investor Services on January 19, 2018 put 25 utilities on
8 credit watch negative as their credit metrics may be adversely impacted by the
9 TCJA. Among those utilities was NW Natural.²⁷ A negative ratings action clearly
10 impacts the utility’s cost of debt and could impact its access to capital.

11 While we have yet to see the impact of the TCJA on economic activity and
12 inflation as well as on credit ratings, the expected directional impact on NW
13 Natural’s cost of capital is an increase.

14 **Q. How about the development in interest rates?**

15 A. At the time I filed my direct testimony, the 20-year government bond was
16 approximately 2.7%, whereas in April it has reached 2.96% for an increase of

http://files.brattle.com/files/13011_six_implications_of_the_new_tax_law_for_regulated_utilities.pdf

²⁷ Moody’s, “Moody’s Changes Outlook on 25 US Regulated Utilities Primarily Impacted by Tax Reform,” January 19, 2018.

1 about 25 basis points.²⁸ Additionally, Blue Chip in October 2017 forecast a 10-
2 year government bond yield of 3.5% for 2020 and 2021, but that forecast had
3 increased slightly in March 2018 to 3.5% and 3.6%.²⁹ All indications are that
4 interest rates will continue to raise as the Federal Reserve increase the target for
5 the Federal Funds Rate and reduces its balance sheet. Most recently, the Federal
6 Reserve raised the Federal Funds Rate in December 2017 and March 2018, while
7 the most recent meeting in early May 2018 held the rate constant. Thus, the
8 Federal Reserve has initiated an increase in its target rate and expectations are
9 that other interest rates will follow.

10 **Q. What are your observations regarding Mr. Muldoon's and Mr. Gorman's risk-**
11 **free rates?**

12 A. Mr. Muldoon relies on an observed risk-free rate of 3.14%,³⁰ Mr. Gorman uses a
13 forecasted risk-free rate of 3.70%³¹ and my direct testimony used a forecasted
14 risk-free rate of 3.94%.³²

15 I disagree with Mr. Muldoon's use of a current risk-free rate for the purpose
16 of estimating the cost of capital for November 2018 onwards. As the rates that are
17 determined in this proceeding will become effective after November 1, 2018, it is
18 necessary to reflect the risk-free rate that is expected after November 2018.

²⁸ Federal Reserve Bank of St. Louis: <https://fred.stlouisfed.org/categories/115>

²⁹ Blue Chip Economic Indicators, October 2017; Blue Chip Economic Indicators, March 2018.

³⁰ Staff 212, p. 1. The rate is listed as that on 30-year government bonds as of Feb. 28, 2018.

³¹ AWEC 100, p. 43.

³² NW Natural 402 p. 9.

1 **Q. What are inflation expectations?**

2 A. Blue Chip forecast 2019-2020 inflation at 2.3%.³³ This is the same level as that
3 relied upon in my direct testimony, but above the 2% the Federal Reserve views
4 as “most consistent over the longer run with the Federal Reserve's statutory
5 mandate.”³⁴

6 **Q. Has market volatility changed in recent months?**

7 A. Yes. After a longer period of relatively low market volatility, the US saw substantial
8 market changes in early 2018 and the VIX (a 30-day ahead measure of market
9 volatility) spiked in February 2018. The VIX is depicted in below, which is simply
10 an updated version of Figure 4 from my direct testimony.³⁵ It is clear from the
11 figure that a period of calm on February 7, 2018 was replaced by a spike that more
12 than doubled the VIX index. While the spike in the VIX was short-lived, it showed
13 that volatility is not a thing of the past.

14 Volatility and especially longer term volatility such as the SKEW is an
15 important consideration in cost of capital estimation because, as I discussed in my
16 direct testimony, lead to higher equity risk premium and hence higher return
17 expectations.³⁶ Figure R-4 and Figure R- 5 below provide the recent history of the
18 VIX and SKEW indices.³⁷

³³ Blue Chip Economic Indicators, March 2018.

³⁴ https://www.federalreserve.gov/faqs/money_12848.htm

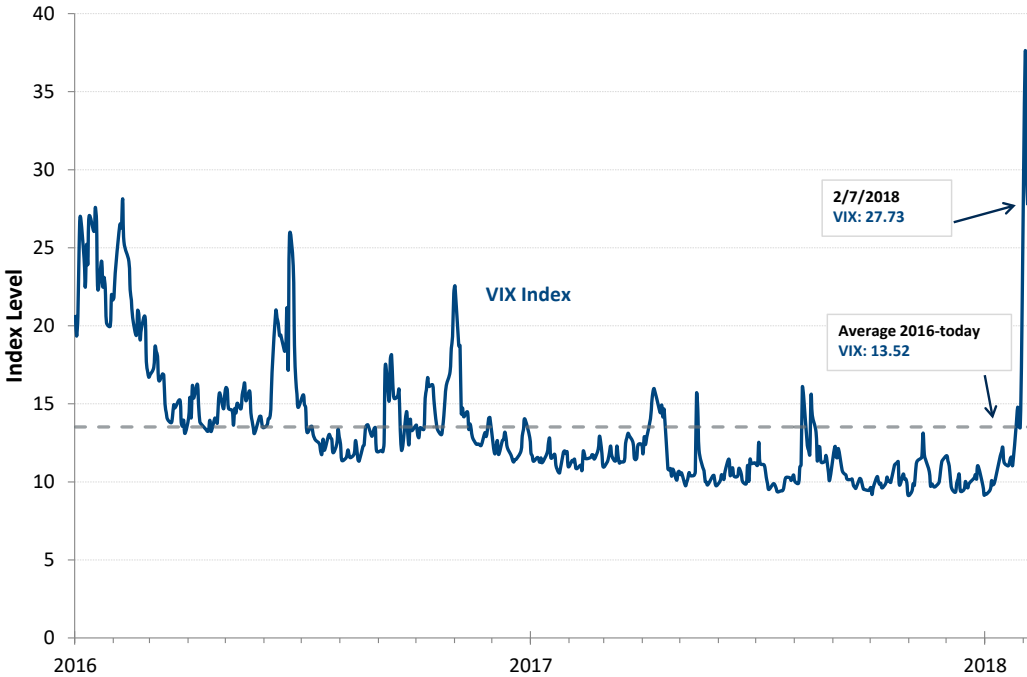
³⁵ NW Natural 400 p. 19.

³⁶ NW Natural 400 pp. 23-25

³⁷ NW Natural 1602. The associated workpaper provides the underlying data.

1

Figure R-4: Recent VIX History



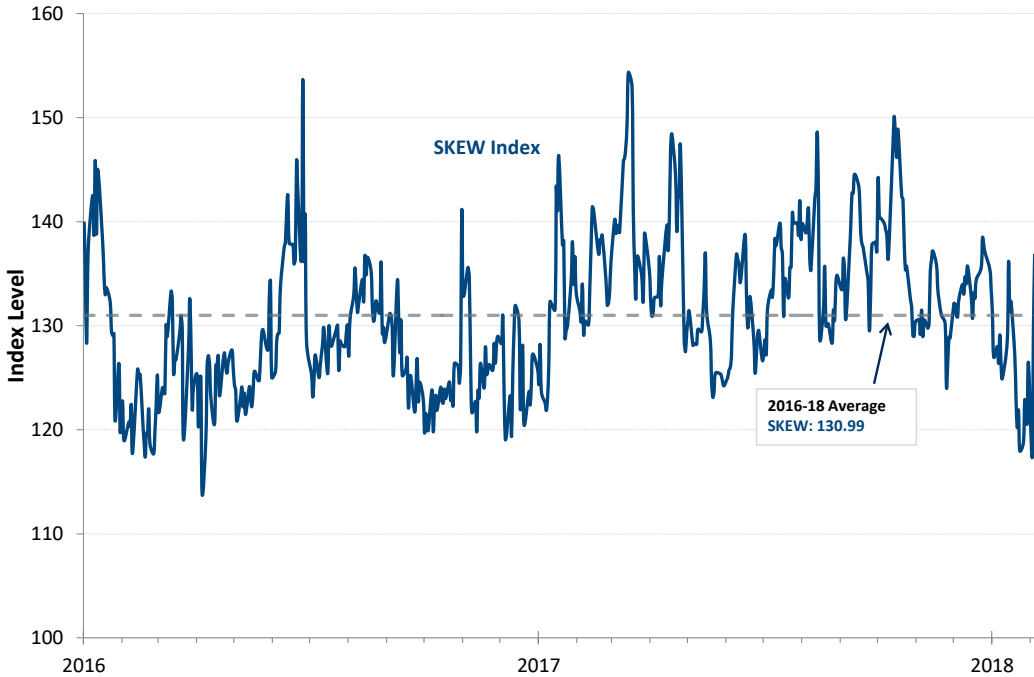
Source: Bloomberg.

2

3

4

Figure R- 5: Recent SKEW History



Source: Bloomberg.

5

1 While the VIX recently has indicated higher volatility than in the recent past, the
2 SKEW has fluctuated around its 2016-18 average, which is higher than that of the
3 past.

4 **Q. What are the implications of the developments in the general economy and**
5 **the TCJA?**

6 A. Increasing interest rates and inflation are indications that the cost of capital is
7 increasing. As interest rates have increased since my direct evidence and are
8 expected to increase further, the estimated ROE of 10% remains valid. The spikes
9 in the VIX as well as the level of the SKEW are indications that, if anything, the
10 cost of equity is increasing.

11 **IV. Recovery of Equity Issuance Costs**

12 **Q. What do interveners say about equity issuance costs?**

13 A. Staff recommends including 12.5 basis points in the allowed ROE for utilities to
14 recoup issuance / flotation costs.³⁸ AWEC's witness, Mr. Mullins, in turn suggests
15 that stock issuance costs are not an expense and therefore should not be
16 recovered in the revenue requirement.³⁹ I did not find a discussion of this issue in
17 the Jenks and Gehrke Testimony.

18 **Q. What is your reaction to these statements?**

19 A. I disagree with Mr. Mullins that equity issuance cost should be disallowed as
20 raising funds (debt or equity) cost money and, just like a discount on a bond
21 issuance, is part of what a utility needs to recover in rates. As for Staff's proposal

³⁸ Staff 200 pp. 53-54.

³⁹ AWEC 200, p. 25

1 to add 12.5 basis points to the ROE to recoup such costs, I see no problem
2 including an appropriate amount in the allowed ROE.

3 **Q. What are common practices in this regard?**

4 A. The practices vary widely by jurisdiction, but I note there are examples of
5 jurisdictions that recover such costs as a line item in the revenue requirement and
6 examples of jurisdictions that add a number of basis points to the allowed ROE.
7 As for the latter approach, I am aware that Professor Morin provides a summary
8 of methodologies relied upon to adjust the ROE for the issuance of equity.
9 Professor Morin also finds that the issuance costs vary by the size of the
10 issuance.⁴⁰ As Dr. Morin explains:

11 The simple fact of the matter is that common equity capital is not free.
12 Flotation costs associated with common stock issue are very similar to the
13 flotation costs associated with bonds and preferred stocks. Flotation costs
14 are incurred, and if they are not expensed at the time of issue, they must be
15 recovered through a rate of return adjustment. This is routinely done for
16 bond and preferred stock issues by most regulatory commission.⁴¹

17 One approach to adjusting the allowed ROE to provide recovery of all past
18 equity issuance costs can be implemented via a straightforward adjustment to the
19 single-stage DCF model. In place of the standard single-stage DCF formula, the
20 following formula is used.

21
$$r = \frac{D_1}{P_0(1-f)} + g$$

22 where f is the percentage of proceeds lost to underwriting fees or other flotation
23 costs. This formula recognizes that if shares trade at (for example) \$100, but 7.2
24 percent of the proceeds of the initial issuance of those shares was spent on

⁴⁰ Roger A. Morin, "New Regulatory Finance," 2006, Chapter 10.

⁴¹ *Ibid.* p. 321.

1 underwriting fees, only $\$100 \times (1 - 0.072) = \92.8 represents value invested in
2 cash-flow generating assets. Therefore it is relative to this “adjusted” price—not
3 the nominal market price—that investors’ required return should be measured.
4 Simply put, equity investors provided \$92.8 towards the financing of the company’s
5 assets, while \$7.2 was used to raise that capital.

6 **Q. Can you provide some concrete examples of jurisdictions that allow the**
7 **recovery of equity issuance costs or flotation costs?**

8 A. Yes. Other jurisdictions have awarded an ROE adder of 8 to 50 basis points for
9 the recovery of equity issuance costs and flotation costs. These examples are
10 summarized in Figure R-6 below.

11

1

Figure R-6: Examples of Equity Issuance Recovery

Jurisdiction	Basis Allowed	Points	Reference
Minnesota Public Service Commission		18	GR-10-276 p. 9
The Public Utilities Commission of South Dakota	Allowed, Bps not specified		Order in EL11-019 p. 6
Maryland Public Service Commission		8	Order 85724, p. 108
Federal Energy Regulatory Commission	Method for calculation		Federal Register 54, 1989: 31707-31708
Alberta Utilities Commission		50	Decision 20622-D01-2016, p. 35

2 Sources: Please see Exhibit NW Natural 1603 for a list of detailed references and
3 links.

4 **Q. In your opinion is it appropriate for nw natural to obtain cost recovery for**
5 **equity issuance costs?**

6 A. Yes. It is simply a cost of raising equity capital.

V. Input and Methodology

7 **Q. What issues do you discuss in this section?**

8 A. I discuss several technical issues pertaining to the submitted testimonies. I
9 address Staff’s sample selection, growth rate inputs, and failure to use any method
10 other than the multi-stage DCF. I also discuss Mr. Gorman’s failure to incorporate
11 a forward-looking interest rate in his risk premium model, his reliance on backward-
12 looking growth rates, and lack of considering financial risk and ECAPM.

1 **A. Sample Selection and Estimation Approach**

2 **Q. Do you have any comments on the interveners sample selection?**

3 A. Yes. Mr. Muldoon ignores Chesapeake Utilities although 82 percent of its balance
4 sheet assets and 82 percent of its property, plant and equipment are regulated,⁴²
5 which is hardly a “heavily unregulated company.”⁴³ The elimination of Chesapeake
6 is therefore not justified and reduces an already small sample.

7 Mr. Muldoon further eliminates New Jersey Resources, South Jersey
8 Industries and WGL due to their ongoing merger / acquisition activity. Mr. Gorman
9 similarly raises concern about those companies as did I in direct testimony, where
10 I created a subsample eliminating these companies. There is no large difference
11 with the inclusion / exclusion of these entities and I would normally not include
12 companies involved in merger or acquisition activity in a cost of capital analysis. I
13 therefore do not object to their exclusion.

14 **Q. What models do the witnesses present?**

15 A. While Mr. Muldoon calculates a CAPM estimated ROE as well as a single stage
16 DCF result, he relies on his multi-stage DCF results.⁴⁴ Mr. Gorman calculates
17 three DCF estimates (Constant Growth, Sustained Growth, and Multi-Stage), two
18 versions of the CAPM and two risk premium estimates.⁴⁵ CUB witnesses Jenks
19 and Gehrke do not implement cost of equity models.

⁴² Calculated as the sum of regulated assets plus regulatory assets divided by total assets and regulated assets divided by total property, plant and equipment, respectively. See NW Natural 1604.

⁴³ Staff 200 p. 42

⁴⁴ Staff 200 p. 43.

⁴⁵ AWEC 100.

1 **Q. What are your key concerns with Mr. Muldoon's and Mr. Gorman's approach**
2 **to calculate the cost of equity?**

3 A. I am concerned with Staff's reliance on a single method, because different times
4 may make any one method more or less reliable.

5 **Q. Why do you think the use of multiple methods is preferable?**

6 A. I concur with the advice of Professor Stewart C. Myers who advised to "[u]se more
7 than one model when you can." ⁴⁶ Professor Morin similarly wrote:

8 No one individual method provides the necessary level of precision for
9 determining a fair return, but each method provides useful evidence to
10 facilitate the exercise of an informed judgment. Reliance on any single
11 method or preset formula is inappropriate when dealing with investor
12 expectations because of possible measurement difficulties and vagaries in
13 individual companies' market data.⁴⁷

14 I agree as different models and the required inputs have different pros and cons,
15 it is important to consider what they can contribute to our determination of the cost
16 of capital.

17 As for the implementation of the methods, I am concerned about certain
18 inputs used in the analysis as well as with Mr. Gorman's lack of consideration of
19 financial risk. I will discuss the models in turn below.

20 **B. Comments on Staff's Estimation Methods and Inputs**

21 **Q. What concerns do you have regarding Mr. Muldoon's DCF implementation?**

22 A. I have two concerns. Mr. Muldoon relies solely on a multi-stage DCF model and
23 uses a very low equity risk premium in his Hamada calculation. He does not

⁴⁶ Stewart C. Myers, "On the Use of Modern Portfolio Theory in Public Utility Rate Cases: Comment," *Financial Management*, Autumn 1978, p. 67.

⁴⁷ Roger A. Morin, *New Regulatory Finance*, Public Utilities Reports, Inc., 2006, (Morin 2006) p. 428.

1 consider the impact of share buybacks and does not consider other versions of the
2 DCF model.

3 **Q. What are the implications of Mr. Muldoon's implementation**

4 A. Looking to Mr. Muldoon's Exhibit 207, it is clear that had Mr. Muldoon included
5 Chesapeake and considered the constant growth DCF model, one observation for
6 consideration would be an ROE of 9.44%⁴⁸ which is the average estimated by Mr.
7 Muldoon before any consideration of equity issuance costs. Adding the 12.5 basis
8 points from Mr. Muldoon's multi-stage model results in a constant growth DCF
9 result of 9.56%, which is more than 50 basis points above Mr. Muldoon's
10 recommendation.⁴⁹

11 As to Mr. Muldoon's Hamada adjustment, which is based on an
12 implementation of the CAPM and the difference obtained with and without the
13 adjustment, I note that Mr. Muldoon relies on a market risk premium of only 4.2%
14 based on Ibbotson historical MRP since 1980.⁵⁰ It appears that Mr. Muldoon relies
15 on a 2011 study by Professor Arnott for this purpose.^{51,52} There are (at least) two
16 problems with using this study for this purpose. First, the study ends in 2010 and
17 therefore captures the downturn in the market associated with the financial crisis,
18 but not the upturn that has occurred recently. Second, academic research suggest
19 that if you rely on a historical measure of the market risk premium, then it is best

⁴⁸ Staff 207, Tab "Rebuilt by Staff."

⁴⁹ Including Chesapeake in Staff's multi-stage DCF model will have limited impact on Staff's multi-stage DCF results. See NW Natural 1605 at Tab "ROE" column P.

⁵⁰ Staff 212 p. 1.

⁵¹ Staff 200 p. 43.

⁵² Robert D. Arnott, "Equity Risk Premium Myths," in *Rethinking the Equity Risk Premium* by P. Brett Hammond, Jr. Martin L. Leibowitz, and Laurence B. Siegel (eds.), CFA Institute 2011 ("Arnott 2011).

1 to rely on as long a period as is available. For example, Professors Ross,
2 Westerfield and Jaffe recommend that using as long a period as possible is
3 reasonable.⁵³

4 Lastly, Professor Arnott's article considers it a myth that the equity risk
5 premium changes little over time.⁵⁴ This is relevant because the more recent study
6 of Duarte and Rosa (2015)⁵⁵ shows that recent MRP estimates have been much
7 higher than the historical past and that a current forecast for the MRP is slightly
8 higher than the long-term historical average.⁵⁶ I recognize that by looking to
9 Bloomberg's forecasted MRP as a second measure of the MRP and Mr. Gorman
10 similarly considers a forecasted MRP. This is important because the magnitude
11 of the MRP in Staff's Hamada adjustment impacts the estimated ROE.
12 Conservatively, if I use the historical average MRP, which is lower than the
13 forecasted MRP⁵⁷ at 6.94%, in Staff's model, the estimated ROE increases by 17
14 to 25 basis points.⁵⁸

15 **Q. Do you have any additional concerns with Mr. Muldoon's inputs or**
16 **methodology?**

17 A. Yes, I have two concerns. First, "Staff declined to incorporate the hyper optimistic
18 GDP projection of the current administration."⁵⁹ Staff may find the forecast

⁵³ Stephen A. Ross, Randolph W. Westerfield, and Jeffrey Jaffe, "*Corporate Finance*," 10th Edition, 2013, p. 326

⁵⁴ Arnott (2011) p. 73.

⁵⁵ Fernando Duarte and Carlo Rosa, "The Equity Risk Premium: A Review of Models," Federal Reserve Bank of New York, December 2015. Discussed at NW Natural 400 pp. 20-21.

⁵⁶ Bloomberg as of April 30, 2018 shows a forecasted MRP of 7.34%. Mr. Gorman's forecasted MRP is 7.70% (AWEC 100 p. 49).

⁵⁷ NW Natural 405 p. 4 estimated the forecasted MRP at 7.44%. Bloomberg's current forecasted MRP is 7.34% and Mr. Gorman's forecasted MRP is 7.70% (AWEC 100 p. 49).

⁵⁸ NW Natural Exhibit 1604.

⁵⁹ Staff 200 p. 28.

1 optimistic, but the forecast is an official government forecast and merits
2 consideration. After all, the current administration can affect the growth in the
3 economy to a much larger degree than other parties Mr. Muldoon relies upon for
4 his forecast. I therefore believe it should be given some consideration. For
5 example, if Mr. Muldoon had incorporated the forecast with the same weight as
6 that of other government forecast, Mr. Muldoon's GDP forecast would increase
7 from 4.41 to 4.50 percent, which is very similar to Mr. Muldoon's estimate of using
8 the "Near Historical." As Staff's recommendation relies on this figure, there is no
9 numerical impact of Mr. Muldoon ignoring the GDP projection of the current
10 administration.

11 Second, as dividends are paid quarterly, it is preferable to estimate a
12 quarterly model rather than an annual model. Because quarterly dividends are
13 modeled to be received sooner than annual dividends, the reliance on the actual
14 dividend payment schedule will increase the estimated ROE by, in my experience,
15 approximately 10 basis points.

16 Lastly, I observe that I disagree with Mr. Muldoon's reliance on the current
17 yield on government bonds when implementing the CAPM. However, as Staff
18 does not rely on the figure, I shall not discuss the issue further.

19 **Q. What conclusions do you draw from the discussion above?**

20 A. Mr. Muldoon's exclusive reliance on the multi-stage DCF and low MRP downward
21 biases his ROE estimate. Specifically, if I correct the DCF estimates, I obtain the
22 results shown in below.⁶⁰

23 **Figure R-7: Muldoon DCF Estimates and Corrected DCF Estimates**

⁶⁰ The estimates in Figure R-6 were obtained using Mr. Muldoon's models therefore included 12.5 basis points for equity issuance costs.

	Muldoon Estimate	Corrected Estimate*
Constant Growth DCF	n/a	9.6%
Multi-stage	8.7% - 9.3%	8.9% - 9.5%
Point Estimate / Midpoint	9.0%	9.4%

* Includes Chesapeake

Looking to Figure R-7, it is clear that even small adjustments to Mr. Muldoon's inputs will increase the estimated ROE non-trivially. If I further consider the impact of modeling quarterly dividends, risk premium models or recently allowed ROE, the results increase further.

For the reasons above, I find that Mr. Muldoon's DCF model under-estimates the cost of equity for NW Natural by at least 40 basis points.⁶¹

In addition to the downward bias in the DCF model, Mr. Muldoon does not consider the CAPM or risk premium models for his recommendation. Both Mr. Gorman and I find that the estimates for the risk premium and CAPM currently are 30 basis points or more above multi-stage DCF, so any consideration of these models will add to Mr. Muldoon's estimated ROE. Therefore I find that simple modifications to Mr. Muldoon's DCF model and a consideration of the risk premium and CAPM would result in an ROE of 9.5% to 9.7%.⁶²

C. Comments on Mr. Gorman's Estimation Methods and Inputs

Q. What do you discuss in this section?

⁶¹ The simple change to his inputs show an under estimation of 40 basis points and the lack of consideration of the recent average allowed ROE of 9.6 to 9.8% further indicates an underestimation.

⁶² I use 9.5% as a lower bound in that is assigns only minimal weight to the higher estimates from the CAPM, risk premium, or quarterly dividend payments. I use 9.7% as a rounded upper bound calculated as the 9.4% from the DCF models plus 30 basis points, which is the magnitude by which the risk premium and CAPM is higher than the DCF models.

1 A. I discuss the following issues with Mr. Gorman's opening testimony. First, Mr.
2 Gorman acknowledges that recently authorized returns on equity are around 9.6%
3 - 9.7% with a range of 9.3% to 9.8%. Yet, he recommends an ROE of 9.15% for
4 NW Natural without explaining why NW Natural should be allowed a return that,
5 per his own accord, is 45 to 55 basis points below industry standards. Second, I
6 discuss Mr. Gorman's lack considering financial risk. Third, I focus on Mr.
7 Gorman's DCF models, where a key input is growth rates, where Mr. Gorman uses
8 growth rates from Reuters but not from Value Line. Fourth, I discuss Mr. Gorman's
9 implementation of the risk premium model, where he fails to use a forecasted yield
10 in one of his implementations. Lastly, I consider the CAPM and the impact of all
11 adjustments that are needed to make Mr. Gorman's estimates reasonable.

12 **1. Gorman's Recommendation**

13 **Q. What is your reaction to Mr. Gorman's recommended ROE?**

14 A. As noted above, Mr. Gorman states that recently authorized returns on equity are
15 around 9.6% - 9.7%, but recommends an ROE of 9.15% for NW Natural although
16 he also acknowledge that the "proxy group is reasonably comparable in investment
17 risk to NW Natural" and the "total financial risk profile for NW Natural ... is in line
18 with the investment risk of the proxy group."⁶³ Mr. Gorman also observes that NW
19 Natural's credit rating is comparable to the proxy group using Moody's ratings, but
20 a notch higher using S&P's rating.⁶⁴ While credit ratings are not a good measure
21 of equity owners risk because credit ratings ultimately are a measure of default risk
22 – not of the risk equity owners face year over year, I shall not discuss that issue

⁶³ AWEC 100 p. 25.

⁶⁴ *Ibid.*

1 further as Mr. Gorman does not appear to rely on this information for the ultimate
2 determination of his recommendation for NW Natural.

3 As Mr. Gorman finds NW Natural's risk characteristics in line with those of
4 comparable companies, I find it puzzling that he recommends an ROE that is well
5 below what has recently been allowed other gas LDCs. This is particularly puzzling
6 given the acknowledgement that interest rates are increasing.

7 Mr. Gorman finds two of his models to be consistent with a ROE of 9.30%
8 and one to be consistent with and ROE of 9.0% - then recommends 9.15%, which
9 weigh the recommendation towards the lower end of his estimates. However, the
10 main reason for Mr. Gorman's low recommendation is the flaws associated with
11 his implementation of the cost of equity estimation models. I discuss those next.

12 2. Failure to Recognize Financial Risk

13 **Q. What do you mean by failure to recognize financial risk?**

14 A. Financial risk is caused by the degree of leverage a company has. Staff, Mr.
15 Gorman and myself all rely on financial models to estimate the ROE based on a
16 set of comparable companies, which may have capital structures that differ from
17 that of NW Natural. As Staff explains

18 Use of the Hamada adjusted results helps ensure that Staff has captured all
19 material risk in my analysis because it captures additional risk associated
20 with varying capital structure.⁶⁵

21 Mr. Gorman simply ignores this fact and makes no attempt to consider the
22 impact of such differences.

23 **Q. What is the impact of Mr. Gorman ignoring financial risk?**

⁶⁵ Staff 200 p. 46

1 A. As the impact of financial risk can be measure using many method, the answer will
2 depend on the method relied upon. However, if Staff's methodology in its entirety
3 was used, Mr. Gorman would be under estimating the ROE by 0.26% to 0.38%.⁶⁶
4 However, if Staff's methodology was used with Mr. Gorman's choice of Market
5 Risk Premium was used; the ROE would be under estimated by 0.43% to 0.63%.⁶⁷
6 Assuming Mr. Gorman wants to be consistent, he would rely on the same sample
7 as that in his testimony, which corresponds to the higher number and also use the
8 MRP relied upon in his testimony. Therefore, his DCF estimate would increase
9 from 9.0% to 9.6% and his CAPM would increase from 9.3% to 9.9%. The risk
10 premium model's estimate would not change as it does not rely on market prices.
11 The midpoint of 9.3% and 9.9% is 9.6%, which would be the end result if Mr.
12 Gorman were simply to implement Staff's Hamada methodology using his sample
13 and his MRP.

14 **3. Financial Model Implementation⁶⁸**

15 **Q. What specific issues do you want to raise regarding Mr. Gorman's**
16 **Implementation of the DCF, CAPM, and risk premium models?**

17 A. The Gorman Testimony relies on growth rates from Zacks, SNL and Reuters. I
18 find the reliance on Reuters' growth rates problematic because little to no
19 information is available regarding their origin or the date of the estimate. In
20 contrast estimates from Value Line, SNL, IBES, or Bloomberg all provide
21 information about those that contribute to the estimate and the date of the estimate.

⁶⁶ Staff 202 p. 4

⁶⁷ NW Natural 1605.

⁶⁸ Mr. Gorman does not include equity issuance cost in the ROE, so I do not include any adjustment to the ROE for equity issuance costs in this section.

I also find it inconsistent that Mr. Gorman relies on Value Line to obtain his beta estimates – yet ignores Value Line’s growth rates.

Q. What is the impact of this choice of growth rates?

A. To test the implications of Mr. Gorman’s choice of growth rates, I replaced Mr. Gorman’s growth rates from Reuters with Mr. Muldoon’s Value Line growth estimates. This changes Mr. Gorman’s DCF estimates as follows:

Figure R-8: Gorman’s DCF Using Value Line Instead of Reuters

	Gorman As Filed	Re-Estimated Replacing Reuters with Value Line
Constant Growth DCF	8.94%	9.11%
Sustainable Growth DCF	11.38%	11.38%
Multi-Stage DCF	7.47%	7.66%
Midpoint	9.42%	9.52%
Average	9.26%	9.38%

Source: AWEC and NW Natural 1606.

Thus, a simple replacement of Mr. Gorman’s reliance on Reuters’ growth rate with the Value Line growth rates used by Staff will result in an increase in the ROE of about 10 basis points. Additionally, the DCF models merit a financial leverage consideration for which I use the 0.6% (rounded) I estimated above. Conservatively, the DCF model should therefore result in an estimate of no less than 9.9% once the Value Line growth rates and the financial leverage has been incorporated.⁶⁹

Q. How about Mr. Gorman’s Risk premium Model?

⁶⁹ This is a conservative estimate as the average / midpoint of the re-estimated DCF models is 9.38% and 9.51%, respectively. If I add the Staff Hamada adjustment with Mr. Gorman’s inputs to that the final estimate is 9.98% and 10.11%, respectively.

- 1 A. Mr. Gorman presents two versions of his risk premium model. In one, he estimates
2 the risk premium implicit in allowed ROEs over 30-year government bonds at 5.9%
3 and adds to that his forecast for the 30-year government bond yield of 3.7% to get
4 an ROE of 9.6%.⁷⁰ The more problematic of Mr. Gorman's risk premium estimates
5 is his estimate over utility bond yield, where he finds a premium of 4.7% to which
6 he adds the current yield on Baa rated utility bonds for a ROE of 9.02%.⁷¹ My
7 problem with this estimate is that once the yield on government bond increases,
8 so will the yield on Baa rated utility bonds. Mr. Gorman estimates that the
9 government bond yield will increase by approximately 63 basis points (calculated
10 as Mr. Gorman's forecast of 3.7% minus the current yield of 3.07%).⁷² Even if the
11 Baa yield only increases by a fraction of the increase in the 30-year government
12 bond yield, adding the current Baa yield to the risk premium under-estimates the
13 ROE. Assuming that the Baa yield will increase by 50 to 100 percent of Mr.
14 Gorman's expected increase in the government bond yield, an appropriate
15 estimate of the second risk premium model would be 9.3% to 9.6%. Therefore, Mr.
16 Gorman's risk premium based estimate of the ROE is downward biased and an
17 appropriate range from this simple adjustment is 9.3% to 9.6% for a midpoint of no
18 less than 9.45%.⁷³
- 19 **Q. Are there any issues with Mr. Gorman's CAPM implementation?**

⁷⁰ AWEC 100 pp. 44-46 and AWEC 116.

⁷¹ AWEC 100 pp. 45-46 and AWEC 117.

⁷² AWEC 100 p. 47 and Federal Reserve as of April 30, 2018:
<https://fred.stlouisfed.org/series/GS30>

⁷³ The fact that I do not adjust Mr. Gorman's model for the relationship between the risk-free rate and the risk premium should not be taken to mean that I agree. The results from my preferred model is included in my direct evidence.

1 A. The main problem with Mr. Gorman’s CAPM implementation is the lack of
 2 consideration of financial risk, which would add approximately 0.6% to the
 3 estimates using Staff’s methodology and Gorman’s inputs. Additionally, I find the
 4 low end of Mr. Gorman’s CAPM estimates too low, but understand he places
 5 primary reliance on the upper end and uses a point estimate of 9.3%.⁷⁴
 6 Consequently, I would re-estimate Mr. Gorman’s CAPM at 9.9% as his
 7 recommendation of 9.3% plus the 0.6% for Staff’s Hamada methodology.

8 **Q. What conclusions do you draw from the analysis and discussion above?**

9 A. Based on the analysis above, I find that Mr. Gorman under-estimates the ROE for
 10 NW Natural by no less than 35-75 basis points. This estimate is based on simple
 11 corrections to Mr. Gorman’s model regarding the lack of financial risk
 12 considerations, the use of growth rates from Reuters rather than Value Line, and
 13 using a forecasted yield on utility bonds rather than the current yield. The results
 14 from making these modifications to Mr. Gorman’s estimates are shown below in
 15 Figure R- 9.

16 **Figure R- 9: Mr. Gorman’s ROE Estimates as Modified**

	As Filed	Revised Estimate*
DCF models	9.0%	9.9%
CAPM	9.3%	9.9%
Risk Premium*	9.3%	9.5%
Recommendation / Range	9.15%	9.5% - 9.9% (Midpoint 9.7%)

17 Note that the DCF models and the CAPM include Staff Hamada
 18 methodology adjustment of 0.6% (using Gorman’s inputs), but the Risk
 19 Premium is not subject to such adjustment.

20

⁷⁴ AWEC 100 p. 51.

1 **VI. Responses to the Critique of Villadsen’s Direct Testimony**

2 **Q. Based on your review of other testimony, what do you consider a reasonable**
3 **return for NW Natural?**

4 A. Staff and AWEC critique my estimated ROE as being too high, while Staff critiques
5 my methodology and CUB states the recommended 10% has not been justified
6 appropriately.⁷⁵ However, I continue to consider a ROE of 10.0% the best point
7 estimate for NW Natural and continue to view a range of 9.7% to 10.3% as
8 reasonable. This view is confirmed by my analysis of Mr. Muldoon’s and Mr.
9 Gorman’s methods, where simple modifications to their inputs resulted in ROE
10 estimates of somewhat above 9.5% in the case of Mr. Muldoon and 9.5% - 9.9%
11 in the case of Mr. Gorman before any consideration of NW Natural’s specific risks.

12 **Q. What issues did other witnesses raise regarding your direct testimony?**

13 A. Both staff and AWEC raised issues with my ECAPM, which I therefore discuss
14 first. Additionally, Staff took issue with the inclusion of Chesapeake in my sample,
15 which I addressed in Section V.a above. Staff also objects to the reliance on
16 methods other than the multi-stage DCF and with the use of the GDP growth rate
17 from the White House administration. I addressed those issues in Sections V.b
18 and V.a, respectively and shall not repeat the discussion. Mr. Gorman for AWEC
19 further took issue with (i) my reliance on the ATWACC methodology when
20 considering financial risk in the DCF model and the Hamada / ATWACC in the
21 CAPM and (ii) my use of a regression line in the risk premium model. Finally, Mr.
22 Jenks and Mr. Gehrke on behalf of CUB took issue with my elimination of outliers
23 in the multi-stage DCF and the size premium discussion.⁷⁶ I addressed the size

⁷⁵ Staff 200 pp. 7-8, AWEC 100 p. 53, and CUB 100, p. 22.

⁷⁶ CUB 100 pp. 20-21.

1 premium above in Section II and shall not repeat the discussion, but will address
2 my choice of the range for the multi-stage DCF below.

3 **A. ECAPM**

4 **Q. What are the main criticisms of your ecapm?**

5 A. Staff is concerned that the ECAPM does not have traction in economic or finance
6 practice and note that bankers such as Morgan Stanley have moved towards multi-
7 factor models rather than towards ECAPM.⁷⁷ Mr. Gorman is concerned that the
8 reliance on adjusted betas from Value Line as well as the ECAPM double-count
9 the adjustment.⁷⁸

10 **Q. What is your response to Staff' critique?**

11 A. Mr. Muldoon is correct that bankers such as Morgan Stanley (as well as
12 academics) rely on multi-factor models along with the CAPM (or instead of the
13 CAPM). This is because multi-factor models such as the Fama-French model
14 capture phenomena that the CAPM cannot capture; including the fact that the
15 empirical security market line is flatter than the theoretical line predicted by the
16 CAPM. For example, Fama & French (2004)⁷⁹ find that the CAPM underestimates
17 returns for low-beta stocks and overestimates returns for high-beta stocks. Thus,
18 these models are capturing the same effect as is the ECAPM.

19 **Q. How do you respond to Mr. Gorman's Critique?**

20 A. Mr. Gorman attempts to conflate two separate and distinct empirical findings: (i)
21 the observed market security line is flatter than the theoretical market security line

⁷⁷ Staff 200 pp. 40-41.

⁷⁸ AWEC 100 pp. 67-70.

⁷⁹ Eugene F. Fama and Kenneth R. French, "The Capital Asset Pricing Model: Theory and Evidence," *Journal of Economic Perspectives* 18, 2014, pp. 25-46.

1 and (ii) adjusted betas are better predictors of expected betas than raw betas. The
2 ECAPM corrects for the former observation, while the Blume adjustment corrects
3 for the latter.

4 Getting the relative risk of the investment correct does not correct for the empirical
5 observation that the risk-return trade-off has a “flatter” slope than that posited by
6 the traditional CAPM, nor does adjusting that slope correct for the tendency of raw
7 historical betas to be biased predictors of the true beta that measures systematic
8 risk in forward-looking applications of either the traditional CAPM or ECAPM.
9 Simply put, the ECAPM and the Blume adjustment are not redundant. Both are
10 warranted when deriving a forward-looking estimate of the cost of equity.

11 Interestingly, recent testimony before the Alberta Utilities Commission saw an up-
12 to-date study regarding the use of ECAPM for utilities and especially their use
13 along with long-term interest rates and adjusted betas.⁸⁰ Mr. Hevert found that the
14 “CAPM tends to underestimate the returns for low-Beta coefficient firms.”

15 **B. Financial Leverage**

16 **Q. How do you respond to Mr. Gorman’s claim that you use the ATWACC and**
17 **Hamada method to increase the ROE?**

18 A. I disagree. As recognized by Staff it is important to recognize differences in
19 financial leverage – I do that using the Hamada method when possible and by
20 assuming the weighted average cost of capital is constant within a reasonable
21 range for models with no beta. Interestingly, the impact I estimate using the

⁸⁰ Rebuttal Testimony on behalf of AltaLink, EnMax, and FortisAlberta by Robert Hevert, AUC Proceeding 22570-X0890 p. 49.

1 Hamada model with tax is of the same magnitude as that of Staff's method for the
2 same choice of MRP.⁸¹

3 Financial risk or capital structure is a large topic in financial economics and it is
4 commonly recognized in finance textbooks that financial leverage impacts the cost
5 of equity for a company. A replication of the text from a standard MBA textbook is
6 provided below:⁸²

COMMON MISTAKE Is Debt Better Than Equity?

Because debt has a lower cost of capital than equity, a common mistake is to assume that a firm can reduce its overall WACC by increasing the amount of debt financing. If this strategy works, shouldn't a firm take on as much debt as possible, at least as long as the debt is not risky?

This argument ignores the fact that even if the debt is risk free and the firm will not default, adding leverage

increases the risk of the equity. Given the increase in risk, equity holders will demand a higher risk premium and, therefore, a higher expected return. The increase in the cost of equity exactly offsets the benefit of a greater reliance on the cheaper debt capital, so that the firm's overall cost of capital remains unchanged.

7
8
9 As Professors Berk and DeMarzo further note:

10 The levered equity return equals the unlevered equity return,
11 plus and extra "kick" due to leverage. ... The amount of
12 additional risk depends on the amount of leverage, measured
13 by the firm's market value debt-equity ratio, D/E....⁸³

14 Financial economics simply do not leave any doubt that the cost of equity
15 increases with financial leverage and that financial leverage is measured using
16 market value. I, like other witnesses, estimate the cost of equity using market data
17 in the CAPM-based and DCF-based models and therefore the estimation process
18 uses market data.

19 As described in my direct testimony, I consider several methods to ensure
20 that no one method unduly biases the estimation process. The most commonly

⁸¹ Compare AWEC 100 p. 65 and NW Natural 1605.

⁸² Jonathan Berk and Peter DeMarzo, "Corporate Finance," Third Edition, 2013 (Berk & DeMarzo 2013), p. 492.

⁸³ Berk & Peter DeMarzo 2013, p. 489. Similar comments appear in Richard A. Brealey, Stewart C. Myers, and Franklin Allen, 2014, *Principles of Corporate Finance*, 11th edition, McGraw-Hill Irwin (Brealey, Myers & Allen 2014), p. 433.

1 used method in textbooks is the Hamada method, which is also used by Staff. It
2 converts the equity beta that is estimated for each proxy company into the beta
3 that would be relevant if the proxy company hypothetically had the same equity
4 percentage as NW Natural. As an alternative and for the DCF method, I also
5 calculate the After-Tax Weighted Average Cost of Capital as a weighted average
6 of the cost of equity and the cost of debt and attempt to ensure that customers pay
7 the same for capital regardless of capital structure.

8 Mr. Gorman's suggestion that "[a]pplying the Hamada methodology is just
9 another way of increasing the CAPM results"⁸⁴ is simply wrong. Not only does his
10 suggestion contradict Staff's testimony but it also is at odds with every MBA
11 textbook I know of.

12 **C. Inverse Relationship between Risk-Free Rate and Risk Premium**

13 **Q. What concern does Mr. Gorman have with your risk premium model?**

14 A. Mr. Gorman believes that a regression of the allowed ROEs on the risk-free rate is
15 too simplistic and may change over time.⁸⁵

16 **Q. How do you respond?**

17 A. While I concur that the relationship between risk-free rates and the allowed return
18 may change over time, the critique is misguided. First, Mr. Gorman's proposal on
19 how to fix the issue is to assume the risk premium can be estimated as a weighted
20 average of the highest and lowest 5-year rolling average risk premium. This is
21 another simplistic estimation method that contrary to my method fails to take the

⁸⁴ AWEC 100 p. 67.

⁸⁵ AWEC 100 p. 62.

1 majority of the observations we have into account. Second, the inverse
2 relationship between risk-free rates and the allowed ROEs (or earned ROEs) was
3 not just observed in the 1980es,⁸⁶ but continues to show a statistically significant
4 result and has varied remarkable little over time. To illustrate this point, I reran my
5 risk premium analysis using data from 2000 only. The results are reported below.⁸⁷

6 Regression Line: Data from 1990 – Q3, 2017 (NW Natural 400)

7 $y = -0.5566x + 8.4776$ $R^2 = .83$ ROE = 10.2% - 10.3%

8 Regression Line: Data from 2000 – Q3, 2017

9 $y = -0.5978x + 8.6224$ $R = .77$ ROE = 10.2% - 10.3%

10 For these reasons, I believe the estimation is reasonable.

11 **D. Choice of Reasonable Ranges**

12 **Q. What issues were raised regarding your elimination of outliers?**

13 A. CUB witnesses Jenks and Gehrke stated that I subjectively made adjustments to
14 the range associated with the multi-stage DCF model,⁸⁸ while Mr. Gorman notes
15 that I eliminate some high-end estimates.⁸⁹

16 **Q. How do you respond?**

17 A. As noted in my direct testimony p. 2, estimates from all other models indicate a
18 higher ROE than does the lowest result from the multi-stage DCF. The range of
19 estimates also indicated a lower ROE than the highest CAPM estimates. To avoid

⁸⁶ AWEC 100 p. 62.

⁸⁷ See NW Natural 1606 for data.

⁸⁸ CUB 100, p. 21.

⁸⁹ AWEC 100 p. 55.

1 unduly upward or downward biasing my results I eliminated the two highest and
2 the lowest estimate – they were in a statistical sense outliers in the group of
3 estimates. In my professional judgment the lowest (below 9.4) or highest (above
4 11%) estimates I obtained were not representative for the cost of equity for NW
5 Natural.⁹⁰

6 **E. Conclusions Regarding the Critique of Your Direct Testimony**

7 **Q. Have the critiques of your direct testimony changed your estimate of the**
8 **ROE for NW Natural?**

9 A. No. I continue to believe that an ROE of 10% is reasonable and find the critiques
10 to be without merit. I provided my conclusions in the introduction and shall not
11 repeat them here.

12 **Q. Does the fact that you do not address each and every critique of your direct**
13 **testimony imply that you agree with other statements or analyses?**

14 A. No.

15 **Q. Does this conclude your testimony?**

16 A. Yes.

17

⁹⁰ If I alternatively had included both downside and upside outliers, my range would have been substantially wider, but the ultimate recommendation would not change.

List of Exhibits

<u>NW Natural Exhibit</u>	<u>Description</u>
1601	Economic development: GDP
1602	Financial markets: VIX and SKEW
1603	List of Equity Issuance Recovery Decisions Cited
1604	Gas LDC sample companies operations by jurisdiction
1605	Modifications to Staff's Model
1606	Modifications to Gorman's Models