CASCADE NATURAL GAS CORPORATION
Washington Utilities & Transportation Commission
2006 Rate Case Data Request

Request No. 241

Date prepared: October 3, 2006

Preparer: Dr. Morin

Likely Witness: Dr. Morin

Telephone: 206-616-5346

WUTC STAFF DATA REQUEST NO. 241:
Re: Witness Dr. Roger Morin

Referring to the statement in Dr. Morin's rebuttal testimony on page 15, lines 8 to 10, regarding increasing the dividend yield by one-half the expected growth rate, please identify all regulatory jurisdictions that have used this yield calculation.

Response: Dr. Morin did not conduct any comprehensive survey of jurisdictions as to whether the dividend yield component of the DCF model is grossed up by (1 + g) or by (1 + ½g). Regulatory commissions are naturally reluctant to divulge the computational details and the specifics of each methodology employed in arriving at their ROE determination. Understandably, they are normally reluctant to disseminate the details, methods, assumptions underlying their determination. As a general rule, commissions are not dogmatic as to which method they privilege or as to the specific mechanics of any one particular method. Dr. Morin is not aware of any recent published survey of how regulatory commissions derive their estimate of the allowed ROE, and there are very few explicit references to the relative use or non-use of various functional forms of DCF in the vast majority of rate orders.

Dr. Morin is aware that FERC once relied on the (1 + ½g) adjustment in its generic ROE model for electric utilities which it has since abandoned.

See the attached extract from Dr. Morin's most recent book The New Regulatory Finance that deals with this issue. This issue is also discussed in Parcell, D.C. "*The Cost of Capital – A Practitioner's Guide*," Prepared for the Society of Utility and Regulatory Financial Analysts, 1997.

CASCADE NATURAL GAS CORPORATION
Washington Utilities & Transportation Commission
2006 Rate Case Data Request

Extract from Chapter 11 of The New Regulatory Finance

11.2 Alternative DCF Models

Other alternative functional forms of the DCF model have been developed but are largely unrealistic and/or theoretically incorrect. These various models differ in the manner in which the dividend yield component is calculated. The continuous compounding DCF model, for example, is developed assuming that dividends are paid continuously at the current dividend rate rather than at discrete time intervals. The continuous DCF model has the following form:

$$K_c = D_0 / P_0 + g \qquad (11\text{-}5)$$

where : K_c = investor's expected return from the continuous DCF model
D_0 = annual per share dividend at time 0, that is, current dividend
P_0 = current stock price
g = constant expected growth rate in dividends

Clearly, this model does not reflect reality any more than does the annual DCF model, which assumes that dividends are paid once a year at the end of the year. The orthodox annual DCF model at least recognizes that dividends are paid discontinuously at discrete intervals rather than in a continuous manner, although it ignores the quarterly nature of dividend payments.

Another DCF model sometimes used by analysts, once used by the Federal Energy Regulatory Commission in its determination of the electric utility industry's generic rate of return on equity, lies halfway between the continuous and annual forms of the DCF model, and is frequently referred to as the "semi-annual compounding" or "half-year convention" model. It has the following form:

$$K_{adhoc} = D_0(1 + 0.5g) / P_0 + g \qquad (11\text{-}6)$$

where $K_{ad\,hoc}$ = investor's expected return from the ad hoc DCF model.

The origin of the model is as follows. Given the current annual dividend rate of D_0, there are five possible quarterly patterns of dividends to be received within the year, depending on where the company is within its quarterly dividend cycle. Letting d_0 be the quarterly dividend $D_0/4$:

Pattern	Expected Annual Dividend
1	$4\ d_0$
2	$3\ d_0 + 1\ d_0(1 + g)$
3	$2\ d_0 + 2\ d_0(1 + g)$
4	$1\ d_0 + 3\ d_0(1 + g)$
5	$0\ d_0 + 4\ d_0(1 + g)$
Sum	$10d_0 + 10d_0(1 + g)$
Average	$2d_0 + 2d_0(1 + g)$

Clearly from the above table, on average, the expected dividend is pattern No. 3:

$$2\ d_0 + 2\ d_0(1 + g) = 4d_0 + 2d_0g$$

Substituting $D_0 = 4d_0$ in the above equation, we obtain the average expected dividend:1

$$\text{Expected dividend} = 4d_0 + 2d_0g = 4\ D_0/4 + 2\ D_0/4g = D_0(1 + 0.5g)$$

This "ad hoc" DCF model is based on the arbitrary assumption that the firm is halfway into its quarterly dividend cycle and assigns half a year's growth to the dividend. It is justified when a DCF analysis is performed on a large group of comparable companies where it can be argued that, on average, companies are halfway through the dividend cycle. Another slight variation of the ad hoc DCF model is obtained by specifically recognizing the timing of dividends as well as the timing of dividend increases. Letting n equal the number of quarters since the last dividend increase, the model has the form:

$$K_{adhoc} = D_0(1 + n/4\ g)/P_0 + g \qquad (11\text{-}6A)$$

Neither DCF model reflects reality and both are arbitrary in nature. Only the quarterly DCF model reflects reality, is theoretically correct, and is computationally tractable.

1The same result is obtained by adding up the five possible dividends and dividing by five.