## I. INTRODUCTION.

**Q. Please state your name and address.**

A. My name is Thomas M. Zepp. My business address is Suite 250, 1500 Liberty Street, S.E., Salem, Oregon 97302.

**Q. What is your profession and background?**

A. I am an economist and Vice President of Utility Resources, Inc., a consulting firm. I received my Ph.D. in Economics from the University of Florida. Prior to jointly establishing URI in 1985, I was a consultant at Zinder Companies from 1982-1985 and a senior economist on the staff of the Oregon Public Utility Commissioner between 1976-1982. Prior to 1976, I taught business and economics courses at three different colleges and universities for several years.

I have been deposed or testified on various topics before regulatory commissions, courts and legislative committees in 18 states, before two Canadian regulatory authorities and before four Federal agencies.

**Q. Have you been involved in regulatory proceedings in Washington in the past?**

A. Yes. I have represented many different clients, including NW Natural ("company"), on a variety of issues before this Commission. In addition to cost of capital studies, I have prepared estimates of incremental costs of energy and telecommunications services.

**Q. Have you testified on financial issues in other proceedings and forums?**

A. Yes. I have submitted studies or testified on financial issues before the Washington State Hospital Commission, Interstate Commerce Commission, Bonneville Power Administration, and courts or regulatory agencies in Arizona, California, Idaho, Illinois, Kentucky, Nevada, Oregon, Tennessee, Utah, Washington and Wyoming.

My studies and testimony have included consideration of the financial health and fair rates of return for Nevada Bell Telephone, Illinois Bell Telephone, General Telephone of the Northwest, Pacific Northwest Bell, Pacific Power & Light, Portland General Electric, Commonwealth Edison, Northern Illinois Gas, Iowa-Illinois Gas and Electric, Puget Sound Power & Light, Idaho Power, Cascade Natural Gas, Mountain Fuel Supply, Northwest Natural Gas, California-American Water Company, Dominguez Water Company, Kentucky-American Water Company, Oregon Water Company, Paradise Valley Water Company, Park Water Company, San Gabriel Valley Water Company, Southern California Water Company, Tennessee-American Water Company and Valencia Water Company. I have also prepared estimates of the appropriate rate of return for not-for-profit hospitals and for-profit hospitals in Washington and the fair rates of return for a large insurance company, and U.S. railroads.

**Q. Do you have any other professional experience related to cost of capital issues?**

A. Yes. I presented a paper "Application of the Capital Asset Pricing Model in the Regulatory Setting" at the 47th Annual Southern Economic Association Meetings, published an article "On the Use of the CAPM in Public Utility Rate Cases: Comment," Financial Management, Autumn 1978, pp. 52-56, published an article "Water Utilities and Risk," Water the Magazine of the National Association of Water Companies, Vol. 40, No. 1, Winter 1999, and was an invited speaker on the topic of the risk of water utilities at the 57th Annual Western Conference of Public Utility Commissioners in June 1998. In 1980, I was invited to lecture at Stanford University to discuss my research on the conceptual basis for methods of equity cost determination for utilities and had

some of that research acknowledged in the June 1985 Journal of Financial and Quantitative Analysis (page 127).

**Q. What is the subject of your testimony in this proceeding?**

A. NW Natural has asked me to discuss the Discounted Cash Flow ("DCF") model and to estimate the company's cost of equity with the version of the DCF model that I believe is most appropriate to consider.

**Q. How is your testimony organized?**

A. In Section II, I present an overview of the fair rate of return on equity and summarize my testimony. In Section III, I present a range of estimates of NW Natural's market cost of equity (sometimes called "bare-bones" cost of equity) using a multi-stage-growth DCF model and data for a sample of gas local distribution companies ("LDCs"). I expect NW Natural's cost of equity to fall within that range at this time. I also compute a range of equity cost estimates derived from company-specific data for NW Natural and find a similar result. In Section IV, I present a discussion of flotation costs, estimate a reasonable value to add to the bare-bones cost of equity to recover flotation costs and present my estimates of the fair rate of return for NW Natural. In Section V, I put my estimates in perspective by comparing them to recent decisions in other jurisdictions.

**Q. Have you prepared any tables to accompany your testimony?**

A. Yes. I have prepared six tables which are part of this testimony. I also sponsor an article from the Public Utilities Fortnightly which provides a survey of recent ROEs authorized by commissions in 1997 and 1998.

/////

/////

/////

## II. OVERVIEW AND SUMMARY OF TESTIMONY.

**Q. PLEASE DISCUSS WHAT IS MEANT BY A FAIR RATE OF RETURN.**

A. A fair rate of return is achieved when a utility is permitted to set rates and charges for service at levels where the expected return provides common stock investors a reasonable opportunity to earn the cost of common equity. This return is generally acknowledged to be no less than the company's cost of capital. It is a weighted average of the cost of common equity and the costs of more senior securities.

Since operating expenses and interest on debt take precedence over payments to common stock holders, it is the common equity shareholder of the company who bears the greatest risk of receiving expected earnings. The courts recognized this many years ago and cast much of the tests and burden of regulatory performance in terms of the end result the common equity shareholder could expect. In 1923, the U.S. Supreme Court set forth the following standards in the Bluefield Waterworks decision:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility, and should be adequate, under efficient and economic management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties. A rate of return may be reasonable at one time and become too high or too low by changes affecting opportunities for investment, the money market, and business conditions generally. 262 U.S. 679, 692-93 (1923).

In the Hope Natural Gas Company decision, issued in 1944, the Court stated the following regarding the return on common equity:

> [T]he return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital. 320 U.S. 591, 603.

In 1989, the Supreme Court reaffirmed the principles adopted in the Hope decision in Duquesne Light Co. v. Barasch but also recognized that the cost of common stock was ". . . the return required to sell such stock upon reasonable terms in the market." 488 U.S. at 310, n 7. Thus, the test of a fair rate of return is tied to the issue of new shares of common stock. The Court found that the authorized return should be high enough to provide investors that buy new shares of common equity a reasonable opportunity to earn the cost of equity. In general, that finding implies that flotation costs incurred by firms with publicly-traded shares of common stock are part of the fair rate of return on common stock equity. I estimate such a flotation cost adder below in Section IV of my testimony.

**Q. Does a company's cost of debt provide any information about its cost of equity?**

A. Yes. For both legal and economic reasons, a company's cost of equity will exceed the cost of debt. A firm's long-term bonds offer investors priority claims to assets and income of the firm when compared to common stocks. Also, even though, for example, 20-year bonds may fluctuate in value from year to year during the 20-year period held by the investor, unless the company goes bankrupt, the firm will redeem those bonds at par at the end of the 20-year

period. There is no such assurance that common stock holders will ever be able to sell the shares they purchase at the price they originally pay for them.

Available evidence for gas LDCs shows that in the 1980's and 1990's, as interest rates increase (decrease), the risk premium above debt is expected to decrease (increase). The cost of equity, however, has been above the cost of debt throughout the period. More generally, unless the economy is expected to be in an extremely inflationary period and thus there is considerable uncertainty about future interest rates, that cost of equity will be above a company's cost of debt. The cost of equity should be even higher above the cost of U. S. Treasury securities which are less risky than corporate bonds.

**Q. Are there any industry-specific considerations which the Commission should take into account when it determines the models used to estimate a fair rate of return for NW Natural?**

A. Yes. Investors are aware of at least two developments in the utility industry which should be considered when determining the models which are most reliable in determining the cost of equity faced by typical utilities. First, dividends have been cut or not increased by a number of firms in the industry and may be cut by others. This reduces substantially the usefulness of the constant growth discounted cash flow ("DCF") model to determine equity costs for this industry at this time. Investors should expect that as dividend increases are delayed, future retention ratios will increase and thus future growth rates will exceed growth rates achieved in the past and forecasted to occur in the immediate future. With such expectations, a multi-stage growth DCF model allows examination of more realistic scenarios about what investors expect future growth to be over the long haul. It is such long-term growth that leads investors to pay the prices they now pay for firms – not past growth.

Second, investors are aware that there have been and can be expected to be mergers. This has given investors added reason to focus on the future longer-term prospects of the various utilities instead of past growth or expected near-term growth. As is discussed further below, a potential attractive price for a stock several years into the future is equivalent in a multi-stage DCF model with a different future terminal growth rate. I address this further below.

**Q. Please summarize your findings and recommendations.**

A. My findings are as follows:

(1) Based on my multi-stage growth DCF analysis of a sample of 12 gas LDCs, I conclude the market ("bare-bones") cost of equity facing a typical gas LDC falls in a range of 10.9% to 11.6% at this time. NW Natural's market cost of equity is expected to fall in that range.

(2) A range of DCF equity cost estimates based on company-specific information for NW Natural is 10.6% to 11.8% and overlaps the 10.9% to 11.6% range I adopt.

(3) Flotation costs should be recognized and added to the bare-bones cost of equity to determine the fair rate of return on common equity. I determine that flotation costs are no less than 25 basis points at this time and thus the fair rate of return for NW Natural is a range of 11.2% to 11.9%.

(4) The Public Utilities Fortnightly article attached to my testimony reports a range of litigated equity cost determinations of 10.7% to 12.5% (if the highest and lowest decisions are disregarded) during 1997 and 1998. My estimated range of the fair rate of return falls well within this range of previously litigated decisions by various commissions.

(5) I recommend the Washington Commission authorize NW Natural an equity return of no less than 11.25%.

## III. DCF EQUITY COST ESTIMATES.

**Q. As a preliminary matter, what sample of companies have you adopted to determine the cost of equity for gas LDCs?**

A. I have adopted a sample of 12 gas LDCs which are followed by Value Line and which have the majority of their revenues derived from gas operations. I derive this sample from the sample of 17 gas LDCs which the Oregon PUC Staff and I adopted as a gas distribution company sample in a 1999 case, but have removed the five companies which have either merged with another company or are in the process of being acquired. The companies in my sample are shown in Table 1.

**Q. Why have you used the DCF model to make estimates of the cost of equity?**

A. There are solid theoretical and conceptual bases supporting the use of DCF models to estimate equity costs for companies, such as utilities, which have relatively large dividend yields. It is difficult to apply the DCF model or have confidence in the equity costs produced with the DCF model in situations where the company being analyzed pays no dividends or very small dividends because such a large portion of the equity cost depends upon the analyst's determination of growth. But when -- as is the case with utilities -- dividend yields make up a relatively large portion of the equity cost and there are data to provide a reasonable basis to determine future growth prospects, the DCF model provides a solid basis to determine equity costs.

**Q. What is the basic DCF model?**

A. The basic, constant growth DCF model is as follows:

(1) Equity cost = $D_1/P_0 + g$,

where $D_1 = D_0 \times (1 + g)$, $D_0$ is the current dividend, $D_1/P_0$ is next period's dividend divided by the current price ($P_0$) and g is long-term sustainable growth in

dividends per share ("DPS"). Since the "g" is growth that investors expect can be sustained for a long time in the future, the growth in earnings per share ("EPS") that permit dividend growth is a crucial consideration. Equation (1) is derived by assuming a constant growth in DPS (and EPS) in equation (2) and solving for the equity cost ("k") which will discount the stream of future dividends back to a present value equal to the current stock price ("$P_0$"):

(2) $$P_0 = D_1/(1+k) + D_2/(1+k)^2 + \ldots + D_n/(1+k)^n,$$

where the $D_i$ and $(1 + k)^i$ are values for the various future $i^{th}$ periods that extend all the way out to infinity (represented by $n^{th}$ period).

**Q. What version of the DCF model have you primarily used to make your equity cost estimates?**

A. I have primarily used a multi-period model which recognizes three different growth rates in the equation below:

(3) $$P_0 = D_1/(1+k) + D_2/(1+k)^2 + D_3/(1+k)^3 + (D_4 + P_4)/(1+k)^4$$

where

(4) $$P_4 = D_5/(k - g^T)$$

and

(5) $$D_5 = D_4 \times (1 + g^T).$$

**Q. Does "$P_4$" in Equation 3 have particular significance at this time?**

A. Yes, it does. In a period in which investors are well aware that the utility stock they buy today may be purchased at a premium by some other company in just a few years, "$P_4$" is the equivalent of the expected takeover price. If such a takeover is anticipated, the investor substitutes the takeover price for long-term growth ($g^T$) that he/she would otherwise expect if the utility were not taken over. If indeed a premium price is expected, it implies the equivalent of a much higher "terminal growth" than would otherwise be expected.

**Q. Why is this important in your DCF analysis?**

A. It is important because investors first determine the growth rate(s) they expect and then determine the price they are willing to pay for the gas LDC stocks. If growth and terminal prices ($P_4$) are expected to be higher, those investors will bid higher prices for the stocks and thus push down the dividend yield. Thus, to properly determine the equity cost with the DCF model, the analyst must first determine what investors expect with respect to growth and potential takeovers. And, if investors expect higher "growth" due to a chance that a premium will be paid if the firm is bought by another, the analyst must recognize such an expectation or the DCF equity cost will be understated.

**Q. What is the first growth rate in equation 3?**

A. The first growth rate provides a forecast of $D_1$ which is generally larger than the current dividend ($D_0$, in the terminology used above). I have adopted forecasts of $D_1$ made by Value Line as of December 31, 1999 for each of the gas LDCs in my sample. Generally,

(6) $D_1 = D_0 \times (1 + g_1)$

**Q. What is the second growth rate?**

A. The second growth rate is the one used to compute expected dividends for years 2001, 2002 and 2003 for the companies in the LDC sample. These growth rates are based on *Value Line* forecasts of the growth in dividends per share ("DPS") that increases $D_1$ (the *Value Line* forecast of the dividend for 2000) to the *Value Line* forecast of DPS expected to be paid in the year 2003 (actually, the average or mid-point of the period 2002 to 2004). With respect to the symbols in equation (3), the growth rate for each utility in the sample is used to compute dividend growth for $D_2$, $D_3$ and $D_4$.

**Q. What is the third growth rate?**

A. The third growth rate is the terminal growth rate that is expected to occur, on average, in all years after 2003. This terminal growth rate ($g^T$) is computed as a sustainable growth rate based on the following formula:

(7) $$g^T = BR_{2003} + VS + Z$$

where $BR_{2003}$ is the growth from forecasted retained earnings in the middle of the period 2002-2004 (year 2003), VS is growth from sales of stock above book value and Z is the difference between sustainable growth and growth expected to be derived from retained earnings computed with *Value Line* forecasts of ROEs, DPS and EPS for 2003. To be conservative, I do not assume investors expect to receive a premium if the individual gas LDCs are bought out by some other company. Instead, I base my analysis on the forecasts of terminal growth for those gas LDCs alone.

**Q. Please provide a more complete explanation of the Z term in equation (7).**

A. The Z term is included in equation (7) to recognize that a portion of sustainable growth that investors expect is not included in BR growth computed with forecasted dollar estimates of future DPS and future EPS for the period 2002-2004, *i.e.*, $BR_{2003}$. For gas LDCs, $BR_{2003}$ understates sustainable BR growth because it is computed with retention ratios that do not reflect other information indicating that EPS is growing faster than DPS.

The Z-term for a company is positive if EPS is growing more rapidly than DPS when the $BR_{2003}$ is determined[1]. In such a case, the sustainable retention ratio will be larger than is forecasted for the mid-point of the 2002-2004 period (*i.e.*, 2003). Table 1 shows that EPS (on average) for the sample of gas LDCs has grown more rapidly than DPS. Table 1 also shows that *Value Line* is

[1] In the case of electric utilities, at this time, the "Z" value for some of those companies is negative. In such a case an appropriate estimate of terminal growth is smaller than would be computed with the retention ratio forecasted for 2003. This is not the case for any of the gas LDCs in my sample.

forecasting EPS growth will exceed DPS growth during the period 1997 to 2003 and for the period 2000 to 2003[2]. If this differential in growth continues for even a short period, the average gas LDC will have higher sustainable growth than is indicated by the *Value Line* forecasts of B and R for the mid-point of the period 2002 to 2004 (*i.e.*, 2003). Thus, the terminal sustainable growth will be higher than BR growth forecasted using retention ratios derived from forecasts of DPS and EPS for 2003. This extra growth expected by investors but not captured in the $BR_{2003}$ + VS growth estimate based on data for 2003, is the Z growth.

Once Z is recognized, the sustainable growth rate becomes

(8) $g^T = BR + VS$

where BR is $BR_{2003}$ growth adjusted to reflect a more realistic retention ratio in the long-term. BR differs from $BR_{2003}$ in that it recognizes that until EPS and DPS are expected to grow at the same rate, sustainable growth is understated when earnings are expected to grow faster than dividends. In a period in which growth is sustainable, EPS, DPS and, for that matter, book value are all expected to grow at the same rate. The *Value Line* forecasts for 2003 I rely upon in my analysis show that DPS is not growing as rapidly as EPS and thus the future sustainable retention ratio will be higher than is forecasted for 2003.

**Q. Why have you chosen to use a multi-stage DCF model?**

A. For a number of reasons. One is that gas LDCs as well as other utilities are generally increasing dividends at a rate slower than earnings are growing. This practice increases the financial strength of the firms, will increase future retention ratios and thus enable future growth to exceed

[2] *Value Line* makes forecasts from 1996-1998 to the period 2002-2004. The year 1997 is an average for the period 1996-1998 and the year 2003 is an average of the forecasts for the period 2002-2004.

growth that is occurring today and has occurred in the past. The multi-stage growth DCF model allows a difference in current and future growth to be easily specified. If higher growth in the future is expected by investors (as I conclude it is), then the multi-stage growth DCF model allows the analyst to address this expectation directly. The forward-looking, multi-stage model provides a useful framework to address expected changes in future growth which cannot be addressed in a simple fashion with the single growth model[3].

Additionally, with respect to potential mergers, the multi-stage model allows the analyst to consider a takeover price (" $P_4$" in equation (3)). I do not, however, assume investors expect a premium in the takeover price in my analysis although such a consideration could be made with the multi-stage model. If investors expect even a low probability that a gas LDC will be purchased at a premium price, then the cost of equity for that gas LDC is higher than I estimate it to be.

**Q. In general, do you expect investors to rely upon past DPS growth or forecasts of DPS growth for short periods into the future as a measure of future terminal growth?**

A. No. The multi-stage-growth DCF model requires that the terminal growth rate be sustainable. In such a situation, EPS and DPS will grow at the same rate. An investor would not limit his/her determination of that terminal growth rate to DPS

[3] Realistically, with the known potential changes in future growth, investors would have to consider a multi-stage DCF model to be compute a long-term average "constant" growth in any case.

growth that has occurred in the past or that is forecasted to occur a few years into the future.

**Q. Would investors limit their determinations of sustainable growth to a consideration of only "BR" growth?**

A. No. Investors know that companies will achieve growth not only from retained earnings ("BR") growth but also from sales of stock above book value ("VS") growth. Myron Gordon, generally acknowledged to be the father of the modern DCF model, explained the reasons investors expect growth from both sources in his 1974 book, The Cost of Capital to a Public Utility.

**Q. Turn to your estimates of BR growth. Is EPS growth expected to be greater than DPS growth?**

A. Yes. Table 1 shows EPS growth has been higher than DPS growth in the past and is expected to be greater than DPS growth in the future. Columns A and B show that for most companies in the sample, and for the sample average, historical DPS growth has not been as rapid as historic EPS growth. Columns C, D, E and F provide *Value Line* forecasts of EPS and DPS growth for two different future periods. In both cases, an average of forecasted EPS growth rates exceeds the average of expected DPS growth rates.

Table 2 shows a significant ramification of those forecasts of earnings per share growth and dividends per share growth. On average, higher retention ratios are expected in the period 2003 (*i.e.*, an average for the period 2002-2004) than in the year 2000 and thus, all else the same, sustainable growth will be higher in the future.

**Q. Have you prepared an analysis of sustainable growth investors would expect if both the forecasts of EPS and DPS and the rates of growth in EPS and DPS are recognized?**

A. Yes, it is shown in Table 3. This table provides an estimate of the sustainable BR growth if DPS and EPS continue to grow at forecasted rates for a year past the end of the 2002-2004 period as well as if the differential in growth does not continue past 2004. The difference in the computed growth rates is the "Z" growth of equation (7) above. Table 1 shows that EPS is forecasted to grow at an average annual rate of 8.02% between the year 2000 and the year 2003 (mid-point of the period 2002-2004), whereas average DPS is forecasted to grow at only 3.13% per year in the same period. Assuming that forecasted growth in EPS and DPS continues for just one year past the end of the 2002-2004 period and thereafter both DPS and EPS grow at the same rate, the average of retention ratios in the long-term increases from .41 to .46. These averages are computed in columns (a) and (b) in Table 3. And, assuming the gas LDCs will continue to earn the ROEs forecasted by *Value Line* for the period 2002 to 2004, average terminal BR growth will be 6.30% instead of 5.59%.

**Q. Please turn to your determination of VS growth. Please explain why investors expect such growth?**

A. VS growth is the growth an investor can expect when a company issues shares of common stock at net prices above book value. VS growth is computed by multiplying V times S, where:

S = the percentage rate at which common stock is expected to be issued in the future, and

V = 1- (book value/net market value)

**Q. Is it reasonable to expect NW Natural and the other gas LDCs to issue shares of common stock in the future?**

A. Yes. NW Natural issued shares of common stock in 1995 and 1998 at prices above book value. It is reasonable to assume NW Natural and other LDCs will continue to issue new shares of common stock in the future.

**Q. Is it reasonable to assume that the shares will be sold at prices that exceed book value?**

A. Yes. Based on data in the C. A. Turner Utility Reports for December 1999, the current average market to book ratio for the sample of 12 LDCs is 1.77. *See* Table 4. It is unrealistic to assume investors expect current stock prices to drop to 56% of the value investors are currently willing to pay for those shares. If investors expect share prices are going to drop to book values, in an efficient market, the prices would never have reached today's level. As a result, it is reasonable to assume that investors will expect positive "VS" growth as well as "BR" growth in the future when they price stocks to produce the dividend yields also used in the DCF analysis.

**Q. What is your estimate of VS growth in the terminal period?**

A. I estimate VS growth for the average company in my sample of 12 gas LDCs will be 0.66 percent in the terminal period. I develop an estimate for each of the 12 companies and that average in Table 4.

**Q. What is shown in table 5?**

A. Table 5 reports an average of dividend yields based on prices during the period October 1999 through December 1999 and *Value Line's* December 31, 1999 forecasts of dividends for the next 12 months (*i.e.*, $D_1$) for each of the sample companies. I have used this set of average dividend yields to develop my DCF equity cost estimate for the sample of gas LDCs.

**Q. Please explain why you have used an average of three-month prices to compute the DCF dividend yield?**

A. Certainly. In general, current spot prices are expected to reflect fully all of the information available to investors. That does not, however, mean that regulators should rely upon dividend yields based on those spot prices. In general, it is more appropriate to base DCF estimates on an average of dividend yields for at least three reasons.

First, we do not have spot estimates of the growth rates that investors relied upon to produce the spot prices. Prices are a result of investors evaluating risk and growth prospects. I have used *Value Line* information to determine investor expectations about growth rates and that information – save for the information to update $D_1$ – is only updated every three months. Average prices based on a recent three-month period are generally a better match with those growth rates than are spot prices because we do not know the underlying spot growth rates which caused investors to bid the spot prices.

Second, spot prices do not recognize there is an ex-dividend effect embedded in all utility stock prices. All else the same, an investor will pay more for the stock when it is closer to its ex-dividend date. Using an average of dividend yields mitigates that ex-dividend effect.

Third, with an average of dividend yields, the full recent history of prices is the basis for the DCF estimate and not an arbitrary price that might inadvertently bias the equity cost estimate.

**Q. Do you have any concerns with using the three-month average dividend yield to make company-specific DCF estimates at this time?**

A. Yes. The growth rate forecasts and discussions of prospects for each of the gas LDCs in this particular case are current as of the December 24, 1999 *Value Line Investment Survey*. This new information about a company might cause a mis-match with the prices taken from the earlier period of October 1, 1999 to

December 23,1999 if investors' expectations about growth have changed as the result of the new *Value Line* information.

**Q. Please turn to your DCF estimates. How have you used the information on dividend yields and expected growth to estimate the cost of equity?**

A. My DCF equity cost range for a typical company in the sample of gas LDCs is shown in Table 6. Each equity cost is determined by solving for the discount rate (*i.e.*, the equity cost) that produces a present value of the future dividends which is equal to the current price. The method used in Table 6 is mathematically equivalent to solving for the internal rate of return consistent with the current average price and the multi-stage forecast of dividends for many periods into the future.

The average DPS growth rate adopted for the period 2000 to 2003 is from column E of Table 1. The 6.25% and 6.96% average terminal growth rates are derived in Table 3. The average dividend yield for the sample is developed in Table 5.

**Q. What is your estimated DCF equity cost range?**

A. My estimated DCF range is 10.9% to 11.6%. There is always considerably more uncertainty in making an equity cost estimate for one company instead of for a sample of comparable companies. Given this increased uncertainty with making a company-specific estimate, I adopt this range of equity costs as the most reliable measure of the range in which NW Natural's market (bare-bones) cost of equity falls today.

**Q. Is data for NW Natural generally consistent with its bare-bones cost of equity falling in a range of 10.9% to 11.6% at this time?**

A. Yes. Based on an average of recent prices for NW Natural common shares, terminal growth forecasts made available to investors on December 24, 1999

and the multi-stage DCF model, NW Natural's current indicated "bare-bones" cost of common equity is approximately 11.1%. Additionally, if investors had relied upon a constant growth DCF model and *Value Line's* forecasts of EPS growth shown in Table 1 of 6.0% for the period 1997 to 2003, or 5.8% for the period 2000 to 2003, with a current dividend yield in excess of 5.8%, the indicated equity costs would be in excess of 11.8% and 11.6%, respectively. These three indications of the cost of equity for NW Natural fall above or within my adopted range of 10.9% to 11.6%. If, however, the equity cost is based on the three-month average dividend yield of 5.25% developed in Table 5, each of the various estimates of the equity cost would be approximately 50 basis points lower. If all of this information is combined, the company-specific estimates of the cost of equity provide an equity cost range of 10.6% to 11.8% which overlaps the adopted equity cost range of 10.9% to 11.6%, and thus company-specific estimates of NW Natural's market cost of equity are not inconsistent with the range I adopt.

## IV. FLOTATION COSTS AND THE FAIR RATE OF RETURN.

**Q. In general, will an authorized common equity return that is set equal to the "bare-bones" cost of common equity provide a return that is large enough to provide fair compensation to stockholders?**

A. No, it will not. Flotation costs are incurred when common shares are issued. These flotation costs include the costs of issuing the securities and other costs, such as market pressure, which are not measured as easily. Because there are flotation costs, all dollars invested by common shareholders are not received by the utility and cannot be used to purchase earning assets. To provide a fair return to common shareholders, some method must be devised to compensate shareholders for all dollars invested.

**Q. Do any recent U.S. Supreme Court decisions indicate that flotation costs should be recognized when setting the fair rate of return on common stock equity?**

A. Yes. The Duquesne decision I discussed at the beginning of my testimony recognized that the cost of common stock equity was " . . . the return required to sell such stock upon reasonable terms in the market." If the utility is to provide investors with a fair return on dollars invested in new shares of common stock, potential flotation costs must be recognized. An upward adjustment to the market "bare-bones" cost of common equity return provides that compensation.

**Q. What issuance expenses do you estimate for typical utilities and NW Natural?**

A. I estimate that issuance expenses which have been and will be incurred by a typical utility fall in the range of 4 percent to 10 percent per issue. This range was estimated by Clifford Smith, Journal of Financial Economics, 5, 1977, Table 1, p. 277. Based on a review of past common stock issues by NW Natural, I estimate the company will incur issuance costs that fall in a range of 4% to 6%.

**Q. How have you used the information on issuance expenses to estimate the additional equity return required to compensate investors for flotation costs?**

A. I have used the following formula to make that estimate:

(9) $$r = [ (D1/P0) / (1-f) ] + g$$

where r = fair rate of return on common stock

f = flotation cost as a fraction, and

g = growth used in the DCF model.

This is the formula presented by Patterson (Journal of Finance, September 1983). Brigham, Aberwald and Gapenski have shown that this formula increases

the required return by just enough to provide investors an even chance to earn their cost of equity (Public Utilities Fortnightly, May 2, 1985).

**Q. What is your estimate of the range of fair rates of return based on your DCF equity cost estimates and the estimated flotation costs?**

A. For purposes of my analysis, I have limited flotation costs to issuance expenses and do not include market pressure costs which are not easily measured[4]. Based on expected issuance expenses of 4% to 6% for NW Natural, a dividend yield of 5.1% and a range of equity costs of 10.9% to 11.6%, equation 9 provides the basis to estimate a conservative range of flotation costs of 20 to 33 basis points[5]. I adopt 25 basis points as the minimum amount that should be recognized in converting a bare-bones market cost of equity into a fair rate of return to be used in a regulated proceeding.

## V. PERSPECTIVE AND SUMMARY.

**Q. Are there any recent studies that put your equity cost estimates in perspective?**

A. Yes. In the December 1998 issue of Public Utilities Fortnightly, Phillip S. Cross , a contributing editor of the journal, presents a compilation of recent ROE allowances for electric and gas distribution utilities. This compilation is especially useful because Mr. Cross provides notes next to each of those decisions. For example, those notes indicate unique situations in Massachusetts which had mandatory rate cuts and Vermont which imposed a 525 basis point penalty on Citizens Utilities (by cutting the 10.5% allowed ROE in half). Throwing out the

[4] If market pressure costs and other costs were included, the flotation cost adder would increase.

[5] Other flotation cost adjustment methods, such as the one WUTC Staff witness Richard Lurito proposed in past cases (*see*, for example, Dr. Lurito's testimony in U-89-3031-P, pages 33-34), would justify a flotation cost of no less than 50 basis points when investors could reasonably expect NW Natural to continue to issue common shares in the future. Thus, by comparison, the method I adopt here is conservative.

three highest and the three lowest authorized ROEs for gas LDCs, the authorized ROE range for cases in 1997 and 1998 is 10.7% to 12.5%. My estimates of the range for the bare-bones cost of equity as well as the fair rate of return for NW Natural falls well within this 10.7% to 12.5% range other Commissions have found to be reasonable for other gas LDCs. I have included a copy of this Public Utilities Fortnightly article in my exhibit.

**Q. Do the Commission determinations reported in the Public Utilities Fornightly article still provide a useful perspective?**

A. Yes. The average annual yields on 30-year Treasury securities were 6.61% and 5.63% in 1997 and 1998, respectively. Currently 30-year Treasury securities have yields above 6.5%. While there is not a basis point for basis point change in equity costs and Treasury security yields, the two costs are expected to move in the same direction and thus the information provided by the Public Utilities Fortnightly still provides a useful perspective.

**Q. What is your recommendation?**

A. I recommend the Washington Commission adopt an authorized ROE for NW Natural of no less than 11.25% at this time.

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

A. Yes.