BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

IN THE MATTER OF THE APPLICATION OF QUESTAR GAS COMPANY FOR APPROVAL OF AN INCREASE IN RATES AND CHARGES	DPU EXHIBIT 6.0SR DOCKET NUMBER 02-057-02

PREFILED SURREBUTTAL TESTIMONY OF

WILLIAM A. POWELL

DIVISION OF PUBLIC UTILITIES

October 11, 2002

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INTRODUCTION

1 **Q: Please sate your name and business address.**

2 A: My name is Artie Powell. My business address is 160 E. 300 S., Salt Lake City, Utah, 84114.

3 **Q: By whom are you employed and what is your official title?**

4 A: I am employed by the State of Utah, Department of Commerce, in the Division of Public Utilities. My
5 official title is *Utility Economist*.

6 **Q: Did you file direct testimony in these proceedings?**

7 A: Yes, I filed direct testimony on behalf of the Division of Public Utilities ("Division").

SCOPE OF SURREBUTTAL TESTIMONY

8 **Q: Are you still testifying on behalf of the Division?**

9 A: Yes, I am.

10 **Q: What is the purpose of your surrebuttal testimony?**

11 A: I am responding to the rebuttal testimony of Company witness Dr. Williamson.

SUMMARY OF SURREBUTTAL TESTIMONY

12 **Q: In his rebuttal testimony, Dr. Williamson explains several criticisms of your analysis detailed in**
13 **prefiled testimony. Is there any merit to any of these criticisms?**

14 A: No, his comments are without merit

15 **Q: Do you have any general comments concerning the analysis that you performed in this**
16 **proceeding?**

17 A: I stand by the analysis and recommendation that I made on behalf of the Division in my prefiled direct
18 testimony. My analysis is consistent with both the underlying theory of the discounted cash flow
19 (DCF) model and with statistical theory. Furthermore, a reduction in the authorized rate of return

1   from the current level of 11.0% to the recommended 10.5% is reasonable and justified by own

2   analysis, as well as Dr. Williamson's analysis (when correctly interpreted), and the analysis of the

3   Committee's witness, Mr. Parcell.

RESPONSE TO DR. WILLIAMSON'S REBUTTAL TESTIMONY

WILLIAMSON'S UPDATED RESULTS

4   **Q: In his rebuttal testimony, Dr. Williamson updates his recommendation from 12.6% to 12.5%.**

5   **Do you agree with Dr. Williamson's calculations and the resulting recommendation?**

6   A: As far as I can tell, the calculations are correct. However, as I explained in direct testimony, his final

7   recommendation, 12.5%, is not consistent with either his arguments or the results from his model runs.

8   **Q: Would you explain the inconsistencies and the impact these have on Dr. Williamson's final**

9   **recommendation?**

10   A: Briefly, these are the same inconsistencies found in his direct testimony:

11   ▪ Dr Williamson ignores the results from the DCF model with dividend growth estimates;

12   ▪ Despite his argument that Value Line forecasts are less reliable, Dr. Williamson gives equal
13   weight to IBES and Value Line earnings in his final recommendation; and

14   ▪ Dr. Williamson uses the median estimate from each model run instead of the mean, which is
15   the more appropriate statistic.

16   Making the appropriate adjustments – including the dividend results, weighting IBES and Value

17   Line earning results, and using the sample mean – Dr. Williamson's recommendation would be

18   approximately 10.3%, which is only twenty basis points lower than my recommendation.

19   I arrived at the 10.3% figure by first weighting Dr. Williamson's DCF results (i.e., IBES and

20   Value Line earnings) by the number of IBES analysts reported by Dr. Williamson in his rebuttal

21   testimony. The mean and median weighted values are shown in Table 1. Averaging the *means* for the

22   weighted earnings, along with Dr. Williamson's retained earnings and dividend results yields the

23   10.3%

Table 1: Dr Williamson's Updated Figures

	DCF w/IBES Earnings	DCF w/VL Earnings	Retained Earnings	DCF w/VL Dividends	Weighted Earnings VL & IBES
Mean	11.53%	12.69%	11.67%	7.43%	11.76%
Median	11.82%	13.96%	11.62%	6.15%	12.21%

Simple Averages:	Retained & Weighted Earnings	Retained & Weighted Earnings And DCF w/Dividends
Means	11.72%	10.29%
Medians	11.92%	10.00%

1   If, as Dr. Williamson insists, we were to use the median results, Dr. Williamson's

2 recommendation would be even lower, namely, 10.0%, which is the recommendation of the

3 Committee of Consumer Services.

4   Therefore, given my original analysis, and the corrected figures for Dr. Williamson's updated

5 results, an authorized return of 10.5% appears just and reasonable.

DIVIDENDS AND EARNINGS GROWTH RATES

6 **Q: Let's explore these issues one at a time, starting with dividends. Dr. Williamson does not use**

7 **dividends to arrive at a final recommendation. Do you agree with Dr. Williamson's exclusion of**

8 **dividends?**

9 A: No, I do not. I have included the DCF model with dividend growth in my final recommendation.

10 **Q: Would you explain why?**

11 A: The discussion to use both dividends and earnings growth rates or to rely strictly on earnings, is an

12   issue with a history (at least) as far back as 1989. In that year, in docket 89-057-15, Dr. Williamson,

13   who appeared as witness for Mt. Fuel, argued that earnings growth should be used exclusively as the

14   growth input in the DCF model. Witnesses for the Committee and the Division argued that both

15   earnings and dividends should be used. (While some of the witnesses have changed, the parties are at

16   least consistent in their respective positions). In this docket, the Commission concluded,

1   We can only accept Dr. Williamson's DCF results in part. The critique offered
2   by the division and the Committee witnesses is persuasive . . . reliance upon
3   earnings growth rate forecasts to estimate the dividend growth rate . . . imparts
4   an upward bias.

5   This issue surfaced once again in Docket 93-057-01, wherein, the Commission stated, "Growth

6   rate estimation is the point of greatest dispute." This is certainly true in the present case. However,

7   the Commission went on to say, "We need not resolve, however, the witnesses' debate about the use

8   of earnings versus dividend forecasts. As a forecast, each approach is an exercise of informed

9   judgment about an uncertain future." This is also true in the present case: the future is still uncertain;

10   both dividend and earnings growth estimates are likely to be inaccurate. Which is more accurate is

11   not the issue; the issue is finding a growth rate estimate that is reasonable. The Commission went on

12   to conclude,

13   The use of both earnings and dividend forecasts to bound the problem of
14   estimating the required growth rate is the most reasonable approach.

15   I concur with the Commission on this point: combining both growth estimates, as I have done,

16   yields a reasonable estimate of the growth rate to use in the DCF model.[1]

17   The Commission reiterated their position in subsequent dockets:

18   The upshot is that we remain convinced that we should use as much relevant
19   information as is available, and that means both earnings and dividend
20   information. The record shows that using only the earnings growth forecasts . .
21   . produces the highest DCF estimates for the return requirements of proxy
22   companies. . . . We also find reasonable [the] argument that several sources of
23   information should be used to estimate the growth variable, "g". . . . that stock
24   price is most affected by the discounted value of dividends received in the early
25   years; the higher the dividend yield the more important the early years. This is
26   ignored by relying on earnings growth. (Docket 95-049-05)

27   The DCF model, using reasonable growth rate estimates . . . yields useful
28   results. (Docket 97-035-01)

29   Finally, in the last Questar rate case, Docket 99-057-20, the Commission states,

30   We are generally persuaded that the earnings growth rate is the upper limit for
31   dividend growth rate, and that short-run dividend growth is volatile and perhaps
32   unsustainable. We therefore look to other measures. On this record, an average
33   of dividend and earnings growth rates is appropriate.

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[1] Strictly speaking, I did not combine the growth rates. I combined the results from two separate model runs: the DCF w/dividends and the DCF w/earnings.

1   **Q: It does appear that the Commission has been very clear on this issue in the past. Do you believe**
2   **there is any reason for the Commission to alter their position?**

3   A: No, there has been no evidence submitted by any party in this case to dispute the Commission's logic
4   on this issue. Quit the contrary, the Committee's witness, Mr. Parcel, offered evidence that analysts'
5   forecasts likely overestimate earnings growth. This only strengthens the use of both dividend and
6   earnings growth in the DCF model.

7   Therefore, it is reasonable to use both earnings and dividends growth estimates to bound, as I
8   have done in this case and previous cases, the range of reasonable growth rates. Note, in Docket 93-
9   057-01, the Commission concludes,

10   Given the evidence in this docket, the use of both earnings and dividend
11   forecasts to *bound* the problem of estimating the required growth rate is the
12   most reasonable approach and we will accept it. (Emphasis added).

13   Clearly, Dr. Williamson's insistence on using earnings growth exclusively, as the proxy for the
14   growth rate (g) in the DCF model, is contrary to the Commission's stated position.

Once more unto the breach, dear friends, once more[2]

THE MEAN VERSUS THE MEDIAN

15 **Q: To arrive at his final (updated) recommendation, Dr. Williamson averages the median**
16   **estimates. Do you agree with this approach?**

17 A: No, I do not agree with Dr. Williamson's use of the median. As I explained in my direct testimony,
18   the mean is the appropriate statistic in this case.

19 **Q: Would briefly explain your reasoning one more time?**

20 A: Generally speaking, the sample mean is a better estimator than the median of the central tendency or
21   typical value of a distribution. In particular, if the sample is drawn from a population that has a
22   symmetric bell-shaped distribution, the sample mean will have a smaller sampling error than will the
23   sample median. If the population is not symmetric, then it may be the case that the sample median is
24   the better estimator.

25   Unfortunately, we do not know what the population distribution of returns looks like; it may be
26   symmetric and bell-shaped or it may not. And, therefore, it is difficult to know, *a priori*, which

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[2] William Shakespeare, *Henry V*, Act III, Scene 1.

1   statistic to use to summarize the information contained in the sample. Therefore, we must rely on the

2   characteristics of the sample itself. The general practice, as it is explained in almost every elementary

3   statistics text is, as I explain in my direct testimony: if the sample contains outliers, the median will be

4   a better indicator of the central tendency or typical value; if the sample does not contain any outliers,

5   the mean is the better estimator. I demonstrated this in direct testimony for a small sample of returns.

6   (See DPU Exhibits 6.10-6.12)

7   In the present case, the samples (i.e., the results from each individual model run) do <u>not</u> contain

8   any outliers. Therefore, Dr. Williamson should use the mean result from each model run, not the

9   median, to summarize that models results. As I illustrated above, if he had done so, the Company's

10   updated recommendation would be very similar to my own recommendation and the recommendation

11   of the Committee. By switching focus from the median to the mean, and including the results from

12   the dividend model, moves Dr. Williamson's recommendation from 12.5% to 10.9%. (See Table 1)

13   **Q: How do you know if a sample contains outliers?**

14   A: There are several methods available to detect outliers. Probably the most common, and certainly one

15   of the simplest, methods is the box-plot.

16   In DPU Exhibit 6.12 attached to my direct testimony, I explain the basic calculations in

17   constructing a box-plot. Using the sample a lower and upper fence is calculated. These fences are

18   then used to determine if the sample contains outliers. Values in the sample greater than the upper

19   fence and values below the lower fence are considered to be unusual and constitute outliers.

20   This is the only method I have used in proceedings before this Commission.

21   **Q: In his rebuttal testimony Dr. Williamson asserts that in Docket 99-057-20 you used a different**

22   **"test" to detect outliers. Is Dr. Williamson correct in this assertion?**

23   A: No, Dr. Williamson is mistaken. As I state above, and as I stated in my testimony in the prior docket,

24   I use the box-plot criteria to detect outliers.

25   The portion of my testimony that Dr. Williamson is referring to is not a "test" for outliers – it was

26   an example to illustrate the relative effects that outliers have on the mean and the median. One of the

27   reasons the median is a better estimator in the presence of outliers, is that its value is less sensitive to

28   those outliers than the mean. The example in my prior testimony simply illustrates this point.

29   In his rebuttal testimony, Dr. Williamson asserts that I some how employ the relative magnitude

30   of this impact to detect outliers. As I stated, this is simply a mistake on his part. Though it may have

31   been unclear in my prior testimony, a moment's reflection will confirm this. In that example, to show

32   the impact that outliers have, I replaced the outliers in a sample with the average of the original

33   sample. How did I know which values to replace? I knew, because, as I explained in the previous

1   case, I used the box-plot criteria.   Why would I need to construct a "test"[3] to detect outliers, when I
2   already knew which values were the outliers?

3   The methodology I use, and have used in the past, to detect and classify sample values as outliers
4   is the standard box-plot criteria.

5   **Q: In rebuttal testimony, Dr. Williamson asserts that your choice of the mean in this case is**
6   **inconsistent with your choice of the median in Docket 99-057-20. How would you respond to this**
7   **assertion?**

8   A: As I discussed above, there are no outliers in the samples in the prior rate case. Thus, the sample
9   mean is the better estimator. In the prior rate case, there were several outliers in the sample. Thus, in
10   that case, the median was the better estimator. Therefore, my use of the median in the prior case and
11   the mean in this case is well supported by statistical theory. (Dr. Williamson's choice of the median in
12   this case is contrary to statistical theory).

13   In the prior rate case, the Commission understood and agreed with the logic of my position. In
14   their final order to that docket, the Commission states,

15   In past cases, the Commission has opted to eliminate outliers. We continue to
16   believe an adjustment for outliers is appropriate. . . . For this reason, *we give*
17   *more weight to Division's use of the median* and Committee's use of a larger
18   group than to the Company's insistence on the group mean. (Emphasis added)

19   Similar logic should lead the Commission to adopt the mean in this case.

HOW SHOULD ONE COMBINE RESULTS

20   **Q: In several places Dr. Williamson implies or states that you combined results in a way to obtain**
21   **the lowest recommendation possible. For example, at one point Dr. Williamson states that,**
22   **"[Artie] did it by setting up an adroit series of averaging." Do you agree with this**
23   **characterization of your methodology?**

24   A: Quit the contrary, I believe my approach is reasonable and defensible.

25   **Q: Would you explain how and why you combined the results they way you have?**

26   A: Certainly. However, instead of repeating what I have already stated in direct testimony, let's start
27   with the end results and work backwards.

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[3] As a side comment, the so called "test" that Dr. Williamson construes in rebuttal testimony to detect outliers is not a valid methodology.

1   As I indicated above, there are three sets of final results I use to come to a final recommendation.
2   These results come from the DCF model and the TVM. There are two sets of results from the DCF
3   model. One using dividend growth rates and the other uses earnings growth rates. The average
4   results are summarized in Table 2.

Table 2: Divisions Original ROE Estimates

Model	Mean Result
DCF w/Dividends	7.21%
DCF w/Earnings	12.11%
TVM	12.31%
Average	10.54%

5   The average of these results is 10.54%, which is the basis of my recommendation of 10.5%.

6   **Q: Dr. Williamson claims that by combining the results in this fashion, you are giving equal weight**
7   **to the dividends. Do you agree with this assessment?**

8   A: No. His assessment is based on a fundamentally flawed premise. Dr. Williamson assumes that the
9   model results are independent or separate from one another.

10   Two of the models, however, use the same information to arrive at an estimate of the ROE.
11   Therefore, the DCF model with earnings and the TVM are not separate estimates but are two ways of
12   using the same information, in this case earnings growth, to estimate ROE.

13   Arguably, a more appropriate way to combine the results would be to first, find the average of all
14   the earnings based models and dividends based models separately. And then combine these latter
15   results into a single estimate. In the present case we would average the DCF w/earnings result with
16   the TVM to get 12.21% and then average this result with the DCF w/dividends result, 7.21%, to get a
17   recommendation of 9.7%. This approach would be giving dividends and earnings equal weight in the
18   final recommendation. By taking the simple average of the three sets of results, I am actually giving
19   twice as much weight to earnings as I am to dividends: one-third to dividends and two-thirds to
20   earnings.

1 **Q: In reference to your three estimates, Dr. Williamson states, "Rather obviously the 7.21% is an**
2   **'outlier,' and by his own testimony he should have used the 12.11% median of the three**
3   **numbers in his recommendation." How would you respond to Dr. Williamson's assertion?**

4 A: This is simply a claim of Dr. Williamson, which reveals his preference to discard dividends entirely,
5   and is not based on any real evidence. On the contrary, using simple box-plot criteria,[4] it is easily
6   shown that the 7.21% is not an outlier. For the three estimates – 7.21%, 12.11%, and 12.31% – we
7   obtain the following results

$$\text{The First Quartile:} \quad Q_1 = 9.66\%$$

$$\text{The Second Quartile:} \quad Q_2 = 12.11\%$$

$$\text{The Third Quartile:} \quad Q_3 = 12.21\%$$

$$\text{The Inner Quartile Range:} \quad IQR = Q_3 - Q_1 = 2.55\%$$

$$\text{The Lower Fence:} \quad LF = Q_1 - 1.5 * IQR = 9.66 - 1.5 * (2.55) = 5.84\%$$

$$\text{The Upper Fence:} \quad UF = Q_3 + 1.5 * IQR = 12.21 + 1.5 * (2.55) = 16.04\%$$

8   According to standard box-plot procedures, the fences define the boundaries for outliers or
9   extreme values: values above the upper-fence or below the lower-fence are consider outliers. Since
10   the 7.21% is within the lower-fence, it is not an outlier. Likewise, the largest value is within the upper
11   fence. Thus, there are no outliers in this limited sample or set of estimates. The average of the three
12   estimates, which is the basis of my recommendation, is consistent with my direct testimony.

13 **Q: Dr. Williamson list results from five different model runs in his rebuttal testimony and indicates**
14   **that these results are from your own exhibits. Are these results accurate?**

15 A: Yes, these results, which I reproduce in the table below, are from my direct testimony.

Table 3: Original Estimation Results

Model	DPU Exhibit	Mean	Median
DCF w/Dividends	6.4	7.21%	6.09%
DCF w/VL Earnings	6.5	12.72%	13.84%

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[4] See DPU Exhibit 6.12.

DCF w/Zacks Earnings	6.6	12.04%	12.38%
TVM w/VL Current P/E	6.8	11.87%	11.07%
TVM w/VL Forecasted P/E	6.9	12.74%	13.16%

1　　　　Each model's result represents the summary of the individual results for the nine firms in our set

2　　of comparable utilities. For example, 7.21% is the mean estimate for the nine firms using the DCF

3　　model with dividend growth.

4　**Q: In regards to these estimates, Dr. Williamson claims, "the results from Dr. Powell's DCF**

5　**analyses, when properly analyzed . . . lead to the conclusion that the cost of equity capital for**

6　**Questar Gas Company is above 12.0%." Would you agree with this assessment?**

7　A: No, I would not. Dr. Williamson's claim is based on two erroneous premises. First, as was discussed

8　　previously, Dr. Williamson assumes incorrectly that all of the models represent separate

9　　methodologies. Second, Dr. Williamson ignores the model using dividend growth rates and relies

10　exclusively on the results from the models utilizing earnings. Additionally, by separating all the

11　models as he does in rebuttal, Dr. Williamson's position is inconsistent.

12　**Q: Would you please explain why you believe there is some inconsistency in Dr. Williamson's**

13　**position?**

14　A: Both in his direct and rebuttal testimony, it appears that Dr. Williamson's position is that, because they

15　are based on only one analysts' opinion, Value Line forecasts are not as reliable as other forecasts

16　from, say Zacks or IBES, which are based on more than one analysts' work.

17　　　However, when Dr. Williamson combines his results to come to a recommendation he ignores

18　this argument and simply takes the average of the median estimates for all models, which includes

19　results for Value Line's and IBES's earnings separately.

20　　　Such an approach conjures up images of the unreasonable requests my sons occasionally put

21　forth. On these occasions I usually respond, "Go eat your cake." Meaning, you can't have your cake

22　and eat it too. Either Value Line is or is not as reliable as other financial services. But you can't

23　claim that they are less reliable, because someone else wants to use their forecasts, and then treat them

24　as if they were just as reliable, because those estimates are higher and suit your position, as Dr.

25　Williamson has done.

26　**Q: You did not use Value Line and Zacks earnings separately in arriving at your recommendation.**

27　**Instead you used a weighted forecast from these two sources. Would please explain why?**

28　A: I agree in general with Dr. Williamson's argument that, because Value Line is based on one analyst's

29　work it is likely to be less reliable than other estimates such as Zacks. However, Value Line's

1   information is readily available and is widely used. By weighting the information from these two

2   sources we discount but do not ignore Value Line's forecasts. Dr. Williams weighted Value Line and

3   IBES equally; I give unequal weighting to Value Line and Zacks.

4   The weighting scheme I use is simple and reasonable. For a particular utility, if Value Line's

5   forecast is given by E_v, and there are n analysts from Zacks with an average forecast E_z, then the

6   weighted earnings forecast that I use in the DCF model is given by,

$$E_w = \frac{1}{n+1}E_v + \frac{n}{n+1}E_z$$

7 **Q: In your direct testimony you have only one estimate from the TVM while Dr. Williamson lists**

8 **two in his rebuttal testimony. Would you explain the difference?**

9 A: I actually list both TVM results in the exhibits attached to my direct testimony. However, for reasons

10   similar to those discussed in weighting the earnings forecasts, I average the TVM results to obtain a

11   single estimate, the 12.31% referred to previously.

12   In my direct testimony there are two runs of the TVM. The first run uses the current price

13   earnings ratio (P/E) report by Value Line, the second run uses Value Line's forecasted P/E. The

14   future price, the price at which the stock is assumed to be sold in the future, is given by EPS*P/E,

15   where the EPS is the forecasted earnings per share given by Value Line.

16   As Dr. Williamson points out in his rebuttal testimony, the use of the current P/E assumes that

17   this ratio will continue unchanged over the period of estimation. Using the forecasted P/E implicitly

18   assumes that the first assumption is not correct. Which of these assumptions is more accurate is a

19   matter of debate. I attempted to mitigate the controversy by averaging the results from the two

20   separate runs.

21   Thus, when we correctly weight the earnings forecasts and average the TVM results, there are not

22   five separate estimates but only three as I have illustrated previously, namely,

23   ▪   DCF w/ Dividend Growth   7.21%

24   ▪   DCF w/ Weighted Earnings   12.11%

25   ▪   TVM (Average Results)   12.31%

26   The average of these results is 10.54%, which, once again, is the basis of my recommendation of

27   10.5%.

28 **Q: Though your methodology is very reasonable, I am still somewhat bothered by one aspect of Dr.**

29 **Williamson's claims with regards to the way you have combined your results. In his rebuttal to**

1   **your testimony, Dr. Williamson seems to be implying that, one should add results based on**

2   **earnings until the results based on dividends are insignificant. Do you agree with my**

3   **assessment, and, if you do, how would you respond to Dr. Williamson's implied claim?**

4   A: Yes, I agree with your assessment. And, frankly, the implied claim or methodology that Dr.

5   Williamson appears to be suggesting is not logical. Let me see if I can explain.

6   Suppose we start with two models whose results are given by M_1 and M_2. Let's further assume

7   that the first model uses dividends and the second model uses earnings. If we average the results from

8   these two models, then we would be giving equal weight (1/2) to both dividends and earnings.

9   Namely,

10

$$\frac{M_1 + M_2}{2} = \frac{1}{2}M_1 + \frac{1}{2}M_2$$

11   Now I realize this is not like watching professional wrestling, but bear with me. Suppose we add

12   one more result from a model based on earnings say, M_3. Then the weighting obviously changes; we

13   would be giving 1/3 to dividends and 2/3 to earnings:

14

$$\frac{M_1 + M_2 + M_3}{3} = \frac{1}{3}M_1 + \frac{1}{3}M_2 + \frac{1}{3}M_3$$

15   Which, if we assume that the earnings models' results are similar to one another, can be rewritten as,

16

$$\frac{1}{3}M_1 + \frac{2}{3}(M_2 + M_3)$$

17   If we stopped here, we would essentially have my approach: I give 1/3 weight to dividends and

18   2/3 weight to earnings. This is, I believe, justified because only Value Line reports dividend growth

19   forecasts. However, what Dr. Williamson seems to imply is that we should continue to add earnings

20   models, *ad infinitum,* or at least until the weight on dividends is negligible. This approach, which I

21   believe is wrong, is a direct reflection of Dr. Williamson's preference to discard dividends entirely.

CAPITAL ASSET PRICING MODEL

22   **Q: Dr. Williamson makes several comments regarding your use of the CAPM. Do you have any**

23   **response?**

24   A: Yes. I believe that Dr. Williamson misunderstands how I have employed the CAPM and, therefore,

25   misrepresents in rebuttal testimony my position.

1   It is my understanding that the Commission has, in the past, placed little or no emphasis on the

2   results from CAPM. Therefore, I do not use the results from the CAPM in formulating my final

3   recommendation; I use the results from the CAPM for my own peace of mind   If the results were

4   substantially different from the DCF results, then I would attempt to find out why and (depending on

5   the reasons) possibly recommend some modification of the DCF results.

6   **Q: What do you mean by substantially different?**

7   A: The CAPM requires estimates for three inputs: (1) the betas, (2) a risk free rate of return, and (3) the

8   market premium.

9   The betas and risk-free rate I use are from Value Line. The betas come from the Value Line

10   survey sheets for each of the companies in the comparable set of utilities. The risk-free rate comes

11   from Value Line and is the rate for a government bond. The market premium is the average premium

12   from a historical study conducted by John Cochrane. The Cochrane study also provides a 95%

13   confidence interval (CI) for the market premium. The average premium from Cochrane's study is 8%

14   while the 95% CI ranges from 3% to 13%.

15   Using the endpoints of the CI, the risk free rate, and the Value Line betas, we get a range of

16   estimates for the ROE of 7.3% to 13.63%. (See DPU Exhibit 6.14). If my recommendation from the

17   DCF model were outside of this range, then I would be concerned and would, as explained above,

18   attempt to find out why. On the contrary, however, in the present case my recommendation is in the

19   middle of this range.

20 **Q: In rebuttal testimony, Dr. Williamson provides betas and associated statistics taken from**

21   **Ibbotson. If you were to use these alternative estimates of beta, how would your CAPM results**

22   **change?**

23 A: If you look at Dr. Williamson's exhibit QGC 3.15R, you will see that the Ibbotson betas are

24   substantially less than the Value Line betas. Therefore, the range of ROE estimates for the CAPM

25   would be much smaller than stated above. As a result, it is likely that my recommendation of 10.5%

26   would be above the indicated range.

27 **Q: Doesn't this suggest that your recommendation is too high?**

28 A: On the surface it appears that way. However, before concluding that my recommendation is too high,

29   as Dr. Williamson implies, we would want to understand more about the beats from both Value Line

30   and Ibbotson.

31   For example, as Dr. Williamson points out, the beta coefficients from Ibbotson are statistically

32   insignificant. That is, from a statistical point of view, the values are not significantly different from

33   zero. In order to understand why this is so, one would have to start with the raw data and verify the

34   estimates and procedures used to obtain the betas. We would also want to understand why there is

1   such a large difference between Ibbotson and Value Line's betas. Based on the findings, an

2   adjustment to my original recommendation may or may not be warranted.

3   However, I have not attempted to verify the Ibbotson or Value Line numbers and, therefore, I am

4   not suggesting an adjustment to my recommendation based on the CAPM results.

TERMINAL VALUE MODEL

5   **Q: In his rebuttal testimony, Dr. Williamson states, "The TVM methodology is not widely used."**

6   **Do you agree with this statement?**

7   A: It's not clear to me what Dr. Williamson means by this comment. In his book, "Regulatory Finance:

8   Utilities' Cost of Capital," Dr. Morin outlines the use of this model, under the section titled "The Non-

9   constant Growth DCF Model."[5]

10   In addition, as was explained in a data response to Questar, this model has been used in previous

11   rate cases before the Utah Public Service Commission: Dockets 99-035-10, 99-057-20, and 01-035-

12   01. Indeed, in the first rate case listed here, the witness for PacifiCorp referred to the model as a non-

13   constant growth DCF model. The name I believe however was misleading, because the growth rates

14   were employed as if they were constant. Thus, I changed the name to the more descriptive Terminal

15   Value Model.

16   **Q: Dr. Williamson argues that you should have used quarterly dividends in the TVM and that, if**

17   **you had, the estimates would be somewhat higher. Do you agree with Dr. Williamson, that**

18   **quarterly as opposed to annual dividends should be used with the TVM?**

19   A: No, I do not. I note that parties have argued in the past before the Utah Commission that, quarterly

20   dividends should be used in the standard DCF model. In that case (Docket 93-057-01), the

21   Commission concluded that,

> We reject the argument that because dividends are paid quarterly, the impact of
> quarterly compounding must be considered.

22   The Commission's conclusion was based in part on a finding that the quarterly dividend version

23   of the DCF model overstated the required return. In a subsequent docket, 95-049-05, the

24   Commissions states,

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[5] Rodger A Morin, Regulatory Finance: "The Cost of Utilities' Capital," Public Utilities Reports, Inc., 1994, pp. 118-124.

We reaffirm a decision reached in a previous docket that the quarterly form
overestimates required return.

Given that the TVM is essentially a DCF model and, therefore, would likely overstate the
required return, I do not believe that adjusting the model to use quarterly dividends is appropriate.

1 **Q: Dr. Williamson also points out that, according to the way you have accounted for dividends, the**
2 **investor essentially gets no benefit from buying the stock for the first year. That is, they do not**
3 **receive a dividend until the stock has been held for a year. Do you agree with this evaluation?**

4 A: Yes, I do. This may be a shortcoming of the way I have employed the model. However, if you
5 compare the results from the DCF model using earnings growth rates with the results from the TVM,
6 you will see that they are of similar magnitude, implying that the TVM results are primarily driven by
7 earnings growth rates. Thus, including an adjustment for the partial first year is likely to have little
8 effect on the outcome.

CAPITAL STRUCTURE

9 **Q: In direct testimony, you supported a capital structure that did not include short-term debt. Is**
10 **that correct?**

11 A: Yes, that is correct. In direct testimony I supported a capital structure consisting of 47.39% long-term
12 debt and 52.61% equity. This capital structure is, according to Mr. Gary Robinson, the long-term debt
13 and equity positions of Questar Gas as of December 31, 2001.

14 **Q: The Committee's witness, Mr. Parcel, recommends a modification to include short-term debt in**
15 **the capital structure. Are you familiar with Mr. Parcell's argument?**

16 A: Yes, as far as it is articulated in his prefiled direct testimony.

17 **Q: Have you reviewed the rebuttal testimony of Mr. David Curtis, in particular, his response to Mr.**
18 **Parcell's recommendation?**

19 A: Yes, I have.

20 **Q: Have you drawn any conclusions from the testimony of these witnesses?**

21 A: No, I haven't. The ratemaking principle underlying capital structure is, as Mr. Curtis points out in
22 rebuttal, to determine a mix of capital that will support the utilities rate-base. Since rate-base consists
23 of long-term assets, the Division has maintained the position that long-term debt and equity are the
24 appropriate supporting instruments. Although Mr. Parcell raises some intriguing issues, I do not

1   believe that Mr. Parcell's evidence is sufficient, at this time, for the Division to depart from their long-
2   standing practice of supporting a capital structure that excludes short-term debt.

3   **Q: Do you believe that Mr. Curtis has conclusively shown that Questar does not use short-term debt**
4   **to support rate-base?**

5   A: No, not conclusively. The evidence that Mr. Curtis present in rebuttal, while supportive of the
6   Company's position, is to limited in its scope to be conclusive.

7   **Q: Does that conclude your surrebuttal testimony?**

8   A: Yes it does.