Dean J. Miller
Chas. F. McDevitt
McDEVITT & MILLER LLP
537 W. Bannock, Suite 215
P.O. Box 2564-83701
Boise, ID 83702
208.343.7500
208.336.6912 (Fax)

BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE APPLICATION OF UNITED WATER IDAHO INC. FOR APPROVAL OF INCREASED RATES FOR WATER SERVICE	))))	CASE NO. UWI-W-00-1

DIRECT TESTIMONY OF FRANK J. HANLEY

ON BEHALF OF UNITED WATER IDAHO INC.

February 2000

I. INTRODUCTION AND PURPOSE

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

A. My name is Frank J. Hanley and I am President of AUS Consultants - Utility Services. My business address is 155 Gaither Drive, P.O. Box 1050, Moorestown, New Jersey 08057.

Q. Please summarize your educational background and professional experience.

A. I have testified as an expert witness on rate of return and related financial issues before 31 state public utility commissions and the Federal Energy Regulatory Commission. I have also testified before local and county regulatory bodies, an arbitration panel, a U.S. Bankruptcy Court, the U.S. Tax Court and a state district court. I have appeared on behalf of investor-owned companies, municipalities, and state public utility commissions. The details of these appearances, as well as my educational background, are shown in Appendix A supplementing this testimony.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to provide evidence on behalf of United Water Idaho Inc. (UWID or the Company) as to the fair rate of return which it should be afforded an opportunity to earn on its rate base during the near-term future.

Q. Have you prepared an exhibit which supports your conclusions of your study?

A. Yes, I have. It has been marked for identification as Exhibit No. 18 (F. Hanley) which consists of 16 schedules.

II. SUMMARY

Q. Please summarize the overall cost of capital and fair rate of return resulting from the use of the September 30, 1999 consolidated actual capital structure of United Waterworks Company, parent of UWID, as well as its embedded cost rates of

long-term debt and minority interest and your recommended common equity cost rate.

A. As will be discussed infra, the capital structure and fixed capital cost rates have been provided to me by the Company. My recommended common equity cost rate applicable to the Company is 11.30% and the resultant overall cost of capital is 9.15% which is summarized on Exhibit No. 18 (F. Hanley), Schedule 1, page 1.

My use of the actual September 30, 1999 United Waterworks' consolidated capital structure is totally consistent with the approach to capital structure for UWID adopted by this Commission in Order No. 27617 dated July 6, 1998 in Case No. UWI-W-97-6. The consistent capital structure ratios and fixed capital cost rates were developed on Exhibit No. 18 (F. Hanley), Schedule 6, pages 1 and 2. My recommended common equity cost rate is 11.30%, the basis of which is summarized on Exhibit No. 18 (F. Hanley), Schedule 1, page 2.

My recommended common equity cost rate of 11.30% reflects current capital market conditions and results from the application of four well tested market-based cost of common equity models, the Discounted Cash Flow Model (DCF), the Risk Premium Model (RPM), the Capital Asset Pricing Model (CAPM), and the Comparable Earnings Model (CEM) and is applicable to a 43.07% common equity ratio. My recommended common equity cost rate is based upon two proxy groups of water companies.

UWID's common stock is wholly owned by United Waterworks (UWW). United Water Resources, Inc. (United Water) owns 100% of the common stock of UWW, which is the sole source of UWID's external capital. In light of its broad geographic and regulatory diversity, United Water is not an appropriate proxy for common equity cost rate and UWW's common stock is not traded. Thus, it is

appropriate to look to proxy groups of water companies whose common stocks are actively traded for insight into an appropriate common equity cost rate applicable to UWID and adjust it for investment risk differences. Moreover, the use of "comparable" risk firms as proxies is consistent with the principles of fair rate of return established in the Hope[1] and Bluefield[2] cases by the U.S. Supreme Court. As will be discussed infra, it is necessary to make adjustments for any investment risk differences which exist between the proxy groups and UWID because it is not possible to compile a proxy group which is precisely comparable to UWID. I rely upon a proxy group of four water companies and also a proxy group of six water companies covered by Value Line Investment Survey.

In formulating my recommended common equity cost rate, I relied upon all four cost of common equity models, namely the DCF, RP, CAPM and CEM applied to both proxy groups of water companies. I reviewed the results of each cost of common equity model in formulating my recommendation of common equity cost rate and concluded that if UWID were identical, or precisely comparable in risk to the proxy groups of water companies, its common equity cost rate would range from 10.9% to 11.4% (as shown on Exhibit No. 18 (F. Hanley), Schedule 1, page 2, Line No. 5). As will be explained infra, UWID viewed as a stand-alone company (which is appropriate since the rate of return will be applied to UWID's rate base) would be more risky than UWW and even more risky vis-a-vis the two proxy groups of water companies. In my judgment, UWID would have a Moody's credit rating of Baa1 if it issued long-term debt directly (in lieu of UWW which has an A3 Moody's rating), while the average

[1] Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591 (1944).

[2] Bluefield Water Works Improvement Co. v. Public Serv. Comm'n, 262 U.S. 679 (1922).

Moody's rating is A2 for each water proxy group. Thus, UWID's long-term debt would cost about 17 basis points more than the proxy groups and it is reasonable to assume that the equity cost would also be 17 basis points, or 0.17%, greater. The resultant range of common equity cost rate applicable to UWID is then from 11.07% to 11.57%. My single point estimate is 11.32%, rounded to 11.30%.

All cost of common equity models are based upon the Efficient Market Hypothesis (EMH) and therefore have application problems associated with them. The prudence of employing more than one cost of common equity model is affirmed by the financial literature. Moreover, the EMH, as will be discussed infra, requires the assumption that investors rely upon multiple cost of common equity models. Consequently, all of the models should be used to estimate investors' required rate of return on common equity capital. I rely upon a number of widely-used cost of common equity models as principal tools in reaching my recommendation because each provides useful data. None is theoretically superior to the others or so precise as to justify sole reliance on it in the context of the traditional ratemaking paradigm. The basis of my recommendation is summarized on Exhibit No. 18 (F. Hanley), Schedule 1, page 2.

I verify my recommendation as reasonable by using a test of pretax interest coverage.

	Proxy Group of Four Water Companies	Proxy Group of Six Value Line Water Companies
Discounted Cash Flow Model	7.1%	8.7%
Risk Premium Model	12.3	12.4
Capital Asset Pricing Model	11.3	11.5
Comparable Earnings Model	13.0	13.0
Cost Rate Before Investment Risk Adjustment	10.9%	11.4%
Investment Risk Adjustment	0.17	0.17
Common Equity Cost Rate After Investment Risk Adjustment	11.07%	11.57%
Midpoint of Range		11.32%
Recommendation		11.30%

III. GENERAL PRINCIPLES

Q. What general principles have you considered in arriving at your recommended common equity cost rate of 11.30% applicable to UWID?

A. In unregulated industries where the total price of a delivered product or service is not regulated, competition is the principal determinant in establishing the price. Traditionally, in the case of regulated public utilities, regulation acts as a substitute for the competition of the marketplace. Analyses based on market data are therefore imperative when estimating the common equity cost rate required by investors. Such a rate should be adequate enough to fulfill investors' requirements and assure that the utility will be able to fulfill its obligations to the public and provide adequate and dependable service at all times. Fulfillment of its service obligation requires a level of earnings sufficient to maintain the integrity of presently invested capital and permit the attraction of needed new capital at a reasonable cost in competition with other comparable-risk seekers of capital. These standards for a fair rate of return have been established by the

U.S. Supreme Court in the Hope and Bluefield cases cited supra.

IV. BUSINESS RISK

Q. Please define business risk and explain why it is important to the determination of a fair rate of return?

A. Business risk is a collective term encompassing all of the diversifiable risks of an enterprise other than financial risk. A few examples of business risk are source of supply and its cost and availability, general condition of the system, the quality of management and the quality of regulation. Business risk is important to the determination of a fair rate of return because the greater the level of business risk, the greater the rate of return investors demand, consistent with the basic financial precept of risk and return.

Q. Please discuss the business risks facing the water industry in general.

A. Standard & Poor's (S&P)[3] has stated that while most of the regulatory risk associated with the Safe Drinking Water Act are behind the industry, the industry still faces the risks related to replacing aging transmission and distribution systems. As S&P states[4]:

> Thus, there will always be a steady stream of rate cases. Another challenge is the possible move toward performance based ratemaking and whether water utilities can achieve the efficiencies necessary under this type of regulation to earn a reasonable equity return.

In addition, because the water industry is much more capital-intensive than the electric, natural gas or telephone industries, the investment required to produce a dollar of revenue is greater. Thus, the challenge to water utilities is significant.

As noted by S&P[5]:

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[3] Standard & Poor's, Utilities & Perspectives, September 22, 1997, pp. 1 and 3.

[4] Id., p. 1.

[5] Standard & Poor's, CreditWeek, June 20, 1994, p. 38.

> Additional challenges, such as limited growth prospects, regulatory lag, and low authorized returns and depreciation rates (about 2% versus around 3% for electric utilities), will continue to hamper financial performance in this highly capital-intensive business.

Lower depreciation rates, one of the principal sources of internal cash flow for all utilities, means that water utility depreciation as a source of internally-generated cash is far less than for electric, natural gas or telephone utilities. Water utilities' assets have longer lives and, hence, longer capital recovery periods. As such, water utilities face greater risk due to inflation which results in higher replacement cost per dollar of net plant than do other types of utilities.

In view of the foregoing, it is clear that, although water utilities have been traditionally perceived as relatively low business risk vis-a-vis other utilities, their high degree of capital intensity and substantial infrastructure capital spending, which will be necessary, requires regulatory support in the form of adequate and timely rate relief.

Q. In addition to the general risks facing the water industry, are there any unique risks which affect UWID?

A. Yes, I believe there are. The Company faces five major risk factors, in addition to its small size which will be discussed infra, which are unique to it.

First, the Company's largest customer, Micron Technology (Micron), has moved to become more water efficient and to supply its own water. As a result, annual revenues from Micron are lower by about $300,000 from previous years with no prospect for restoration to former levels of water use and resultant revenues.

Second, weather conditions have a significant effect upon UWID's revenues. The Company realizes about 70% of its annual revenues during the six month period of May to October due mainly to its dependence upon summer irrigation demand. Monthly production in the peak summer months is four times as large as monthly production during the winter. Because the region receives only approximately 12 inches of annual rainfall, UWID's revenues are particularly sensitive to unusually cool or wet weather in the summer months. In 1998, consumption was 1.12 billion gallons below an expected normal year.

Third, surface water rights are difficult to acquire and are increasingly costly both in terms of acquisition and in terms of any proposed modifications to existing rights. In addition, competition from speculative investors is a problem in growing areas throughout the west. Like other areas in the west where water commands thousands of dollars per acre foot, Boise faces competition for irrigation, anadromous fish, and recreation waters which have made any acquisition activity difficult and litigious. The uncertainty of the salmon recovery program in the state and the necessity for the government to obtain more water rights creates yet additional risk to UWID. As UWID continues to provide for the growing water needs of a growing community, it will be necessary to acquire water rights at market cost, which could escalate dramatically.

Fourth, UWID faces the risk that deregulation of the electric utility industry could raise power rates in Idaho, which is served by one of the nation's lowest cost producers of energy, Idaho Power Company. UWID's entire infrastructure has been built around inexpensive power. All system pressure must be pumped using electricity. A House Concurrent Resolution was passed which authorizes the Legislature to appoint a Committee to study restructuring. HB59 was

enacted to provide funding for the Committee's activity. If, during the course of electric utility deregulation, electrical costs in Idaho are normalized with the rest of the country, UWID's costs for electricity would almost double. Because this is one of UWID's biggest operating costs, it would adversely affect the Company's operating income if rates were not adjusted to compensate for such increase.

Fifth, the implementation of the proposed Radon requirement of the Safe Drinking Water Act will require either treatment on substantially all of UWID's ground water sources, the elimination of ground water sources, or the development of a multi-media public education program for all customers. The only question is, how costly will UWID's means of compliance be.

The above risks, along with its small size, clearly make UWID more risky than its parent, UWW. As a result, I believe that if UWID issued its own long-term debt and it were rated, it would be conservatively one rating notch lower than UWW's, i.e., it would be Moody's Baa1 versus UWW's A3.

Q. You mentioned UWID's small size as indicating greater business risk. Please explain why size has a bearing on business risk.

A. Smaller companies are less able to cope with significant events which affect sales, revenues and earnings.

Because UWID is the regulated utility against whose rate base the Commission's ultimately allowed overall cost of capital and fair rate of return will be applied, the relevant risk reflected in the cost of capital must be UWID's, including the impact of its small size on common equity cost rate. Size is an important factor which affects common equity cost rate. UWID is significantly smaller than either its parent, UWW (on a consolidated basis) or the average company in both proxy groups of water companies based on total investor-

provided capital as shown below:

	Total Capitalization ($ thousands)	Times Greater than UWID
United Waterworks, Inc. and Subsidiaries	493,876 (1)	3.9x
Proxy Group of Four water companies	285,713 (2)	2.2
Proxy Group of Six Value Line Water Companies	1,098,037 (3)	8.6
United Water Idaho	127,835 (4)	

(1) September 30, 1999 from Exhibit No. 18 (F. Hanley), Schedule 6, page 1.
(2) Year-end 1998 from Exhibit No. 18 (F. Hanley), Schedule 4, page 1.
(3) Year-end 1998 from Exhibit No. 18 (F. Hanley), Schedule 5, page 1.
(4) Year-end 1998 from Exhibit No. 18 (F. Hanley), Schedule 3.

The above data confirm that UWID is much smaller than its parent and both proxy groups.

Q. Does the financial literature affirm a relationship between size and common equity cost rate?

A. Yes. Brigham[6] states:

> A number of researchers have observed that portfolios of small-firms have earned consistently higher average returns than those of large-firms stocks; this is called "small-firm effect." On the surface, it would seem to be advantageous to the small firm to provide average returns in a stock market that are higher than those of larger firms. In reality, it is bad news for the small firm; what *the small-firm effect means is that the capital market demands higher returns on stocks of small firms than on otherwise similar stocks of the large firms.* (italics added)

In addition, Ibbotson Associates[7] states:

> One of the most remarkable discoveries of modern finance is the finding of a relationship between firm size and return. On average, small companies have higher returns than large ones. Earlier chapters document this phenomenon for the smallest stocks on the New York Stock Exchange (NYSE). *The relationship between firm size and return cuts across the entire*

[6] Eugene F. Brigham, Fundamentals of Financial Management, Fifth Edition, The Dryden Press, 1989, p. 623.

[7] Ibbotson Associates, Stocks, Bonds, Bills and Inflation - 1999 Yearbook, p. 127.

size of the spectrum; it is not restricted to the smallest stocks. (italics added)

In view of the foregoing, UWID's business risk is greater than the average companies in both proxy groups of water companies upon which I base my recommendation.

V. FINANCIAL RISK

Q. Please define financial risk and explain why it is important to the determination of a fair rate of return?

A. Financial risk is the additional diversifiable risk created by the introduction of debt into the capital structure.

Utilities formerly were considered to have much less business risk vis-a-vis unregulated enterprises, and, as a result, a larger percentage of debt capital was acceptable to investors. Standard & Poor's (S&P) current matrix approach to the bond rating process for utilities is contained in Exhibit No. 18 (F. Hanley), Schedule 2, pages 11 and 12, while pages 1 through 9 describe the rating process for utilities. As shown on page 12, S&P's new matrix approach to all types of utilities establishes financial target ratios for ten levels of business position/profile with "1" being considered lowest risk and "10" highest risk.

Q. How can one measure the combined, diversifiable business and financial risks, i.e., investment risk?

A. Similar bond ratings reflect similar combined business and financial risks. Although the specific business or financial risks may differ between companies, the same bond rating indicates that the combined risks are similar because the bond rating process gives recognition to diversifiable business and financial risks. For example, S&P expressly states that the bond rating process encompasses a

qualitative analysis of business and financial risks (see pages 3 through 9 of Schedule 2).

There is no perfect single proxy, such as bond rating or common stock ranking, by which one can differentiate common equity risk between companies. However, the bond rating provides a useful means to analyze common equity risk between companies because the bond rating is the result of a thorough and comprehensive analysis of all diversifiable investment risks, i.e., the sum of business and financial risks.

VI. UWID/UNITED WATERWORKS (UWW)

Q. Please describe UWID's operations.

A. UWID is an investor-owned public water utility that provided water service to 59,310 customers at December 31, 1998. Its common stock is not traded as it is owned by UWW, which is the sole source of all UWID's external capital. UWW's common stock is owned by United Water Resources (UWR). On its own books, UWID is carried as 100% common equity. However, since all of UWID's external capital requirements are provided by its parent, UWW, I have shown on Schedule 3 capitalization and return rates on average common equity (ROE) for UWID. In so doing, I used UWID's total permanent capital as shown on its annual reports to the Idaho Public Utilities Commission and allocated that capital in each year, in accordance with UWW's actual consolidated permanent capital structure ratios in each year. As shown on Schedule 3 of Exhibit No. 18 (F. Hanley), for the five years ended 1998, UWID's average ROE was just 5.9% ranging from a low of 5.0% in 1995 to a high of only 8.1% in 1994, all of which were far below those experienced by the proxy groups of water companies as discussed infra.

Approximately 86% of UWID's customers are residential and highly dependent upon seasonal weather conditions as the Company realizes approximately 70% of annual revenues from May through October. In this regard, UWID faces above average risk attributable to seasonal conditions. Combined with its small size, reduced usage by Micron, the potential adverse impact of electric deregulation, the uncertainty surrounding availability and costs to acquire surface water rights, and the uncertainty regarding potential cost impact of compliance with the radon provision of the Safe Drinking Water Act, UWID's risks are, I believe, unique and above average.

VII. PROXY GROUPS

Q. Please explain how you chose the proxy group of four water companies.

A. The bases of selection for the proxy group of five water companies were those domestic water companies that meet the following criteria: 1) they are included in S&P's Compustat Services, Inc., PC Plus Database; 2) they have an assigned an S.I.C. Code of 4941 (Water Supply) by S&P's Compustat Services, Inc.; 3) they have common stock which is actively traded; 4) they do not operate in California; and 5) they operate in no more than two states. Four companies met all of these criteria. Their financial profile is summarized on Exhibit No. 18 (F. Hanley), Schedule 4, page 1.

Q. Explain how the second proxy group of water companies was selected.

A. I chose to observe the market indicators of common equity cost rate of a proxy group of nationally-recognized water companies, namely those companies for which Value Line Investment Survey currently publishes a Ratings and Report on a quarterly basis. There are six such companies and their financial profile is summarized on Exhibit No. 18 (F. Hanley), Schedule 5, page 1.

Q. Please describe Schedule 4 of Exhibit No. 18 (F. Hanley).

A. Schedule 4 contains comparative capitalization and financial statistics for the four water companies for the years 1994 through 1998. The schedule consists of two pages. Page 1 contains a summary of the comparative data for the years 1994-1998, while page 2 contains notes relevant to page 1, the basis of selection of the individual companies in the proxy group and their identities.

During the five-year period ending 1998, the achieved average earnings rate on book common equity (ROE) averaged 11.2% relative to an average common equity ratio of nearly 47% based on permanent capital employed. The achieved ROE ranged from 10.6% in 1996 to 12.0% in 1998 in contrast to the UWID range of from 5.0% to 8.1% and average of 5.9% over the same five-year period. The five-year average market/book ratio ending 1998 was 154.5% (see discussion relative to market/book ratios and applicability of a market-based common equity cost rate to book value, infra). Coverage of interest charges, excluding all AFUDC from income available to pay such charges, before income taxes for the years 1994-1998 ranged between 3.11 and 3.36 times and averaged 3.28 times during the five-year period.

Q. Please describe Schedule 5 of Exhibit No. 18 (F. Hanley).

A. Schedule 5 contains comparative capitalization and financial statistics for the six Value Line water companies for the years 1994 through 1998. The schedule consists of two pages. Page 1 contains a summary of the comparative data for the years 1994-1998. Page 2 contains notes relevant to page 1, as well as the basis of selection of the individual companies in the proxy group and their identities.

During the five-year period ending 1998, the achieved average ROE

ranged between 9.7% in 1994 and 11.7% in 1998, and averaged 10.7% (far greater than UWID's average of 5.9% as discussed supra), relative to an average common equity ratio based on permanent investor-provided capital of 43.4%. The five-year average market/book ratio ending 1998 was 162.2%.

VIII. CAPITAL STRUCTURE RATIOS

Q. Please explain Exhibit No. 18 (F. Hanley), Schedule 6.

A. Schedule 6 consists of four pages. Page 1 shows UWW's actual capital structure and related ratios at September 30, 1999 based on investor-provided capital. Page 2 contains the composite cost of long-term debt and minority interest. All of the information shown on pages 1 and 2 was provided by the Company. Pages 3 and 4 contain the permanent capital structure ratios by company and year for the period 1994-1998, inclusive, for each company in the two proxy groups of water companies as well as group averages.

Q. Please explain why UWW's capital structure ratios are appropriate to use in determining UWID's overall cost of capital.

A. The price of service should be cost-based and company-specific to the greatest extent possible and reflect the mix of capital financing the Company's rate base. When an operating utility issues its own senior capital in the capital markets, it is proper for rate of return purposes to employ the capital structure ratios and related fixed capital cost rates of the regulated operating utility. However, when the parent provides all of the operating utility's external capital, it is appropriate to employ the capital structure and fixed capital cost rates of the parent and its subsidiaries on a consolidated basis for rate of return purposes. The per books capital structure of UWID consists of 100% common equity. All external capital requirements of UWID and UWW's other operating subsidiaries are raised by

UWW. Therefore, it is appropriate that the consolidated capital structure ratios of UWW be employed when determining the overall cost of capital for UWID. This concept is consistent with the findings of the Idaho Public Utilities Commission in its July 6, 1998 Order No. 27617 in Case No. UWI-W-97-6 as mentioned supra.

Q. How does UWW's actual September 30, 1999 common equity ratio of 43.07% compare with the common equity ratios maintained by the proxy groups of water companies?

A. UWW's actual common equity ratio at September 30, 1999 of 43.07% is conservatively consistent vis-a-vis the average common equity ratios maintained by the companies in the proxy groups e.g., the 1998 average common equity ratios based on permanent capital of 45.62% for the proxy group of four companies (Schedule 6, page 3) and 44.03% for the proxy group of six Value Line companies (Schedule 6, page 4). Consequently, I believe UWID's ratemaking common equity ratio of 43.07% is reasonable given UWID's relatively small size and unique business risks discussed supra.

Q. How do UWID's ratemaking capital structure ratios based upon UWW's actual capital structure at September 30, 1999 compare with S&P's new utility group financial targets?

A. They are conservatively consistent with S&P's target range of total debt to total capital for a utility with long-term debt rated in the A category (see page 2, Note 8 of Schedule 14 of Exhibit No. 18 (F. Hanley)) and a business profile of 3, that of UWW. As shown on page 12 of Schedule 2, a utility with a business position of 3 requires a range of total debt to total capital ratio of 47.5%-53.0% in order to maintain an A bond rating. This implies the need for a range of total equity of from 47.0% to 52.5%. UWW's total equity is 43.19% (43.07% common equity

plus 0.12% minority interest). Thus, the 43.07% common equity ratio at September 30, 1999 is reasonable and prudently minimizes the revenue cost of capital.

A. Long-Term Debt/Minority Interest Cost Rates

Q. What cost rates for long-term debt and minority interest are appropriate for use in determining UWID's overall cost of capital?

A. Actual long-term debt/minority interest cost rates of 7.52% and 5.00%, respectively, at September 30, 1999 are appropriate as shown on Exhibit No. 18 (F. Hanley), Schedule 6, page 2.

IX. COMMON EQUITY COST RATE MODELS

A. The Efficient Market Hypothesis (EMH)

Q. Are all of the models you employ market-based models?

A. Yes. The DCF model is market-based as current market prices are employed. The Risk Premium Model (RPM) is market-based as the current and expected bond yields reflect the market's assessment of risk. To the extent betas are used to determine equity risk premium, the market's assessment is reflected because betas are derived from regression analyses of market prices. The Capital Asset Pricing Model (CAPM) model is market-based for much the same reason as the RPM except that the yield on U.S. Government Treasury Bonds is used in lieu of company-specific bond yields. My application of the comparable earnings model (CEM) is also market-based because the selection process of comparable risk companies is based upon statistics which result from regression analyses of market prices. All of the models are, therefore, based upon the Efficient Market Hypothesis (EMH).

Q. Please describe the conceptual basis of the EMH.

A. The EMH is the cornerstone of modern investment theory. It was pioneered by Eugene F. Fama[8] in 1970. An efficient market is one in which security prices at all times reflect all the relevant information at that time. An efficient market implies that prices adjust instantaneously to the arrival of new information and security.[9]

The essential components of the EMH are:

1. Investors are rational and will invest in assets which provide the highest expected return for a particular level of risk.

2. Current market prices reflect all publicly available information.

3. Returns are independent in that today's market returns are unrelated to yesterday's returns as that information has already been processed.

4. The markets follow a random walk, i.e., the probability distribution of expected returns approximates the normal bell curve.

Brealey and Myers[10] state:

> When economists say that the security market is 'efficient', they are not talking about whether the filing is up to date or whether desktops are tidy. They mean that information is widely and cheaply available to investors and that all relevant and ascertainable information is already reflected in security prices.

There are three forms of the EMH, namely:

1. The "weak" form asserts that all past market prices and data are fully reflected in securities prices. In other words, technical analysis cannot enable an investor to "outperform the market".

2. The "semistrong" form asserts that all publicly available information is fully reflected in securities prices. In other words,

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8 Fama, Eugene F., "Efficient Capital Markets: A Review of Theory and Empirical Work". Journal of Finance, May 1970, 383-417.

9 Morin, Roger A., "Regulatory Finance - Utilities' Cost of Capital". Public Utilities Reports, Inc., 1994, 136.

10 Brealey, R.A. and Myers, S.C., "Principles of Corporate Finance". McGraw-Hill Publications, Inc., 1996, 323-324.

fundamental analysis cannot enable an investor to "outperform the market".

3. The "strong" form asserts that all information, both public and private, is fully reflected in securities prices. In other words, even insider information cannot enable an investor to "outperform the market".

The “semistrong” form is generally held as true because the use of insider information (even though illegal) can often enable an investor to "beat the market" and earn excessive returns, thereby disproving the “strong” form.

The paradox of efficient markets is that if every investor believed the markets were efficient, then they would not be efficient because no investors would bother to analyze securities. In effect, efficient markets depend on market participants who believe they are inefficient and trade securities is an attempt to outperform the market.

Q. Please explain the applicability of the EMH to your determination of common equity cost rate.

A. Common sense affirms the conceptual basis of the EMH as described above. In practical terms, this means that market prices paid for securities reflect all relevant information available to investors. The generally-accepted "semistrong" form of the EMH is also affirmed by common sense, i.e., that prices reflect all publicly-available information and no degree of sophistication and/or analysis can enable an investor to outperform the market. This means that all perceived risks are taken into account by investors in the prices paid for their securities. Investors are aware of all publicly-available information including bond ratings; discussions about the companies by bond rating agencies and financial analysts who follow the companies and an awareness of the various methodologies discussed in the financial literature to determine common equity cost rate. This means that the results of multiple cost of common equity models should be taken into account.

Q. Is there specific support in the academic literature for the need to rely upon multiple models in arriving at a recommended common equity cost rate?

A. Yes. For example, Phillips[11] states:

> Since regulation establishes a level of authorized earnings which, in turn, implicitly influences dividends per share, *estimation of the growth rate from such data is an inherently circular process. For these reasons, the DCF model "suggests a degree of precision which is in fact not present" and leaves "wide room for controversy and argument about the level of k".* (italics added) (p. 396)
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> * * *
>
> *Despite the difficulty of measuring relative risk, the comparable earnings standard is no harder to apply than is the market-determined standard. The DCF method, to illustrate, requires a subjective determination of the growth rate the market is contemplating. Moreover, as Leventhal has argued: 'Unless the utility is permitted to earn a return comparable to that available elsewhere on similar risk, it will not be able in the long run to attract capital*.' (italics added) (p. 398)

Also, Morin[12] states:

> Sole reliance on the DCF model ignores the capital market evidence and financial theory formalized in the CAPM and other risk premium methods. The DCF model is one of many tools to be employed in conjunction with other methods to estimate the cost of equity. *It is not a superior methodology that supplants other financial theory and market evidence. The broad usage of the DCF methodology in regulatory proceedings does not make it superior to other methods.* (italics added) (pp. 231-232)
>
> Each methodology requires the exercise of considerable judgment on the reasonableness of the assumptions underlying the methodology and on the reasonableness of the proxies used to validate a theory. *The failure of the traditional infinite growth DCF model to account for changes in relative market valuation, discussed above, is a vivid example of the potential shortcomings of the DCF model when applied to a given company. It follows that*

[11] Charles F. Phillips, Jr., The Regulation of Public Utilities-Theory and Practice, 1993, Public Utility Reports, Inc., Arlington, VA, p. 396, 398.

[12] Roger A. Morin, Regulatory Finance-Utilities' Cost of Capital, 1994, Public Utilities Reports, Inc., Arlington, VA, pp. 231-232, 239-240.

> *more than one methodology should be employed in arriving at a judgment on the cost of equity and that these methodologies should be applied across a series of comparable risk companies. ...Financial literature supports the use of multiple methods.* (italics added) (p. 239)

Professor Eugene Brigham, a widely respected scholar and finance academician asserted:

> *In practical work, it is often best to use all three methods - CAPM, bond yield plus risk premium, and DCF* - and then apply judgement when the methods produce different results. People experienced in estimating capital costs recognize that both careful analysis and very fine judgements are required. It would be nice to pretend that these judgements are unnecessary and to specify an easy, precise way of determining the exact cost of equity capital. Unfortunately, this is not possible. (italics added) (pp. 239-240)

Another prominent finance scholar, Professor Stewart Myers, in his best-selling corporate finance textbook stated:

> *The constant growth formula and the capital asset pricing model are two different ways of getting a handle on the same problem.* (italics added) (p. 240)

In an earlier article, Professor Myers explained the point more fully:

> *Use more than one model when you can. Because estimating the opportunity cost of capital is difficult, only a fool throws away useful information. That means you should not use any one model or measure mechanically and exclusively. Beta is helpful as one tool in a kit, to be used in parallel with DCF models or other techniques for interpreting capital market data.* (italics added) (p. 240)

In view of the foregoing, it is clear that investors are aware of all of the models including comparable earnings. The EMH requires the assumption that collectively, investors use them all.

Q. Is there any evidence that many regulatory commissions rely upon multiple models in order to formulate allowed common equity cost rates?

A. Yes. Exhibit 18 (F. Hanley), Schedule 7, which consists of 3 pages, represents the most recent compilation by the National Association of Regulatory Utility

Commissioners of the methodologies applied by regulatory agencies in the United States and Canada. As can be gleaned from page 2, the majority of commissions rely upon multiple models. Indeed, the majority of commissions actually specify that no one method is relied upon, but rather that all are considered.

B. Discounted Cash Flow Model (DCF)

1. Theoretical Basis

Q. What is the theoretical basis of the DCF model?

A. DCF theory is based upon finding the present value of an expected future stream of net cash flows during the investment holding period discounted at the cost of capital, or the capitalization rate. The theory suggests that an investor buys a stock for an expected total return rate which is expected to be derived from cash flows in the form of dividends and appreciation in market price (the expected growth rate). Thus, the dividend yield on market price plus a growth rate equals the capitalization rate. The capitalization rate is the total return rate expected by investors.

Q. Please comment on the applicability of the DCF model in establishing a cost of common equity for UWID.

A. The DCF model has a tendency to mis-specify investors' required return rate when the market value of common stock differs significantly from its book value. Market values and book values of common stocks are seldom at unity. For example, the market values of the water companies in the two proxy groups have common stocks that have been selling well in excess of their book values. As shown on page 1 of Schedules 4 and 5, the average market/book ratios for the five years ending 1998 were 154.5% and 162.2% while for the year 1998 they

were 181.1% and 207.8% for the four water companies and the six Value Line companies, respectively. The market-based DCF model will result in a total annual dollar return on book common equity equal to the total annual dollar return expected by investors only when market and book values are equal. There are many macroeconomic factors which influence market values. Regulatory allowed earnings can influence market values but cannot control them (refer to Bonbright, et al citation infra).

2. Applicability of a Market-Based Common Equity Cost Rate to a Book Value Rate Base

Q. Is it reasonable to expect the market values of utilities' common stocks to continue to sell well above their book values?

A. Yes. Despite the current and recent great volatility of the stock market, I believe that the common stocks of utilities will continue to sell substantially above their book values, because many investors are in for the long-haul, saving for retirement, etc. The significant increases in market-to-book ratios have been influenced by factors other than fundamentals such as actual and reported growth in earnings per share (EPS) and dividends per share (DPS). For example, in a Wall Street Journal cover page article of March 30, 1999 entitled, "If This is a Bubble, it Sure is Hard to Pop" by David Wessel, the following excerpts, with which I agree, are contained:

> So if the fundamentals aren't driving stock prices, then what is? It's that hard-to-quantify investor appetite for buying stocks. The market has been strong because lots of people want to hold stocks. It will continue to be strong as long as they continue to be willing to pay more for stocks than they used to.
>
> *********
>
> Psychoanalyzing investors is a favorite pastime, from Wall Street saloons to American livingrooms. Perhaps baby boomers, intent

> on saving for retirement and their children's college tuition, see stocks as the only smart alternative. Perhaps Generation-Xers fear Social Security will vanish before they retire, and are bulking up on stocks. Perhaps mutual-fund marketing has diverted billions of dollars that once would have ended up in low-interest bank accounts. Perhaps the internet age has dispelled the mystique of the stock market; everyone can do it.

Q. Have you compiled any empirical evidence which demonstrates that the market prices of common stocks have not been driven only by growth in EPS and/or DPS?

A. Yes. That information is shown on Exhibit No. 18 (F. Hanley), Schedule 8, I have shown by quarter, beginning with the second quarter of 1989 through the second quarter of 1999, the stock price indices levels of both the S&P Utilities and the S&P 500 Composite. Also shown for each are the earnings and dividends per share. As shown at the bottom of Schedule 8, the S&P Utilities Index market price increased by 94.69% over the period, while earnings per share increased by only 30.96% and dividends increased by just 31.61%. Also shown for the S&P 500 Composite Index is that the price index increased by 331.70% over that period while earnings per share increased just 62.65% and dividends per share increased only 59.71%.

It is clear from the foregoing that there are many factors which influence market prices and that the allowed (or indeed even achieved) rates of return on book equity have a limited effect on utilities' market-to-book ratios, as the market prices of common stocks are influenced by many, many factors which are beyond the direct influence of the regulatory process.

Q. Is there any support in the academic literature to support your contention?

A. Yes. For example, Phillips[13] states:

> Many question the assumption that market price should equal book value, believing that 'the earnings of utilities should be

[13] Charles F. Phillips, Jr., The Regulation of Public Utilities - Theory & Practice, 1993, Public Utilities Reports, Inc., Arlington, VA, p.395.

> sufficiently high to achieve market-to-book ratios which are consistent with those prevailing for stocks of unregulated companies.'

In addition, Bonbright[14] states:

> In the first place, commissions cannot forecast, except within wide limits, the effect their rate orders will have on the market prices of the stocks of the companies they regulate. In the second place, *whatever the initial market prices may be, they are sure to change not only with the changing prospects for earnings, but with the changing outlook of an inherently volatile stock market*. In short, market prices are beyond the control, though not beyond the influence of rate regulation. (italics added)

Q. If regulatory allowed earnings have no direct control over market values, does a DCF cost rate understate investors' required return when it is applied to a book value significantly lower than market value?

A. Yes. Under the DCF model, the rate of return investors require is related to the price paid for a stock. Thus, market price is the basis upon which investors formulate their required rate of return. A regulated utility is limited to earning on its net book value (depreciated original cost) rate base. As discussed supra, market values diverge from book values for many reasons unrelated to ROEs. Thus, when market values are grossly disparate from their book values, a market-based DCF cost rate applied to the book value of common equity will not reflect investors' expected common equity cost rate. It will either overstate the common equity cost rate (without regard to any adjustment for flotation costs which may, at times, be appropriate on an ad hoc basis) when market value is less than book value or understate the cost rate when market value is above

[14] James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates, 1988, Public Utilities Reports, Inc., Arlington, VA, p. 334

book value.

Schedule 9 of Exhibit 18 (F. Hanley) demonstrates on a hypothetical basis the inadequacy of a market-based DCF cost rate applied to a much lower book value. It demonstrates that there is no realistic opportunity to earn the market-based rate of return on book value. In this hypothetical example, market price is 60% in excess of book value and the investor expects a total return rate of 10.60%, based on a growth rate of 5.40% and a dividend yield of 5.20% on market price. In this example, the 10.60% market-based cost rate implies an annual return of $2.544 consisting of $1.248 in dividends and $1.296 in growth (market-price appreciation). When the 10.60% return rate is applied to the book value, which is only 62.5% of the market value, the opportunity for total annual return is just $1.590 on book value. With an annual dividend of $1.248, there is an opportunity to earn only $0.342 in growth which is just 1.43% on market price in contrast to the 5.40% growth in market price expected by investors. There is no way to possibly achieve the expected growth of $1.296 (5.40%) related to the market price of $24.00 absent a huge cut in the annual cash dividend, an unreasonable expectation since such an action by a board of directors is usually indicative of an extremely adverse financial condition. Of course, if the converse situation exists (market prices substantially below their book values), a market-based DCF cost rate applied to the book value of common equity would overstate the cost rate.

3. Applications of the DCF Model

a. Dividend Yield

Q. What are the results of your applications of the DCF model?

A. They are 7.1% based on the proxy group of four water companies and 8.7%

based on the proxy group of six Value Line companies as shown on Schedule 10 of Exhibit No. 18 (F. Hanley).

Q. What was the basis for the unadjusted dividend yields of 3.8% and 3.4% shown on Line Nos. 1 and 6 of Schedule 10?

A. The recent volatility of the stock market confirms that current or spot prices should not be relied on but that representative dividend yields should be used. Consequently, I used an average of a recent spot date (December 1, 1999) and the three, six, and twelve months ended November 30, 1999 as shown on Schedule 11 of Exhibit No. 18 (F. Hanley).

b. Discrete Adjustment of Dividend Yield

Q. Please explain the adjustments for discrete growth of 0.1% shown on Line Nos. 2 and 7 of Schedule 10.

A. Due to the fact that dividends are paid quarterly, or periodically, as opposed to continuously (daily), an adjustment must be made. This is often referred to as the discrete, or the Gordon Periodic, version of the DCF model.

Since the companies in the proxy group increase their quarterly dividend at different times of the year, a reasonable assumption is to reflect one-half the annual dividend growth rate in the D_1 expression, or $D_{1/2}$. This is a conservative approach so as not to overstate the dividend yield as it should be representative of the next twelve-month period. For example, the actual average dividend yield for the proxy group of four water companies of 3.8% on Line No. 1 of Schedule 10 relative to the proxy group of four water companies has been adjusted upward to reflect one-half the growth rate shown on Line No. 4 of Schedule 10, or 0.1%. The resultant adjusted dividend yield of 3.9% is shown on Line No. 3 of Schedule 10. The similarly calculated adjusted yield for the proxy group of six Value Line

companies is 3.5%.

c. DCF Growth Rates

Q. Please explain the basis of the growth rates which you used in your applications of the DCF model as shown on Line Nos. 4 and 8 of Schedule 10.

A. It is shown on Schedule 12 that on average, individuals own 88% of the common shares of the proxy group of four water companies and 78% of the proxy group of six Value Line companies. Individual investors are more likely to rely on information provided by sophisticated securities analysts than perhaps are institutional investors. I reviewed an average of five-year historical as well as projected growth rates in earnings per share (EPS), dividends per share (DPS) and retention growth plus accretion (BR + SV). Also, because it has become more apparent than ever that individuals get their information readily from all forms of media and recognize that analysts' forecasts provide the only meaningful insight into future growth, especially in a rapidly changing regulatory environment. Investors' cognizance is heightened by a general awareness of regulatory changes even though largely related to the energy industries. Moreover, they recognize that analysts' forecasts are readily available to individuals from such sources as Value Line and via the Internet. As a result, I believe it is clear that forecasted earnings growth (EPS) is also a highly relevant indicator of growth for use by investors today in formulating future growth expectations. Schedule 13, page 1 contains a summary of all the growth rates which I considered in arriving at my conclusions of growth for use in the DCF model. Pages 2 through 8 contain supporting information while pages 9 through 14 of Schedule 13 contain the most current Value Line pages for the six water companies covered by Value Line.

4. Conclusion of DCF Cost Rates

Q. Please summarize your DCF cost rates.

A. As shown on Line No. 11 of Schedule 10, the DCF cost rates are 7.1% for the proxy group of four water companies and 8.7% for the proxy group of six Value Line water companies. Common sense affirms the EMH mandate that all cost of equity models be considered. These DCF cost rates, of and by themselves, make no sense when compared to much less risky alternative investment opportunities. For example, it is shown on Schedule 14, page 7 that recent yields on corporate Baa rated bonds have been above 8.0% and are expected by economists to remain on average at about the recent levels. As shown on Schedule 14, page 4, yields on public utility bonds consistently exceed those on corporate bonds. Thus, such DCF results make no sense in the context of the risk/return principle of finance.

C. The Risk Premium Model (RPM)

1. Theoretical Basis

Q. Please describe the theoretical basis of the RPM.

A. The RPM is based upon the theory that the cost of common equity capital is greater than the prospective company-specific cost rate for long-term debt capital. In other words, it is the expected cost rate for long-term debt capital plus a premium to compensate common shareholders for the added risk of being unsecured and last-in-line in any claim on the corporation's assets and earnings.

Q. Some analysts state that the RPM is another form of the CAPM. Do you agree?

A. Generally yes, but there is a very significant distinction between the two models. The RPM and CAPM both add a "risk premium" to an interest rate. However, the beta approach to the determination of an equity risk premium in the RPM should

not be confused with the CAPM. Beta is a measure of systematic, non-diversifiable, market risk which is usually a much smaller percentage of total investment risk, the sum of both diversifiable and non-diversifiable risks. Diversifiable, i.e., unsystematic or company-specific risk, is fully reflected in the RPM by the use of the prospective *company-specific* long-term bond yield because the bond rating process reflects an assessment of all diversifiable business and financial risks as can be gleaned from S&P's description of the bond rating process shown in Exhibit No. 18 (F. Hanley), Schedule 2 especially at pages 3 through 9. In contrast, the use of a U.S. Government Security as the risk-free rate of return in the CAPM reflects no diversifiable *company-specific* risk. Consequently, although similar in a very broad way, they are actually two separate and distinct cost of common equity models and recognized as such in the financial literature. Moreover, the "semistrong" form of the EMH, which is the foundation upon which all the market-based models are built, mandates that investors take into account all publicly available information. Consequently, investors are aware that the financial literature discusses the various models and actually encourages their use.

Q. Please describe your RPM analysis.

A. The results of my RPM analysis are contained in Exhibit No. 18 (F. Hanley), Schedule 14 which consists of 9 pages. As can be gleaned from page 1, I have estimated the prospective bond yield consistent with the proxy group's average Moody's bond rating of A2. I then calculated the applicable equity risk premium. The sum of the prospective bond yield and equity risk premium equals the RPM-derived common equity cost rate.

2. Estimation of Expected Bond Yield

Q. Please explain the basis of the expected bond yield of 7.9% applicable to the average proxy group company which you employ.

A. Because the cost of common equity is prospective, a prospective yield on similarly-rated long-term debt is appropriate. As shown on Schedule 14, page 2, the average Moody's bond rating for both proxy groups is A2. I relied on a consensus forecast of about 50 economists of the expected yield on Aaa rated corporate bonds for the six calendar quarters ending with the first calendar quarter of 2001 as derived from the December 1, 1999 Blue Chip Financial Forecasts (shown on page 7 of Schedule 14). As shown on Line No. 1 of page 1 of Schedule 14, the average expected yield on Aaa rated corporate bonds is 7.3%. It is necessary to adjust that average yield to be equivalent to an A2 rated public utility bond. Consequently, an adjustment was required to the average prospective yield on Aaa rated corporate bonds. It is shown on Line No. 2, page 1 of Schedule 14 and explained in Note 2 at the bottom of the page. After such adjustment, the expected bond yield applicable to the average company in each proxy group is 7.9% as shown on Line No. 5, page 1 of Schedule 14.

3. Estimation of the Equity Risk Premium

Q. Please explain the basis of the equity risk premiums which you used.

A. I evaluated the results of two different historical equity risk premium studies, as well as Value Line's forecasted total annual return on the market over the prospective yield on high grade corporate bonds, as detailed on pages 5, 6 and 8 of Schedule 14. As shown on Line No. 3, page 5 of Schedule 14, the average equity risk premiums based on those studies are 4.4% and 4.5%. They are the result of the average of a beta-derived average of historical and forecasted total

market equity risk premiums and the mean historical equity risk premium based on holding period returns applicable to public utilities with bonds rated A.

Q. Please explain the basis of the equity risk premiums of 4.0% and 4.2% determined by the beta approach as shown on Line No. 1, page 5 of Schedule 14.

A. Equity risk premiums determined through the application of beta are highly relevant as they are derived from the market prices of common stocks over a recent five-year period. The market prices reflect investors' long-term future investment horizon. Beta is a meaningful measure of prospective relative risk to the market as a whole and is a logical means by which to allocate a relative share of the market's total equity risk premium.

The average total market equity risk premium utilized was 8.0% and is based upon an average of both the long-term historical premium of 7.1% and the forecasted market risk premium of 8.9%, or 8.0% as shown on page 6, Line No. 7 of Schedule 14.

To derive the historical market equity risk premium, I used the most recent Ibbotson Associates' data on holding period returns for the S&P 500 Composite Index and Salomon Brothers Long-term High-grade Corporate Bond Index covering the period 1926-1998. The use of holding period returns over a very long period of time is useful in the beta approach. As Ibbotson Associates'[15] 1999 Yearbook states:

> A long view of capital market history, exemplified by the 73-year period (1926-1998) examined here, uncovers the basic relationships between risk and return among the different asset classes, and between nominal and real (inflation-adjusted) returns. The goal of this study of asset returns is to provide a

[15] Ibbotson Associates, Stocks, Bonds, Bills and Inflation - 1999 Yearbook, pp. 27 and 156.

period long enough to include most or all of the major types of events that investors have experienced and may experience in the future. Such events include war and peace, growth and decline, bull and bear markets, inflation and deflation, as well as less dramatic events that affect asset returns.

By studying the past, one can make inferences about the future. While the actual events that occurred in 1926-1998 will not be repeated, the event-types (not specific events) of that period can be expected to recur. *It is sometimes said that only a few periods are is unusual, such as the crash of 1929-1932 and World War II. This logic is suspicious because all periods are unusual. Two of the most unusual events of the century--the stock market crash of 1987 and the equally remarkable inflation of the 1970s and early 1980s -- took place over the last two decades. From the perspective that historical event-types tend to repeat themselves, a 73-year examination of past capital market returns reveals a great deal about what may be expected in the future.* (italics added)

* * *

Some analysts calculate the expected equity risk premium over a shorter, more recent time period on the basis that more recent events are more likely to be repeated in the near future; furthermore, the 1920s, 1930s and 1940s contain too many unusual events. *This view is suspect because all periods contain "unusual" events.* Some of the most 'unusual' events of this century took place quite recently. These events include the inflation of the late 1970s and early 1980s, the October 1987 stock market crash, the collapse of the high yield bond market, the major contraction and consolidation of the thrift industry, and the collapse of the Soviet Union -- all of which happened in the past 20 years. Without an appreciation of the 1920s and 1930s, no one would believe that such events could happen. More generally, the 73-year period starting with 1926 is representative of what can happen: it includes high and low returns, volatile and quiet markets, war and peace, inflation and deflation, and prosperity and depression. *Restricting attention to a shorter historical period underestimates the amount of change that could occur in a long future period. Finally, because historical event-types (not specific events) tend to repeat themselves, long-run capital market return studies can reveal a great deal about the future. Investors probably expect "unusual" events to occur from time to time and their return expectations reflect this.* (italics added)

In view of the foregoing, it should be clear that random selection of past historical periods such as the past 30 years, would be highly suspect as they

would contain the Vietnam War, the Arab Oil Embargo, the 1987 stock market crash, extraordinary inflation and other significant events as noted by Ibbotson Associates. Thus, the use of arbitrary shorter historical time periods underestimates the amount of change which could occur over a long period in the future. The use of the longer-term past is suitable to evaluate the long-term future because of the presumed long-term investment horizon in common stocks. Consequently, analysis of a long historical period provides useful insight into the future because it is consistent with the long-term investment horizon for utilities' common stocks. The arithmetic mean of those long-term total return rates on the market as a whole is the appropriate mean to use to estimate cost of capital because it provides insight into the volatility (the distribution) of those returns. As Ibbotson Associates[16] states:

> The expected equity risk premium should always be calculated using the arithmetic mean. The arithmetic mean is the rate of return which, when compounded over multiple periods, gives the mean of the probability distribution of ending wealth values....Stated another way, the arithmetic mean is correct because an investment with uncertain returns will have a higher expected ending wealth value than an investment which earns, with certainty, its compound or geometric rate of return every year....*Therefore, in the investment markets, where returns are described by a probability distribution, the arithmetic mean is the measure that accounts for uncertainty, and is the appropriate one for estimating discount rates and the cost of capital.* (italics added)

Historical total returns and equity risk premium spreads differ in size and direction over time. It is precisely for this reason that the arithmetic mean is important. It is the arithmetic mean which provides insight into the variance and standard deviation of returns. It is the prospect for and degree of variance which provides the insight needed by investors to estimate risk when contemplating

[16] Id., at pp. 157-158.

making an investment. Insight into the variance can only be obtained by the use of the arithmetic mean of historical returns. Absent valuable insight into the potential variance of returns, there can be no meaningful evaluation of prospective risk. *If investors relied upon the geometric mean of historical returns, they would have no insight into the potential variance of future returns because the geometric mean relates the change over many periods to a constant rate of change, thereby obviating the year-to-year fluctuations, or variance, critical to risk analysis.*

The basis of the historical market equity risk premium is detailed in Line Nos. 1 through 3, page 6 of Schedule 14.

The basis of the forecasted market equity risk premium is detailed in Line Nos. 4 through 6, page 6 of Schedule 14 and Note 1 on page 4 of Schedule 15 of Exhibit No. 18 (F. Hanley).

The average of the historical and projected market equity risk premiums is 8.0% as shown on Line No. 7, page 6 of Exhibit No. 18 (F. Hanley).

As shown on Line No. 9, page 6 of Schedule 14, application of the proxy group's average beta to the average market equity risk premium of 8.0% yields equity risk premiums of 4.0% relative to the proxy group of four water companies and 4.2% relative to the proxy groups of six Value Line water companies.

Q. Please describe the basis of the equity risk premium of 4.7% applicable to utilities with A rated bonds (Schedule 14, page 5, Line No. 2) which you also used to formulate your determination of equity risk premium to be used in the RPM.

A. For the very reasons described supra from Ibbotson Associates, I also performed an analysis of the long-term historical holding period returns applicable to public

utilities, i.e., the S&P Public Utility Index for the period 1928-1998 inclusive. The long-term average provides a good basis for future expectations as all types of events are included, even "unusual" ones. The analysis is summarized on page 8 of Schedule 14. After adjustment to reflect the equity risk premium applicable to A rated public utility bonds that equity risk premium is 4.7% as shown on Line No. 5, page 8 of Schedule 14.

4. <u>Conclusion of RPM Cost Rates</u>

Q. What is your conclusion of equity risk premium?A. I believe that an average of the beta-derived equity risk premium and that applicable to A rated public utilities provide excellent insight into the premium expected by investors over and above the prospective bond yield of the average proxy group company. The resultant equity risk premiums are 4.4% applicable to the proxy group of four water companies and 4.5% applicable to the six Value Line water companies as shown on Schedule 14, page 1, Line No. 6.

Q. What are the resultant RPM cost rates applicable to each proxy group?

A. As shown on Schedule 14, page 1, at Line No. 7, they are 12.3% applicable to the proxy group of four water companies and 12.4% applicable to the proxy group of six Value Line water companies.

Q. Your RPM cost rates are applicable to the average company in each proxy group whose Moody's bond rating is A2 and S&P bond rating is A+ as shown on page 2 of Schedule 14. Is that correct?

A. Yes.

Q. Is UWW's bond rating the same as the proxy groups'?

A. No. It is within the A category but is slightly lower than the proxy groups, i.e., it is A3 by Moody's and A by S&P as indicated in Note 8 on page 2 of Schedule 14.

Q. In your opinion, if UWID issued its own long-term debt, would it be rated in the A category?

A. No. If rated, it would be much lower in view of its very small size, its unique business risks and lack of liquidity and would surely use the private placement method. I believe the rating (or equivalent rating by institutional investors in the absence of an actual rating by a major rating agency), would be Moody's Baa1 and/or S&P's BBB+.

5. <u>The RPM Does Not Presume a Constant Equity Risk Premium</u>

Q. Some critics of the RPM model claim that its weakness is that it presumes a constant equity risk premium. Is such a claim valid?

A. No. The equity risk premium varies inversely with interest rate changes, although not necessarily in perfect tandem with those changes. This is no different than the "g", or growth component, in the DCF model. In a DCF cost rate calculated today, the absolute result "k", as well as the growth component "g", would invariably be different if calculated again a few weeks or months later. This implies that the "g" does change, although in the application of the standard DCF model, the "g" is presumed to be constant. In that regard, there is no difference between the RPM and DCF models, i.e., both models assume an *expectationally constant* equity risk premium and growth rate, respectively, but in actuality *both* change regularly.

As Morin[17] states with regard to the DCF model:

> It is not necessary that *g* be constant year after year to make the model valid. *The growth rate may vary randomly around some average expected value. Random variations around trend are perfectly acceptable, as long as the mean expected growth is constant*. The growth rate must be 'expectationally constant' to use formal statistical jargon. (italics added)

[17] <u>Id</u>., p. 111.

The foregoing confirms that the RPM is similar to the DCF model in the sense that each assumes an "expectationally constant" risk premium and growth rate, respectively, despite the fact that each varies randomly around its mean. The mean referred to is the arithmetic mean, thereby indirectly confirming that only the arithmetic mean is appropriate to use when estimating the cost of capital as discussed supra.

D. The Capital Asset Pricing Model (CAPM)

1. Theoretical Basis

Q. Please explain the theoretical basis of the CAPM.

A. The CAPM defines risk as the covariability of a security's returns with the market's returns. This covariability is measured by beta ("β"), an index measure of an individual security's variability relative to the market. A beta less than 1.0 indicates lower variability than the market and a beta greater than 1.0 indicates greater variability than the market.

The CAPM assumes that all non-market, or unsystematic, risk can be eliminated through diversification. The risk that cannot be eliminated through diversification is called market, or systematic, risk. The model presumes that investors require compensation for risks that cannot be eliminated through diversification. Systematic risks are caused by socioeconomic and other events that affect the returns on all assets. In essence, the model is applied by adding a risk-free rate of return to a market risk premium. This market risk premium is adjusted proportionally to reflect the systematic risk of the individual security relative to the market as measured by beta.

The **traditional CAPM** is expressed as:

$R_s = R_f + \beta (R_m - R_f)$

Where: R_s = Return rate on the common stock

R_f = Risk-free rate of return

R_m = Return rate on the market as a whole

β = Adjusted beta (volatility of the security relative to the market as a whole)

Numerous tests of the CAPM have confirmed its validity. These tests have measured the extent to which security returns and betas are related as predicted by the CAPM.

The **empirical CAPM (ECAPM)** discussed by Morin reflects the reality that the empirical Security Market Line (SML) described by the CAPM is not as steeply sloped as the predicted SML in the traditional CAPM. Morin[18] states:

> At the empirical level, there have been countless tests of the CAPM to determine to what extent security returns and betas are related in the manner predicted by the CAPM.[19] The results of the tests support the idea that beta is related to security returns, that the risk-return tradeoff is positive, and that the relationship is linear. The contradictory finding is that the empirical Security Market Line (SML) is not as steeply sloped as the predicted SML. With few exceptions, the empirical studies agree that the implied intercept term exceeds the risk-free rate and the slope term is less than predicted by the CAPM. That is, low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted.

* * *

[18] Id., at p. 321.

[19] For a summary of the empirical evidence on the CAPM, see Jensen (1972) and Ross (1978). The major empirical tests of the CAPM were published by Friend and Blume (1975), Black, Jensen, and Scholes (1972), Miller and Scholes (1972), Blume and Friend (1973), Blume and Husic (1973), Fama and Macbeth (1973), Basu (1977), Reinganum (1981B), Litzenberger and Ramaswamy (1979), Banz (1981), Gibbons (1982), Stambaugh (1982), and Shanken (1985). CAPM evidence in the Canadian context is available in Morin (1981).

> Therefore, the empirical evidence suggests that the expected return on a security is related to its risk by the following approximation:
>
> $$K = R_F + x (R_M - R_F) + (1-x) \beta (R_M - R_F)$$
>
> where x is a fraction to be determined empirically. ...the value of x that best explains the observed relationship is between 0.25 and 0.30. If x = 0.25, the equation becomes:
>
> $$K = R_F + 0.25(R_M - R_F) + 0.75\beta(R_M - R_F)$$[20]
>
> * * * * *

I apply both versions which are contained in Exhibit No. 18 (F. Hanley), Schedule 15 which consists of 4 pages.

2. <u>Risk-Free Rate of Return</u>

Q. Please describe your selection of a risk-free rate of return.

A. My applications of the CAPM and the ECAPM reflect a risk-free rate of 6.2%. It is based upon the average consensus forecast of the reporting economists in the December 1, 1999 issue of <u>Blue Chip Financial Forecasts</u> for the yields on 30-year U.S. Treasury bonds for the six quarters ending with the first calendar quarter 2001 as shown in Note 2, Schedule 15, page 4.

Q. Why is the average prospective yield on 30-year U.S. Treasury Bonds appropriate for use as the risk-free rate?

A. The yield on 30-year T-Bonds is almost risk-free and its term is consistent with the long-term cost of capital to public utilities measured by the yields on public utility bonds and more closely matches the long-term investment horizon inherent in utilities' common stocks. Moreover, it is consistent with the long-term investment horizon, which is presumed to be infinite; in the standard DCF model

[20] <u>Id</u>., at pp. 335-336.

employed in proceedings such as these. In addition, Morin[21] states:

> Equity investors generally have an investment horizon far in excess of ninety days. More importantly, the short-term T-bill yields reflect the impact of factors different from those influencing long-term securities, such as common stock. For example, the premium for expected inflation absorbed into 90-day Treasury bills is likely to be far different than the inflationary premium absorbed into long-term securities yields. The yields on long-term Treasury bonds match more closely with common stock returns. *For investors with a long time horizon, a long-term government bond is almost risk-free.* (italics added)

As to the use of T-Bills in the CAPM, Harrington[22] states:

> The most widely used proxies, 30- or 90-day Treasury bill rates are empirically inadequate and theoretically suspect.

In summary, the average expected yield on 30-year Treasury Bonds is the appropriate proxy for the risk-free rate in the CAPM because it is almost risk-free as noted by Morin supra and more closely match the long-term investment horizon implicit in utilities' common stocks as well as with the long-term horizon (infinite) implicit in the standard DCF model.

3. Market Equity Risk Premium

Q. Please explain the basis for your estimation of the expected market equity risk premium.

A. I estimate investors' expected total return rate which is based on an average of forecasted and the long-term historical return rates. The result is an expected market equity risk premium for the market, some proportion of which must be allocated to the proxy group. I make the allocation through the use of beta, a measure of risk related to the market as a whole.

The basis of the projected median market equity risk premium is

[21] Id., at p. 308.

[22] Diana R. Harrington, Modern Portfolio Theory and the Capital Asset Pricing Model - A User's Guide, Prentice-Hall, Inc., 1983, p. 108.

explained in detail in Note 1 on page 4 of Schedule 15. The appreciation projections by Value Line and average dividend yield equate to a forecasted annual total return rate on the market of 16.19%, which rounds to 16.2%. The long-term historical return rate of 13.2% on the market as a whole is from Ibbotson Associates' Stocks, Bonds, Bills and Inflation - 1999 Yearbook. In each instance, the relevant risk-free rate was deducted from the total market return rate. For example, from the Value Line projected total market return of 16.2%, the forecasted average risk-free rate of 6.2% was deducted indicating a forecasted market risk premium of 10.0%. From the Ibbotson Associates' long-term historical total return rate of 13.2%, the long-term historical income return rate on long-term U.S. Government Securities of 5.2% was deducted indicating an historical equity risk premium of 8.0%. Thus, the average of the projected and historical total market risk premiums of 10.0% and 8.0%, respectively, is 9.0%.

4. Conclusion of CAPM Cost Rates

Q. What are the results of your applications of the CAPM and ECAPM?

A. The results are shown on Schedule 15, page 1.

The traditional CAPM cost rates are 10.7% and 11.0% while the ECAPM cost rates are 11.8% and 12.0% relative to the proxy group of four water companies and the proxy group of six Value line companies, respectively. The averages of the traditional CAPM and ECAPM are 11.3% for the group of four water companies and 11.5% for the group of six Value Line companies.

E. The Comparable Earnings Model (CEM)

1. Theoretical Basis

Q. Please describe the theoretical basis of the comparable earnings model (CEM).

A. The comparable earnings standard recognizes the fundamental economic

concept of opportunity cost. This concept states that the cost of using any resource -- land, labor and/or capital -- for a specific purpose is the return that could have been earned in the next best alternative use. The opportunity cost to an investor in a utility's common stock is what that capital would yield in an alternative investment of similar risk. The opportunity cost principle is consistent with one of the fundamental principles of utility price regulation: it is intended to act as a surrogate for competition.

The problem in using returns on book equity (the ROEs) of other companies operating under price competition is determining whether those other companies are similar in risk to the price regulated utility. The ROEs of other similar price regulated firms either should not be relied upon at all or should be used with extreme caution. The returns of other price regulated firms reflect the result of regulatory awards and may not be indicative of what could have been earned in a competitive market. Consequently, application of the CEM is most appropriately implemented by examining the ROEs of similar risk, domestic, non-price regulated firms.

2. <u>Application of the CEM</u>

Q. Please describe your application of the CEM.

A. My CEM analysis is shown in Exhibit No. 18 (F. Hanley), Schedule 16 which consists of 3 pages. Pages 1 and 2 contains the data relating to the proxy groups of four water companies and six Value Line companies, respectively, while page 3 contains the related notes. It is critical to the application of the CEM to select a proxy group of non-price regulated companies similar in total risk to the price regulated utilities. The proxy groups should be broad-based in order to obviate individual company-specific aberrations. Utilities should be eliminated to

avoid circularity since the returns on the book common equity of the utilities are substantially influenced by the rate determinations of their respective regulatory commissions.

2. Selection of Market-Based Companies of Similar Risk

Q. Is your application of the CEM market-based?

A. Yes. My application of the CEM is market-based because the selection of the comparable non-price regulated firms is based upon statistics derived from the market prices paid by investors, i.e., the betas and related statistics used result from regression analyses over the most recent five years as calculated by Value Line. The bases of selection resulted in proxy groups of non-price regulated firms comparable to the price-regulated utilities, (the two proxy groups of water companies) i.e., comparable in total risk, the sum of non-diversifiable market risk and diversifiable company-specific risks. As a result, there are 15 companies comparable in total risk to the proxy group of four water companies and 26 companies comparable in total risk to the proxy group of six Value Line water companies. The criteria used in the selection of the non-price regulated firms comparable to each proxy group of water companies were:

1. They must be domestic, non-price regulated companies, i.e., non-utilities.
2. The rates of return on net worth or partners capital must be less than 20.0% in each of the five years ending 1998 and projected 2002-2004.
3. They must be covered by Value Line Investment Survey.
4. Their unadjusted betas must lie within plus or minus three standard deviations of the average unadjusted beta of the proxy group.

5. The standard errors of the regressions must lie within plus or minus three standard deviations of the average residual standard error of the proxy group.

Betas are a measure of market risk (systematic risk). The standard errors of the regressions (the standard errors of the estimate resulting from the regression equations from which each company's beta was derived by Value Line) were used to measure each firm's company-specific risk (diversifiable unsystematic risk). The standard errors of the regressions measure the extent to which events specific to a company affect its stock price. In essence, companies which have similar betas and similar standard errors of the regressions have similar total investment risk. The betas and standard errors result from regression analyses of market prices which reflect all perceived risks, a concept affirmed by the EMH. Consequently, the use of those regression statistics results in proxy groups of non-price regulated domestic firms which are similar in total investment risk to the proxy groups of water companies.

All of the non-price regulated firms were chosen based on ranges of beta and standard error of the regression. The ranges were based upon the average standard deviations of the beta and the standard errors of the regressions for the proxy groups of water companies. The use of three standard deviations assures capturing 99.73% of the distribution of unadjusted betas and standard errors, thus assuring comparability.

4. <u>Conclusion of CEM Cost Rates</u>

Q. What are your conclusions of CEM cost rate ?

A. The results are shown in Exhibit No. 18 (F. Hanley) on Schedule 16, pages 1 and 2. There are 15 companies comparable in total investment risk to the four water

companies and 26 companies comparable in total risk to the proxy group of six Value Line companies. The average of the historical and projected median ROEs are 13.0% for both proxy groups as shown on pages 1 and 2 of Schedule 16, respectively. They are the rates which I believe are most relevant

.X. CONCLUSION OF COMMON EQUITY COST RATE

A. Conclusion of Common Equity Cost Rate

Must be Based on the Application of Multiple Models

Q. Please summarize why the conclusion of common equity cost rate supra must be based on the application of multiple models.

A. As discussed supra, the EMH and common sense mandate the use of multiple market-based cost of common equity models. All of the models utilized are market-based.

1. The DCF Model utilizes market prices paid by investors.

2. The RPM utilizes the expected market yield on company-specific long-term debt and the equity risk premium is based upon an expectation of the market equity risk premium allocated through the use of a market-oriented beta.

3. The CAPM and ECAPM utilize total market returns, and betas which result from each individual stock's market price movement relative to the market.

3. The CEM is based upon the selection of comparable risk, non-price regulated domestic companies selected through the use of statistics derived from regression analyses of market prices paid by investors.

Investors are aware that all of these cost of common equity models are in use and are also discussed in the financial literature. Therefore, belief in the EMH requires that all of the models be taken into account.

Q. What is your recommended common equity cost rate applicable to UWID?

A. It is 11.30%. It is based on the common equity cost rates of all four models applied to both proxy groups as summarized on Schedule 1, page 2 of Exhibit

No. 18 (F. Hanley). As shown, the average cost rate based on the proxy group of four water companies is 10.9%. As also shown, the average cost rate based on the proxy group of six Value Line companies is 11.4%. As noted supra, UWID is more risky than the average company in each proxy group. UWID's unique business risks and small size increase its common equity risk by a minimum of 17 basis points, or 0.17% because I believe that on a stand-alone basis, its bond rating would be Baa1 (Moody's) and/or BBB+ (S&P). The 0.17% increment is over and above the cost rates applicable to the average company whose Moody's bond rating is A2. Accordingly, the indicated range of common equity cost rate, based on the two proxy groups relative to UWID, is 11.07%-11.57%. I recommend the use of a point estimate of common equity cost rate, namely the midpoint of the range or 11.32%, rounded down to 11.30%.

In view of the foregoing, my recommended common equity cost rate applicable to UWID is 11.30% as summarized on Schedule 1, page 2 and the overall cost of capital is 9.15% as summarized on Schedule 1, page 1.

XI. CHECK ON THE REASONABLENESS OF THE INDICATED OVERALL COST OF CAPITAL OF 9.15% INCLUDING A COMMON EQUITY COST RATE OF 11.30%

Q. What check do you employ to confirm the reasonableness of your recommended common equity cost rate and overall cost of capital?

A. I utilize a test of pretax interest coverage.

Q. Please explain interest coverage, its significance and its relationship to the cost rate of common equity capital.

A. Interest coverage is defined as the number of times annual interest on debt has been earned. It is the relationship between the income available to pay interest

charges and total interest charges. Earnings available for common equity provide the margin by which fixed charges are covered more than one time. Bond investors use coverage as a tool to measure the relative safety of their investment because of the emphasis placed upon interest coverage, especially pretax interest coverage, by the rating agencies.

For example, S&P places emphasis on pretax interest coverage as it levels financial risk differences between enterprises due to the fact that interest is paid on debt before income taxes are paid to the government because the interest on corporate debt is deductible in arriving at taxable income. Also, pretax interest coverage better reflects the availability of cash from operations from which interest charges are paid. The bond rating agencies, and hence investors who are influenced by them, review trends in pretax interest coverage in conjunction with current developments in order to formulate an assessment of the likely future adequacy or inadequacy of protection to bondholders which can affect bond ratings.

Q. Has S&P recently issued new financial ratio “targets” for utilities?

A. Yes. As of June 21, 1999, S&P has consolidated the target ratios using ranges for all utilities. The new targets are based upon 10 different business positions/profiles with “1" being considered lowest risk and “10" being considered highest risk. The explanation of these revised financial targets and the targets themselves are shown on pages 11 and 12, respectively, of Schedule 2. As S&P explains, the different risk levels between types of utilities are taken into account by the business position/profile assigned.

Q. What is the implicit opportunity for UWID to earn pretax interest coverage based on the requested overall cost of capital of 9.15%?

A. As shown on Schedule 1, page 1, the implicit opportunity for pretax coverage of interest expense is 2.90 times.

. Is that a reasonable opportunity level of pretax coverage for UWID?

A. Yes, I believe it is. As shown on Schedule 14, page 2, the average business positions/profiles of the proxy groups are 2.7 and 2.6, respectively, relative to an average S&P bond rating of A+. It is also shown in Note 8 on Schedule 14, page 2, that UWW's business position/profile is 3.0 relative to an A bond rating. As shown on Schedule 2, page 12, an A bond rating with a business position profile of "3" requires a range of pretax interest coverage of from 2.8 to 3.4 times. Moreover, during the five-years ended 1998, the proxy group of four water companies, on average, actually earned pretax interest coverage of 3.28 times while the proxy group of six Value Line companies, on average, actually earned pretax interest coverage of 2.83 times as shown on page 1 of Schedules 4 and 5, respectively.

As discussed previously, I believe that if UWID issued its own debt, its rating or rating equivalent would likely be BBB+ and because of its small size and unique business risk, its business position/profile would be markedly greater (i.e., more risk) than UWW's or those of the proxy groups. Assuming that UWID's business position were "4", the range of pretax interest coverage required would be 2.2 to 3.3 times with a bond rating in the BBB category.

It is clear from the foregoing that the opportunity to earn pretax interest coverage of 2.90 times is reasonable and thereby confirms my recommended common equity cost rate of 11.30% applicable to UWID as reasonable.

Q. Does this conclude your direct testimony?

A. Yes.

Dean J. Miller
Chas. F. McDevitt
McDEVITT & MILLER LLP
537 W. Bannock, Suite 215
P.O. Box 2564-83701
Boise, ID 83702
208.343.7500
208.336.6912 (Fax)

BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE APPLICATION OF UNITED WATER IDAHO INC. FOR APPROVAL OF INCREASED RATES FOR WATER SERVICE	))))	CASE NO. UWI-W-00-1

EXHIBIT TO ACCOMPANY

THE DIRECT TESTIMONY OF

FRANK J. HANLEY

ON BEHALF OF UNITED WATER IDAHO INC.

February 2000