DIVISION 1
COURT OF APPEALS
STATE OF ARIZONA
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IN THE COURT OF APPEALS
STATE OF ARIZONA
DIVISION ONE

CHAPARRAL CITY WATER COMPANY, an Arizona corporation, Appellant, v. ARIZONA CORPORATION COMMISSION, an agency of the State of Arizona, Appellee, and RESIDENTIAL UTILITY CONSUMER OFFICE, Intervenor-Appellee.	1 CA-CC 05-0002 DEPARTMENT B **MEMORANDUM DECISION** (Not for Publication - Rule 28, Arizona Rules of Civil Appellate Procedure)

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Arizona Corporation Commission

Docket No. W-02113A-04-0616

AFFIRMED IN PART; VACATED; REMANDED

Fennemore Craig, P.C. — Phoenix
By Norman D. James
Jay L. Shapiro
Attorneys for Appellant

Arizona Corporation Commission Legal Division — Phoenix
By Janet F. Wagner
Janice M. Alward
Attorneys for Appellee

Residential Utility Consumer Office — Phoenix
By Scott S. Wakefield
Daniel W. Pozefsky
Attorneys for Intervenor-Appellee

W I N T H R O P, Judge

¶1 Chaparral City Water Company ("Chaparral City") appeals from a decision by the Arizona Corporation Commission ("the Commission") on Chaparral City's application for rate adjustments. Chaparral City argues that the Commission did not use the fair value of Chaparral City's assets in determining its rates, as required by Article 15, Section 14, of the Arizona Constitution. Chaparral City also challenges the methodologies adopted by the Commission for determining the cost of equity, which resulted in what Chaparral City contends is an unreasonably low rate of return. For the following reasons, we find that the Commission did not comply with Article 15, Section 14, of the Arizona Constitution when it set Chaparral City's rates based on original cost instead of the fair value of Chaparral City's property. Thus, we vacate the Commission's decision and remand for further determination of Chaparral City's rates consistent with our constitution. However, we also find that Chaparral City has not made a clear and convincing showing that the Commission's decisions regarding the methodologies used to determine the cost of equity were unlawful or unreasonable.

FACTS AND PROCEDURAL HISTORY

¶2 Chaparral City is an Arizona public service corporation that provides water utility service to approximately 12,000 customers in the northeastern Phoenix metropolitan area. On August 24, 2004, Chaparral City filed an application with the Commission requesting an increase in revenues of $1,797,182, or 29 percent, which would produce a rate of return of 8.22 percent on its fair value rate base ("FVRB"). The Residential Utility Consumer Office ("RUCO") was granted the right to intervene.[1]

¶3 A hearing was held over four days between May 31 and June 8, 2005, with both written and oral testimony as well as exhibits being provided by Chaparral City, Commission Staff ("Staff"), and RUCO. The Commission determined that Chaparral City's original cost rate base ("OCRB")[2] and reconstructed cost new ("RCND") rate base[3] for the test year ending December 31, 2003, were $17,030,765 and $23,649,830, respectively. The two amounts were averaged to

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1 RUCO is an organization established by statute to represent the interests of residential utility consumers in regulatory proceedings involving public service corporations before the Commission. Ariz. Rev. Stat. ("A.R.S.") § 40-462(A) (2001). RUCO is statutorily authorized to intervene and participate in proceedings related to rate making and rate design involving public service corporations. A.R.S. § 40-464(A)(2) (Supp. 2006).

2 OCRB is defined as "[a]n amount consisting of the depreciated original cost, prudently invested, of the property (exclusive of contributions and/or advances in aid of construction) at the end of the test year, used or useful, plus a proper allowance for working capital and including all applicable pro forma adjustments." Ariz. Admin. Code ("A.A.C.") R14-2-103(A)(3)(h).

3 The RCND rate base is defined in part as "[a]n amount consisting of the depreciated reconstruction cost new of the property (exclusive of contributions and/or advances in aid of construction) at the end of the test year, used and useful, plus a proper allowance for working capital and including all applicable pro forma adjustments." A.A.C. R14-2-103(A)(3)(n).

determine a FVRB of $20,340,298.[4] The Commission adopted Staff's recommendation of a weighted average cost of capital of 7.6 percent. The Commission then multiplied that rate by the OCRB and divided the product by the FVRB to derive the fair value rate of return of 6.36 percent. The Commission next applied the 6.36 percent fair value rate of return to the FVRB for an operating income of $1,294,338, which represented an increase in revenues of $1,107,596 or 17.86 percent over test year adjusted revenues. The Commission denied a request by Chaparral City to authorize automatic adjustment mechanisms to allow Chaparral City to pass directly through to customers increases and decreases in its costs for purchased water and power.

¶4 The Commission issued its Decision No. 68176 on September 30, 2005. Chaparral City filed an application for rehearing, asserting that the order was contrary to law, arbitrary, and unsupported by the evidence. Chaparral City contended that the Commission did not use Chaparral City's fair value when calculating Chaparral City's operating income and rates and that the return on

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[4] "Fair value" is not defined by the Arizona Constitution. *See, e.g.*, Ariz. Const. art. 15, § 14; *Simms v. Round Valley Light & Power Co.*, 80 Ariz. 145, 151, 294 P.2d 378, 382 (1956). It is generally recognized as being based on both original cost and reproduction cost. Keith M. Howe & Eugene F. Rasmussen, *Public Utility Economics and Finance* 68 (1982); Charles F. Phillips, Jr., *The Regulation of Public Utilities - Theory and Practice* 305 (Public Utilities Reports, Inc., 2d ed. 1988) ("*Fair value* is a figure somewhere between original cost and reproduction cost, arrived at by the exercise of 'enlightened judgment' or by a specific formula.").

common equity found by the Commission, used to determine the weighted average cost of capital, was unreasonably low because the Commission used flawed financial models. The application for rehearing was deemed denied by operation of law. *See* A.R.S. § 40-253(A) (2001). Chaparral City then filed a notice of direct appeal. This court has jurisdiction pursuant to A.R.S. § 40-254.01 (2001).

ANALYSIS

I. Compliance with the Arizona Constitution

¶5 The Arizona Constitution gives the Commission exclusive and plenary authority to prescribe just and reasonable rates to be charged by public service corporations in the state. Ariz. Const. art. 15, § 3; *Tucson Elec. Power Co. v. Ariz. Corp. Comm'n*, 132 Ariz. 240, 242, 645 P.2d 231, 233 (1982). We will affirm an order by the Commission in a rate case unless the party seeking review makes a clear and satisfactory showing that the order is unlawful or unreasonable. *See* A.R.S. § 40-254.01(A), (E). A "clear and satisfactory" showing means a "clear and convincing" showing. *Consol. Water Utils., Ltd. v. Ariz. Corp. Comm'n*, 178 Ariz. 478, 481, 875 P.2d 137, 140 (App. 1993). When considering the Commission's decision in a rate-making context, we look at the evidence only to determine if the decision is unreasonable in that it lacks substantial support in the record, is arbitrary, or is otherwise unlawful. *Simms*, 80 Ariz. at 154-55, 294 P.2d at 384.

We do not reweigh the evidence or substitute our judgment for that of the Commission. *See Tucson Elec.*, 132 Ariz. at 243, 645 P.2d at 234. We review matters of law, however, *de novo*. *U.S. W. Commc'ns, Inc. v. Ariz. Corp. Comm'n*, 201 Ariz. 242, 244, ¶ 7, 34 P.3d 351, 353 (2001).

¶6 Article 15, Section 3, of the Arizona Constitution requires the Commission to "prescribe . . . just and reasonable rates and charges to be made and collected, by public service corporations within the State for service rendered therein." Article 15, Section 14, of the Arizona Constitution provides that the Commission "shall, to aid it in the proper discharge of its duties, ascertain the fair value of the property within the State of every public service corporation doing business therein." These provisions have been interpreted as requiring the Commission to find the "fair value" of the utility's property and to use that finding as a rate base in calculating just and reasonable rates. *Simms*, 80 Ariz. at 151, 294 P.2d at 382. The purpose of the fair value requirement is to provide a fair return on the fair value of the property that a public utility devotes to public use. *Ariz. Corp. Comm'n v. Ariz. Water Co.*, 85 Ariz. 198, 203, 335 P.2d 412, 415 (1959). Although the Arizona Supreme Court has noted that the constitution does not require the Commission to use fair value as the exclusive rate basis, the court nevertheless has reaffirmed that in a monopolistic setting, "where rates [are] determined by giving the utility a reasonable return on its Arizona property, the fair value requirement [is] essential." *U.S. W. Commc'ns*, 201 Ariz. at 245-46, ¶¶ 17-18, 34 P.3d at 354-55. Accordingly, the setting of reasonable rates without regard to fair value does not comply with the constitutional requirement. *Simms*, 80 Ariz. at 151, 294 P.2d at 382. Fair value is measured by the value of a utility's property at the time of inquiry. *Id.*

¶7 In determining rates, the Commission employs the general equation that a utility's revenue requirement equals the sum of its operating income plus its operating (and other) expenses. Chaparral City disagrees with the Commission and RUCO on the method to be used to determine the operating income and asserts that operating income is the product of the FVRB and the rate of return, and that the rate of return is generally equal to a utility's weighted cost of capital.[5] *See generally* Howe & Rasmussen, *supra*, at 99-100; Roger A. Morin, *Utilities' Cost of Capital* 21-22 (Public Utilities Reports, Inc. 1984). The Commission, however, found operating income by multiplying the cost of capital by the OCRB. The Commission then divided the result by the FVRB to obtain what it terms the fair value rate of return. It then multiplied the fair value rate of return by the FVRB to obtain the operating income. Specifically, in this case, the Commission determined the

[5] "[T]he rate of return is the amount of money earned by a public utility, over and above operating costs, expressed as a percentage of the rate base." Phillips, *supra*, at 358. Rates of return vary, depending on the type of rate base used. *Id.* at 366.

weighted cost of capital for Chaparral City to be 7.6 percent. The Commission then multiplied Chaparral City's OCRB of $17,030,765 by 7.6 percent, which equaled $1,294,338. The Commission next divided that number by $20,340,298 -- the agreed-on FVRB -- to obtain the fair value rate of return of 6.36 percent. The Commission then multiplied 6.36 percent by the FVRB of $20,340,298 to obtain an operating income of $1,294,338.

¶8 Chaparral City argues on appeal that the Commission's application of the FVRB is meaningless because the Commission merely divided the operating income by the FVRB and then multiplied the result by the FVRB, arriving at the same number for the operating income. Chaparral City contends that the Commission's use of this method results in rates set based on Chaparral City's OCRB without regard to its FVRB. Consequently, Chaparral City argues, the method violates the Arizona Constitution's requirement that rates be based on the fair value of the utility's property.

¶9 In testimony before the Commission, when asked how FVRB was used to determine revenue requirements, Commission Staff Public Utilities Analyst Alejandro Ramirez stated that the "FVRB was multiplied by the Fair Value Rate." Staff asserted that it considered fair value, and that to ensure Chaparral City could earn a fair rate of return on that fair value, Staff proposed a cost of capital analysis that produced a weighted average cost of capital that, when applied to Chaparral City's OCRB, yielded just and reasonable rates. In its decision, the Commission rejected Chaparral City's contention that the methodology used did not comply with the fair value requirement, determining that the method proposed by Chaparral City would result in "an excessive return on FVRB." The Commission further determined, "There has been no legitimate basis presented for departing from the traditional ratemaking methodology of applying a fair value rate of return to [Chaparral City]'s FVRB in this proceeding."

¶10 On appeal, the Commission recasts Chaparral City's argument as one by which Chaparral City seeks a declaration that the Commission must, as a matter of law, apply the weighted average cost of capital to the FVRB. The Commission contends that such a ruling would intrude on the Commission's plenary ratemaking authority and would prevent the Commission from ensuring that the fair rate of return complies with federal due process standards and the Arizona Constitution's requirement to set just and reasonable rates. Chaparral City, however, does not seek such relief, but asks that the Commission be directed to apply the "authorized rate of return" to the fair value rate base rather than to the OCRB, as Chaparral City contends was done here.

¶11 The Commission argues that the method used in this case has been used by the Commission for many years and that it satisfies the requirements to find fair value and establish a fair value rate of return, to comply with federal due process concerns, and to establish just and reasonable rates. The Commission also contends that the method was cited with approval in *Litchfield Park Service Co. v. Arizona Corp. Commission*, 178 Ariz. 431, 434-35, 874 P.2d 988, 991-92 (App. 1994). Although *Litchfield Park* describes the method used, it does not specifically approve or disapprove of it. Whether the process complied with the constitutional requirement to use fair value to set rates was not an issue in that case.

¶12 Chaparral City argues that two cases -- *Simms* and *Arizona Corp. Commission v. Citizens Utilities Co.*, 120 Ariz. 184, 584 P.2d 1175 (App. 1978) -- express disapproval of the method employed by the Commission. In *Simms*, the Arizona Supreme Court stated as follows:

> The company contends the commission in arriving at just and reasonable rates first determined what the company should be allowed to earn in order to maintain a sound financial position, attract necessary additions to capital and pay a fair return on common equity; and second, having thus established the amount the company should be allowed to earn for such purposes, it proceeded to adjust the rate of return to any rate base. If this be true, it would be an illegal method of establishing a rate base. The standard for establishing a rate base must be the fair value of the property and not what the commission might believe was a fair rate of return on common equity.

80 Ariz. at 155, 294 P.2d at 385. The supreme court in *Simms*, however, could not determine that the Commission had actually employed the method of which the company complained and so sustained the Commission's order. *Id.* at 155-56, 294 P.2d at 385.

In the instant case, the Commission concedes that the method disapproved in *Simms* is the method employed here. In *Citizens Utilities Co.*, this court noted that the analysis urged by an expert witness violated the constitutional principle that a utility was entitled to a fair rate of return on the fair value of its properties. 120 Ariz. at 190 n.5, 584 P.2d at 1181 n.5. The witness tied his opinion as to rate of return to the finding of fair value, resulting in a fluctuating rate of return and a situation in which the amount of money the company received remained the same, regardless of the type of rate base used. *Id.*

¶13 The Commission argues that the disapproval expressed in these cases is dicta and therefore of no precedential value. Although not critical to the outcome in those cases, the comments demonstrate a view that the method is unlawful. Regardless of the precedential value, however, the Arizona Constitution and prior case law compel the conclusion that the method employed by the Commission to determine the operating income in this case did not comport with constitutional requirements.

¶14 Under the Arizona Constitution, a public utility is entitled to a fair return on the fair value of its property devoted to public use. *Ariz. Water Co.*, 85 Ariz. at 203, 335 P.2d at 415. The Commission is required to find the fair value of the utility's property at the time of the inquiry and to use that finding in setting just and reasonable rates. Ariz. Const. art. 15, §§ 3, 14;

U.S. W. Commc'ns, 201 Ariz. at 245-46, ¶¶ 13-19, 34 P.3d at 354-55; *Simms*, 80 Ariz. at 151, 294 P.2d at 382; *Scates v. Ariz. Corp. Comm'n*, 118 Ariz. 531, 533-34, 578 P.2d 612, 614-15 (App. 1978). Here, the Commission determined Chaparral City's operating income based on its OCRB and then mathematically calculated a corresponding rate of return had the income been based on the FVRB. Under this method, Chaparral City's operating income, and therefore its revenue requirements and rates, were based not on the fair value of its property, but on its OCRB, which does not comport with the Arizona Constitution.

¶15 The Commission argues that it has plenary, exclusive authority in ratemaking and so is entitled to deference. This is true. *See Ethington v. Wright*, 66 Ariz. 382, 392, 189 P.2d 209, 216 (1948). However, the Commission's authority is circumscribed by its obligations under the constitution to find and use fair value in setting rates.

¶16 The Commission also argues that use of the method employed here was appropriate given that Chaparral City requested a rate of return based on a cost of capital analysis. The Commission contends that, because the cost of capital analysis is based on Chaparral City's capital structure, it measures the cost of the funds that Chaparral City actually invested in the plant. The Commission argues that applying the weighted average cost of capital as a rate of return to the fair value rate base would be applying a figure based on investment to a rate base figure not based on investment. By this argument, the Commission appears to be advocating the setting of rates based on the investment made in the plant. However, rates cannot be based on investment, but must be based on the fair value of the utility's property. *Simms*, 80 Ariz. at 151, 294 P.2d at 382; *Ariz. Water Co.*, 85 Ariz. at 203, 335 P.2d at 415.

¶17 The Commission also argues that the cost of capital analysis "is geared to concepts of original cost measures of rate base, not fair value measures of rate base" and thus was appropriately applied here to the OCRB.[6] The Commission asserts that it was not bound to use the weighted average cost of capital as the rate of return to be applied to the FVRB. The Commission is correct. If the Commission determines that the cost of capital analysis is not the appropriate methodology to determine the rate of return to be applied to the FVRB, the Commission has the discretion to determine the appropriate methodology. The same is true if the Commission were to determine that applying the weighted average cost of capital to the FVRB resulted in double counting inflation, as argued by RUCO. However, the Commission cannot ignore its constitutional obligation to base rates on a utility's fair value. The Commission cannot determine rates based on the

[6] Cost of capital analysis is appropriate where the rate base used is the OCRB because both are related to the capital structure of the company. *Citizens Tel. Co. v. Pub. Serv. Comm'n*, 247 S.W.2d 510, 513 (Ky. 1952).

original cost, or OCRB, and then engage in a superfluous mathematical exercise to identify the equivalent FVRB rate of return. Such a method is inconsistent with Arizona law.

II. Cost of Equity Estimate Adopted

¶18 Chaparral City also objects to the Commission's adoption of Staff's recommendation for cost of capital.[7] In relation to this argument, Chaparral City asserts that the Commission failed to make adequate findings because in some instances it did not specifically address in detail particular points of dispute. The Commission is required to include in its decisions findings of fact and conclusions of law. A.R.S. § 41-1063 (2004). The findings need not be detailed, however, as long as they are sufficient to permit a reviewing court to discern how the decision was reached. *Shelby Sch. v. Ariz. State Bd. of Educ.*, 192 Ariz. 156, 163, ¶ 21, 962 P.2d 230, 237 (App. 1998). Findings are sufficient if the hearing officer adopts testimony making the findings implicit. *Pinetop Truck & Equip. Supply v. Indus. Comm'n*, 161 Ariz. 105, 107, 776 P.2d 356, 358 (App. 1989).

¶19 Chaparral City argues that the methodologies used by the Commission to determine the weighted cost of capital were flawed. Specifically, Chaparral City argues that the Commission's determination of the common cost of equity was arbitrary and

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[7] We address Chaparral City's argument because it is likely to recur on remand. *See Phelps Dodge Corp. v. Ariz. Elec. Power Coop., Inc.*, 207 Ariz. 95, 108, ¶ 40, 83 P.3d 573, 586 (App. 2004).

capricious, which resulted in an inadequate weighted average cost of capital.

¶20 The weighted cost of capital is the sum of the weighted cost of long-term debt plus the weighted cost of common equity of a company. The weighted cost of long-term debt is determined by multiplying the cost of such debt by the percentage of such debt making up a company's capital structure. Similarly, the weighted cost of common equity is determined by multiplying the cost of such equity by the percentage of such equity making up a company's capital structure. Cost of debt can usually be determined as a fact and generally is not controversial. *Litchfield Park*, 178 Ariz. at 435, 874 P.2d at 992. Cost of equity, however, is more difficult to determine. *Id.*; Morin, *supra*, at 16.

¶21 Cost of equity to a firm is the rate of return that investors expect to earn on their equity investment in the firm, given the risk. The Commission adopted Staff's recommendation of a cost of equity of 9.3 percent. Staff arrived at that number by averaging the results of two models it used to determine the cost of equity -- the discounted cash flow ("DCF") model and the capital asset pricing model ("CAPM"), each of which is a market-based approach.

¶22 Staff, as well as Chaparral City, employed two versions of the DCF model. The constant-growth or one-step model assumes that a company will grow at the same rate indefinitely; the non-constant or two-stage method assumes that investors expect dividends to grow at a non-constant rate in the near term and then at a constant rate in the long term. Under the constant-growth DCF model, the expected annual dividend is divided by the current stock price to produce the dividend yield. The dividend yield is then added to the expected infinite annual growth rate of dividends to produce the cost of equity. The mathematical formula is applied to sample companies that exhibit similar risk to the company whose cost of equity is being estimated. The results are then averaged to obtain an estimated cost of equity for the company in question. Staff used the current market or spot stock price rather than the historical average to calculate the dividend yield. For the dividend growth rate, Staff used a combination of historical and projected dividend-per-share rates provided by *The Value Line Investment Survey*.[8] Staff also considered earnings per share and intrinsic growth in estimating the dividend growth rate.

¶23 For the first stage of the two-stage DCF model, Staff forecasted four years of dividends for each of six sample water utilities using expected dividends over the next twelve months for the first year and the projected dividend-per-share growth rate from *Value Line* for the following years. For the second stage of the two-stage model, Staff used the historical growth rate of the gross domestic product ("GDP") from 1929 to 2003.

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[8] *Value Line* is an investment research company that collects data and tracks, analyzes, and rates investments.

¶24 Chaparral City argues that Staff's use of historic growth rates in its constant-growth DCF model produced inadequate results. Chaparral City based its analysis on a constant-growth DCF model used by the Federal Energy Regulatory Commission, which combined sample dividend yields with forecasted growth estimates and eliminated from consideration any equity cost estimates suggesting the cost of equity is below the cost of investment-grade bonds. Before the Commission, Chaparral City's expert, Dr. Thomas Zepp, contended that no weight should be given to historical growth measures because financial institutions and analysts would take such information into account in making their forecasts.

¶25 Staff's expert, Mr. Ramirez, testified that analysts' forecasts were well known to be optimistic and cited one study showing that *Value Line* analysts gave estimates that exceeded earnings rates by nine percent annually between 1987 and 1989, and another study showing that analysts overestimated the growth of earnings of S&P 500 companies by 188 percent. He testified that exclusive reliance on such forecasts results in inflated cost of equity estimates.

¶26 The Commission agreed with Staff that using only forecasts of growth rates in the water industry might be unreasonable given that analysts' forecasts are known to be optimistic. The Commission concluded that Staff's method of averaging forecasts and past growth rates produces a more reasonable cost of equity estimate. This conclusion is supported in the record by Mr. Ramirez's testimony.

¶27 Chaparral City also argues that the Commission improperly adopted without comment Staff's use of the geometric average annual GDP growth rate as the long-term growth rate in the two-stage DCF model instead of the arithmetic average annual GDP growth rate.

¶28 Before the Commission, Dr. Zepp testified that the geometric average was the correct method to calculate past events, but the arithmetic average was appropriate to estimate growth rates from the past into the future. Mr. Ramirez asserted that the arithmetic mean represents performance over single periods, but the geometric average is concerned with long-term performance. Mr. Ramirez testified that Staff correctly used the geometric average in calculating long-term historic GDP growth.

¶29 The Commission noted disagreement over the appropriate average to use to determine GDP growth. The Commission did not, however, specifically address the matter, other than to state generally that Staff's DCF analysis was based on sound economic principles and provided a more reasonable cost of equity than Chaparral City's. Nevertheless, Mr. Ramirez's testimony supports the Commission's decision. The Arizona Constitution gives the Commission full power to set rates for public utilities. *See* Ariz. Const. art. 15, § 3. It is therefore for the Commission to determine which of the competing methodologies to employ.

¶30 Chaparral City also contends that Staff erroneously used only the projected dividend-per-share growth rate for the first-stage growth in its multistage DCF model, and that doing so depressed the resulting cost of equity. Chaparral City argues that Staff should have included other growth rates, such as the intrinsic growth rate, and, before the Commission, argued that Staff should have also considered growth of earnings per share.

¶31 Mr. Ramirez testified that reliance on forecasts of earnings growth to forecast dividend-per-share growth for the near term would likely result in inflated cost of equity estimates. He further testified that the DCF model is predicated on dividend-per-share growth, and that dividend per share is the relevant factor in the near term if investors expect companies to pay a decreasing portion of earnings.

¶32 The Commission did not specifically address this dispute, but generally approved of Staff's application of the DCF model and adopted Staff's cost of equity estimate. Chaparral City has not presented clear and convincing evidence that the Commission's approval of this method was unlawful or unreasonable.

¶33 Chaparral City also alleges various defects in Staff's application of the CAPM. The CAPM addresses prices of capital assets in a competitive market. It assumes that investors are risk averse -- requiring greater return for a greater risk -- and that they diversify. Under the CAPM, the expected return or cost of equity equals the risk free rate plus the product of "beta" and the market risk premium. "Beta" measures the systematic risk of a company. The market's beta is 1.0, so if a security is riskier than the market, its beta is higher than 1.0, and if the security is less risky than the market, its beta is lower than 1.0. Staff estimated Chaparral City's beta to be 0.68 by averaging the *Value Line* betas of the six sample water utilities. Staff estimated the risk-free rate to be 4.0 percent by averaging the spot rates of three intermediate-term U.S. Treasury securities published in the *Wall Street Journal*. Staff used two approaches to calculate the market risk premium -- the historical market risk premium approach and the current market risk premium approach. To estimate the current risk premium rate, Mr. Ramirez determined the cost of equity using the DCF model. He then applied the CAPM equation to determine the current market risk premium using the market's average beta of 1.0, the yield on a thirty-year treasury note for the risk-free rate, and the cost of equity determined from the DCF model. The CAPM equation was then used to determine the cost of equity for Chaparral City by using Chaparral City's beta and the risk-free rate based on the intermediate-term treasury rates.

¶34 Chaparral City objects to Staff's calculation of beta based on the sample group, arguing that Chaparral City is riskier than the sample utilities, which are larger than Chaparral City and which, unlike Chaparral City, offer publicly traded stock. The

Commission argues that the capital structures of Chaparral City and the average sample water utility are similar and that it is therefore reasonable to assume that they have the same financial risk. The Commission also points out that higher risk is associated with a higher percentage of debt in a company's capital structure and that Chaparral City's percentage of debt is lower than the average debt of the sample utilities. Consequently, Chaparral City has comparably less risk than the average of the sample companies.

¶35 Whether the sample was appropriate to determine beta was within the province of the Commission to decide and, given the conflicting testimony, Chaparral City has not shown by clear and convincing evidence that the Commission's acceptance of the calculated beta was unlawful or unreasonable.

¶36 Chaparral City also argues that the risk-free rate chosen by Staff, and therefore accepted by the Commission, in the CAPM calculation depressed the cost of equity estimate. Mr. Ramirez testified that Staff used intermediate-term treasury securities "based on the theoretical specification that the time to maturity approximates the investor's holding period" and the assumption that "most investors consider the intermediate time frame (5-10 years) a more appropriate investment horizon." Chaparral City contends that the investor's holding period is irrelevant because, regardless of the holding period, a corporation has an indefinite life.

Chaparral City further contends that the use of intermediate-term treasury securities implicitly assumes that the corporation will dissolve after the investor's holding period has ended, making the security worthless. Chaparral City argues that long-term treasury securities, which have a higher interest rate, should have been used instead for the risk-free rate. Chaparral City also argues that Staff improperly used inconsistent interest rates in its current CAPM calculation because Staff used intermediate-term treasury rates as the risk-free rate, but used the long-term treasury rate to estimate the current market risk premium.[9]

¶37 Before the Commission, Mr. Ramirez testified that the CAPM is a holding period model, so the use of long-term treasury securities would not be reasonable because most investors consider five to ten years the appropriate investment "horizon." He further testified that the CAPM is based on the capital market theory, which holds that the horizon is the investors' holding period, not the life of the asset. Mr. Ramirez also criticized Dr. Zepp's advocacy of the use of long-term securities on the grounds that

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[9] The Commission argues that this issue was not raised in Chaparral City's application for rehearing and so cannot be raised on appeal. *See* A.R.S. § 40-253(B), (C) (precluding any claim not raised in an application for rehearing from being raised in court). In its application for rehearing, Chaparral City asserted that Staff inappropriately used one interest rate as its risk-free rate and another to estimate the market risk premium, creating an improper mismatch. Although this assertion was raised in the application for rehearing only as a brief comment, given that the Commission had addressed this objection in its decision, the mention was sufficient to apprise the Commission of the allegation of error.

such securities contained a liquidity premium, which inflated the value of the security. Consequently, Mr. Ramirez testified, the liquidity premium would have to be subtracted before a long-term treasury security could be used as a risk-free rate.

¶38 On appeal, the Commission argues that the evidence presented supports the use of intermediate-term treasury bonds for the risk-free rate. The Commission also argues that using the long-term treasury rate to calculate the market risk premium is justifiable. The Commission contends that the DCF method used determines the present value of all future returns on an asset, which are expected to produce income indefinitely, and the "furthest looking" information available to indicate interest rates for an indefinite period are long-term treasury bonds.

¶39 The Commission's decision acknowledged Chaparral City's objections, including objections to Staff's use of intermediate-term treasury securities for the risk-free rate and Staff's use of inconsistent rates for the risk-free rate and the market risk premium. The Commission's decision does not, however, include any conclusions regarding the CAPM model. The lack of any expressed determination regarding these issues or the CAPM model generally is troubling, but we do not think it fatal to the Commission's decision regarding cost of capital. Staff provided a basis for the Commission's acceptance of its methodology and such decisions are within the purview of the Commission's plenary authority on ratemaking. Chaparral City has not demonstrated by clear and convincing evidence that the decision was unlawful or unreasonable. Moreover, the Commission notes that, even had Staff not performed a CAPM calculation, its recommendation for cost of equity would have been the same based on its DCF analysis, which the Commission found to be based on sound economic principles and to produce a fair and reasonable cost of equity estimate.

¶40 Chaparral City also argues that the Commission ignored theoretical limitations in the CAPM model and should have instead used the California Public Utilities' Commission risk premium method, which was advocated by Chaparral City. Chaparral City cites several authorities expressing the opinion that the CAPM is problematic when used for practical applications. Chaparral City argues that the risk premium method is easier to use than the CAPM because it does not require the choices and assumptions necessary to implement the CAPM, including estimating betas or market risk premiums, but involves comparing authorized and actual returns on equity with the current yield of investment-grade bonds or other debt instruments.

¶41 Mr. Ramirez testified that the risk premium method should not be used because it relies on forecasts of ten-year treasury securities, long-term treasury securities, and Baa corporate bond rates. He argued that the Commission should not rely on forecasts of interest rates because such forecasts are unreliable. Mr.

Ramirez further testified that the best indication of tomorrow's rate is today's rate. He also disagreed with the assumption used by Dr. Zepp in applying the risk premium analysis that accounting returns on equity equal the cost of equity. Mr. Ramirez also noted that one of the three risk premium studies Dr. Zepp performed used returns on equity authorized by regulatory commissions as proxies for the cost of equity. Mr. Ramirez opined that capital markets and not regulatory commissions determine the cost of equity and that returns on equity decided by regulatory commissions could be determined by particular facts in each case, which would make them unreliable.

¶42 The Commission's decision noted Chaparral City's general displeasure with the CAPM, as well as Staff's criticism of Chaparral City's proposed risk premium analysis. The Commission stated that it disagreed with the risk premium analysis for the reasons stated by Staff. Mr. Ramirez's testimony supports the Commission's decision, and Chaparral City has not demonstrated that the Commission's rejection of the risk premium analysis was unlawful or unreasonable.

¶43 Chaparral City also argues that it suffers unique risk from the Commission's imposition of an inverted-tier rate design, intended to promote conservation, and the Commission's rejection of Chaparral City's request for adjustment mechanisms to allow surcharges to cover increased costs for purchased water and purchased power. Chaparral City contends that the Commission should have considered these risks in determining the cost of equity, but instead ignored them.

¶44 Contrary to Chaparral City's contentions, the Commission did address Chaparral City's argument regarding the inverted-tier rate design. The Commission noted Chaparral City's assertion that the design might lead to under-recovery of its authorized rate of return and its claim that the risk should be recognized in determining the return on equity. The Commission found that the risk of revenue instability was sufficiently offset by the growth in Chaparral City's customer base. The Commission found unconvincing Chaparral City's claim that the proposed rate design might cause drastic reductions in water usage such that Chaparral City could not recover its authorized revenue requirement, given that new growth in customer base could compensate for possible reductions in use by existing customers. Chaparral City has not made a clear and convincing showing that this determination was unlawful or unreasonable.

¶45 The Commission rejected Chaparral City's request for automated adjustment mechanisms. The Commission agreed that Chaparral City's purchased water and purchased power expenses were significant, but did not believe that the expenses were at a level of volatility to justify allowing automatic increases in rates without a simultaneous review of costs. The Commission did not specifically address Chaparral City's claim that lacking such a mechanism created a risk that should be taken into account in determining the cost of equity.

¶46 Mr. Ramirez testified that beta represents systematic risk of the industry, which is the only risk relevant to the cost of equity determination. The Commission argues on appeal that Chaparral City did not provide evidence that fluctuations in the cost of purchased power or water were not risks associated with the industry and therefore taken into account by beta. In other words, Chaparral City did not show that the sample companies used to determine beta had adjustment mechanisms. In addition, Mr. Ramirez testified that, because the sample companies carried more debt than Chaparral City, Chaparral City actually had less risk than the sample companies, and so benefited from the calculated beta.

¶47 Although it would have been helpful if the Commission had addressed the risk from the lack of the adjustment mechanism, the record supports the Commission's implicit denial of Chaparral City's request to take the lack of an adjustment mechanism into account in determining the cost of equity.

¶48 In summary, Chaparral City's objections to the methodologies used in determining the cost of equity involve matters of judgment within the province of the Commission. We do not find that Chaparral City has made a clear and convincing showing that the Commission's decisions in these matters were unlawful or unreasonable.

CONCLUSION

¶49 We find that the Commission did not comply with the requirements of Article 15, Section 14, of the Arizona Constitution when the Commission determined the operating income of Chaparral City using the original cost rate base instead of the fair value rate base. We therefore vacate the Commission's decision and remand. However, we also find that Chaparral City has not made a clear and convincing showing that the Commission's decisions regarding the methodologies used to determine cost of equity were unlawful or unreasonable. Accordingly, although we vacate the decision, we affirm the Commission's methodologies used to determine the cost of equity. The matter is remanded to the Commission for further determination.

Lawrence F. Winthrop

LAWRENCE F. WINTHROP, Judge

CONCURRING:

JON W. THOMPSON, Presiding Judge

MAURICE PORTLEY, Judge