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IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF THE UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN, AND TO AMEND DECISION NO. 67744	Docket No. E-01345A-05-0816
IN THE MATTER OF THE INQUIRY INTO THE FREQUENCY OF UNPLANNED OUTAGES DURING 2005 AT PALO VERDE NUCLEAR GENERATING STATION, THE CAUSES OF THE OUTAGES, THE PROCUREMENT OF REPLACEMENT POWER AND THE IMPACT OF THE OUTAGES ON ARIZONA PUBLIC SERVICE COMPANY'S CUSTOMERS.	Docket No. E-01345A-05-0826
IN THE MATTER OF THE AUDIT OF THE FUEL AND PURCHASED POWER PRACTICES AND COSTS OF THE ARIZONA PUBLIC SERVICE COMPANY.	Docket No. E-01345A-05-0827

Arizona Corporation Commission
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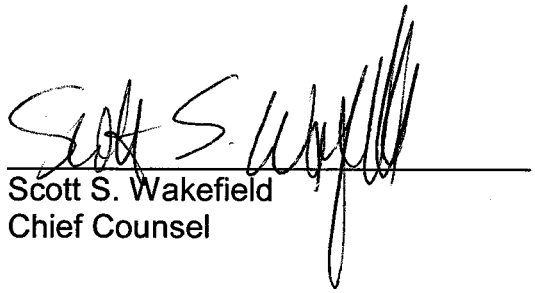
NOTICE OF FILING

The Residential Utility Consumer Office ("RUCO") hereby provides notice of filing the Testimony Summary of Stephen G. Hill in the above-referenced matter.

RESPECTFULLY SUBMITTED this 23rd day of October 2006.



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Commissioner Wong
Arizona Corporation Commission

Eric Grosneger
Aide to Commissioner Wong

By Ernestine Gamble
Ernestine Gamble

SUMMARY OF TESTIMONY
OF
STEPHEN G. HILL

Q. PLEASE STATE YOUR NAME, OCCUPATION AND ADDRESS.

A. My name is Stephen G. Hill. I am self-employed as a financial consultant, and principal of Hill Associates, a consulting firm specializing in financial and economic issues in regulated industries. My business address is P. O. Box 587, Hurricane, West Virginia, 25526 (e-mail:sghill@compuserve.com).

Q. ARE YOU THE SAME STEPHEN HILL WHO TESTIFIED PREVIOUSLY WITH REGARD TO CAPITAL STRUCTURE AND COST OF CAPITAL ISSUES ON BEHALF OF RUCO IN THIS PROCEEDING?

A. Yes, I am.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY AT THIS TIME?

A. The purpose of my testimony is to provide a summary of my Direct and Rebuttal Testimony.

Q. WHAT ARE YOUR RECOMMENDATIONS WITH REGARD TO THE RETURN ON EQUITY CAPITAL AND THE OVERALL RETURN TO BE ALLOWED IN THIS PROCEEDING?

A. I recommend that the company be allowed a return on its equity capital that is equal to its cost. The cost of equity capital for an electric utility operation with similar risks to that of the applicant, Arizona Public Service Company (APS, the Company), currently falls in the range of 9.25% to 9.75%, the mid-point of which is 9.50%. However, because APS has lower financial risk than the sample group of electric utilities, an appropriate return on equity for APS should fall at the lower end of the market-determined cost of equity capital for the sample of publicly-traded electric utility companies. Therefore, I recommended that the Commission set rates for APS so that the Company is allowed the opportunity to earn an 9.25% return on a reasonable level of equity capital investment.

In determining the overall cost of capital, I recommend that the Commission rely on a capital structure consisting of 50% common equity, and 50% long-term debt. Using an appropriate ratemaking capital structure of 50% common equity, 5% preferred stock and 50% long-term debt, and the embedded costs requested by the Company, APS's overall cost of capital will be 7.33%. That level of overall capital costs will afford the Company an opportunity to achieve a pre-tax interest coverage level of 3.85 times. That level of pre-tax interest coverage is substantially above the average level of interest coverage earned by Arizona Public Service over the past three years—2.94x[1]. Therefore, the equity return I recommend allows the Company's electric utility operations a level of interest coverage which exceeds that which it has realized in the past, and thus affords the Company an opportunity to maintain its financial integrity and continue to attract capital, as required by Hope and Bluefield.

SUMMARY OF DIRECT TESTIMONY

Q. PLEASE SUMMARIZE YOUR DIRECT TESTIMONY.

A. My Direct Testimony is organized into five sections. First, I discuss recent research and findings in the field of financial economics regarding the cost of capital as well as other factors that support the reasonableness of single-digit cost of capital estimates. Second, I review the current economic environment in which my equity return recommendation is made and show that current economic indicators support the reasonableness of that recommendation. Third, I recommend a ratemaking capitalization and embedded cost rates for long-term debt appropriate for APS, which balances the interests of its ratepayers and its parent company's stockholders. Fourth, I evaluate the Company's cost of equity capital using a Discounted Cash Flow (DCF) and three other corroborative methodologies: Modified Earnings-Price Ratio (EPR), Market-to-Book Ratio (MTB) and

[1] Arizona Public Service Company 2006 S.E.C. Form 10-Q, March 31, 2006, Exhibit 12.

Capital Asset Pricing Model (CAPM) analyses. Fifth, I address the deficiencies in the Company's equity cost estimation methodologies, showing that the Company's requested equity return is overstated.

Q. PLEASE BRIEFLY DISCUSS EACH SECTION OF YOUR DIRECT TESTIMONY.

A. A brief synopsis of each section of my testimony is provided below:

- **Section I, Investor Expected Returns.** In the initial section of my testimony I provide objective evidence available in the marketplace, as well as recent research in financial economics that indicates that a cost of equity capital in the 9.25% to 9.75% range for electric utilities is reasonable and represents a reasonable approximation of investors' expected return (the cost of equity capital). The evidence presented is as follows:
  - The returns on common equities in the US market included in APS's pension fund projections are well below 10%.
  - Investor services (AG Edwards, Value Line) currently project single-digit returns for utility investments.
  - Utility industry analysts as well as other financial media indicate that equity return expectations are in the 8.5% to 9.5% range.
  - Current academic research related to the expected return on stocks over that of bonds (the risk premium) indicates that single-digit returns are reasonable expectations.
    - Long-term historical studies (Dimson, et al, Siegel) indicate a risk premium above long-term Treasury bonds of 3.4% to 5%, and that expected risk premiums are likely to be lower than those experienced historically.
    - Forward-looking studies, i.e., studies that are based on either a historical analysis of forward-looking returns or of surveys of

risk premium expectations (Fama and French, and Graham and Harvey) show expected equity returns to be only 2.5% to 4.5% above long-term T-bonds.

- Even at the upper end of an expected risk premium range, 5%, given a current T-Bond yield of about 5%, the recent research cited in my testimony indicates an investor-expected return on the stock market, generally, of about 10% [5% T-Bond yield + 5% risk premium]. Because utilities have less investment risk than stocks, these data indicate that my 9.25% equity return for APS is reasonable.

• **Section II, Economic Environment.** In this section of my testimony I provide evidence available in the marketplace, which indicates that a cost of equity capital in the 9.25% to 9.75% range for electric utilities is reasonable and represents a fair return to investors.

First, the general level of capital costs remains near a 40-year low, as evidenced by current interest rate levels. Although the Federal Reserve has pushed up short-term rates to slow down the economy and ward off inflation, long-term rates (most closely related to the cost of equity) have remained relatively steady over the past two years. Second, Value Line's economic forecasts expect the economy to expand moderately, inflation to remain in check, and supporting the continuation of moderate capital costs. Also, as the economy has slowed recently, long-term rates have declined (as I note in my Surrebuttal Testimony). Third, long-standing and widely-understood relationships between utility market price, book value and expected equity return indicate that equity returns below 10% are reasonable. In sum, the objective evidence available to investors in the capital marketplace today confirms the reasonableness of the 9.25% to 9.75% range of equity capital costs for electric utilities presented in this testimony.

• **Section III, Capital Structure.** The manner in which the Company has been capitalized historically is very different from the capital structure requested by the

1 Company in this proceeding. According to the Company's 2004 S.E.C. Form 10-K,
2 Arizona Public Service Company was capitalized at year-end 2003 and 2004 with an
3 average capital structure that consisted of approximately 45% common equity and 55%
4 long-term debt.[2] During the time that APS was capitalized with a 45% common equity
5 ratio, it maintained investment-grade bond ratings.[3] The Company has maintained an
6 investment-grade bond rating with a 45% common equity ratio and, now, requests that
7 rates be set using a much more expensive capital structure containing about 55%
8 common equity. That increase in common equity, alone, if included in rates would cost
9 Arizona ratepayers $58 Million annually.

10 The current common equity ratio will not be sustained. In its Filing Schedule D-1,
11 APS indicates that by year-end 2007, its common equity ratio will decline by almost
12 three percentage points from the currently requested level. Those data indicate that
13 following the rate case, the Company's common equity ratio will trend downward from
14 its currently elevated levels. Also, the Company's riskier parent, Pinnacle West Capital
15 Corporation is capitalized with approximately 50% common equity in its capital
16 structure. Therefore, an appropriate ratemaking common equity ratio for its regulated
17 subsidiary, APS, should not be higher than that utilized by the unregulated parent
18 company. To do so would be to allow financial cross-subsidization of the parent by the
19 regulated subsidiary.

20 Finally, the 50% equity, 50% debt capital structure I recommend contains
21 considerably more common equity than that utilized on average by the electric utility
22 industry, 44%. Therefore, I recommend that the Commission set rates for APS using a
23 capital structure consisting of 50% common equity and 50% long-term debt.

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[2] Pinnacle West 2004 S.E.C. Form 10-K, p. 131. December 31, 2003 capital structure: 45.66% common equity, 54.34% long-term debt. December 31, 2004 capital structure: 45.09% common equity and 54.91% long-term debt.

[3] S.E.C. Form 10-K, 2003, 2004, 2005.

• **Section IV, Methods of Equity Cost Evaluation.** In this section of my Direct Testimony, I describe in detail the DCF analysis I perform using the market data of a sample of electric utility companies. A sample of electric distributors was chosen as a basis for determining the cost of equity capital because those companies were generally similar in risk to Southwest. In addition, I describe the theory and the mechanics of three other cost of equity estimation techniques I use to corroborate my DCF results—the Modified Earnings-Price Ratio Analysis, the Market-to-Book Ratio Analysis and the Capital Asset Pricing Model Analysis. The results of those analyses are as shown in the Table below:

METHOD	Electric Utility Companies
DCF	9.44%
CAPM	9.23%/10.56%
MEPR	9.13%/8.79%
MTB	9.31%/9.38%

My estimate of the cost of equity capital for the electric utilities included in the sample group, presented in my Direct Testimony, ranges from 9.25% to 9.75%, with a mid-point of 9.25%.

In the conclusion of the third section of my Direct Testimony, I discuss the fact that the ratemaking equity ratio of APS is higher than the sample of electric utilities I studied in my equity cost analysis. Using accepted methods to quantify the cost of equity impact of that financial risk difference indicates that, with a 50% common equity ratio, APS's cost of equity would be approximately 50 basis points below that of the sample group. Therefore, a reasonable return on common equity for Southwest would fall at the lower end of a reasonable range—9.25%. I also provide several reasons why it is not

appropriate to make an explicit adjustment to the cost of equity capital to account for issuance expenses related to sales of new common equity by the Company.

• **Section V, Company Cost of Capital Analysis.** In the final section of my Direct Testimony, I discuss the practical and theoretical deficiencies contained in of the cost of capital testimony of Dr. William Avera, the Company's cost of capital witness. APS witness Avera utilizes DCF, Capital Asset Pricing Model, Risk Premium and Comparable Earnings analyses to estimate the equity capital cost of the Company. Company witness Avera recommends an 11.5% return on equity for APS based on his analysis, which was undertaken about a year ago.

Dr. Avera devotes a portion of his testimony to the "reliability" of DCF cost of equity estimates. The DCF is now, and has for over thirty years, been the pre-eminent equity cost estimation methodology used in regulation for a very simple reason—it works, and it works well. This Commission has, as have most others in the U.S., traditionally relied on the DCF to determine the cost of equity in rate proceedings and should not be dissuaded from doing so on the basis of Dr. Avera's testimony in this proceeding.

Many of the firms used in Dr. Avera's sample group have substantial unregulated operations. Unregulated operations are generally riskier operations than utility operations. Therefore, reliance on the market-based cost of equity of firms that have substantial unregulated operations, such as those included in Dr. Avera's sample group, will lead to a cost of equity estimate that overstates the cost of equity for a utility like APS—even if the equity cost estimation methods are accurate.

Dr. Avera's DCF equity cost estimate produced a result of 9.0%. As I show in my Direct Testimony, updating his DCF analysis produces an equity cost estimate ranging from 8.8% to 9.8%, with a mid-point of 9.53%. My DCF equity cost estimate in this

proceeding is 9.44%. An update of Dr. Avera's DCF methodology tends to confirm my own equity cost estimate in this proceeding.[4]

Dr. Avera used three different types of risk premium analyses to estimate the cost of equity capital. In each of those analyses he adds a risk premium to current bond yields and projected bond yields. However, only the current bond yield provides an estimate of the current cost of equity capital. Relying on projected bond yields in a risk premium analysis to estimate the current cost of equity would be like relying on projected stock prices in a DCF analysis—a procedure Dr. Avera does not recommend.

While Dr. Avera elects, in this proceeding, to place primary emphasis on risk premium results, he has testified previously that it would not be advisable for regulatory bodies to place such heavy reliance on risk premium equity cost estimates.

Dr. Avera's first risk premium analysis, shown in his WEA-5, measures the difference between the return on utility stocks and utility bonds. That analysis also underscores one of the main problems with risk premium methods—the volatility inherent in the historical data indicate that the determination of the historical period effectively determines the outcome of the analysis. As shown on page 62 of my Direct, the historical risk premium shown in Dr. Avera's data declines dramatically from the 4% risk premium he reports as the study period approaches more current data. Since 1966, the return differential between utility stocks and bonds has averaged about only 1%.

In my direct Testimony (Appendix D) in this proceeding, I discussed in detail the shortcomings of the CAPM analysis when used in cost of equity analysis as rationale for reliance on that equity cost estimation methodology as a corroborative method rather than a primary indicator of equity costs in regulatory proceeding. Therefore, I did not revisit all of those issues in detail in the discussion of Dr. Avera's CAPM analysis.

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[4] It is important to note that Dr. Avera did not update his DCF equity cost estimate when he filed Rebuttal Testimony in this proceeding, and elected not to discuss the update of his DCF contained in my Direct Testimony.

The primary flaw in Dr. Avera's CAPM analyses is the risk premium. Dr. Avera utilized two different CAPM methods. His 7.2% market risk premium is based on the historical Ibbotson data base and his 9.0% risk premium is based on a projected equity return for the S&P 500. Both of those estimates are well above the current forward-looking risk premium, as evidenced in the Company's own pension fund equity return expectations as well as the preponderance of the current research on the topic in the academic financial community, which I cite in Section I of my Direct Testimony. Even Ibbotson's projected market risk premium 4% - 6%, which is on the high end of the current consensus, is well below the market risk premiums used by Dr. Avera in his testimony.

The final risk premium analysis used by Dr. Avera is based on allowed returns by other regulatory bodies to other utility operations, in combination with what Dr. Avera perceives to be an inverse relationship between interest rates and risk premiums. I show in my testimony that there is other research on the subject of the relationship between interest rates and risk premiums, not mentioned by Dr. Avera, which indicates that, if there is an inverse relationship between interest rates and the market risk premium, the impact on the current cost of equity capital is much smaller than that postulated by Dr. Avera. Also there is other, more current research by prominent scholars, that indicates the opposite relationship holds. That is, risk premiums are positively related to interest rates, and the lower the interest rates, the lower the risk premium expectation. Finally, data from Dr. Avera's historical allowed return series tends to support that more recent academic finding, namely that risk premiums over the past thirty years, have declined at more rapid rate than have interest rates.

In summary, Dr. Avera's risk premium analyses do not provide information that would be useful to this Commission in its task of determining the cost of equity capital for Arizona Public Service Company's electric utility operations.

SURREBUTTAL TESTIMONY

Q. PLEASE SUMMARIZE YOUR SURREBUTTAL TESTIMONY.

A. In my Surrebuttal Testimony I respond to issues raised by Company witnesses Brandt and Avera in their Rebuttal to my Direct Testimony. I also briefly discuss the testimony of Staff witness Parcell and Investor witness Cannell.

The issues raised in the Company's rebuttal testimony include the impact of RUCO's recommendations on APS's bond rating/risk position, the use of a 50% common equity ratio for ratemaking purposes, Dr. Avera's discussion related to the accuracy and theoretical soundness of my analytical techniques. In responding to Dr. Avera's testimony, I point out that the Company witness' analyses produce results which overstate the Company's actual cost of capital.

Q. PLEASE BRIEFLY SUMMARIZE THE ISSUES RAISED IN YOUR SURREBUTTAL TESTIMONY.

A. I initially respond to Mr. Brandt's concerns regarding my overall return recommendation in this proceeding. Mr. Brandt claims in rebuttal that RUCO did not assess the impact of its overall return recommendation on APS in this proceeding. However, that is not the case. I noted that my recommended return, if earned, would afford the Company an opportunity to achieve a pre-tax coverage of its interest expense that is substantially greater than its has achieved on average over the past three years.

I also discuss Mr. Brandt's income statement projections that are used to create the "RUCO projection" included in his rebuttal exhibit, Attachment DEB-3RB. Those projections incorporate significantly more debt capital than the 50% equity, 50% debt capital structure RUCO recommends in this proceeding. Therefore, his projections are not in line with RUCO's actual recommendations in this proceeding and do not accurately represent the outcome of those recommendations.

I also discuss the fact that it is not unusual during a construction phase for a utility to earn a return that is lower than the return allowed, but that difference will be eliminated when the balance between the utility plant and the number of customer is restored. That re-balancing will occur either through another rate proceeding, or some other recognition of the additional rate base in rates, or through the number of customers increasing more rapidly than the rate base additions. Additionally, I note that while it is reasonable to consider administrative solutions to the difference between test year and actual rate base, it is not reasonable to simply "throw money" at the problem through the use of an attrition allowance, i.e., purposely allowing the company to earn a return greater than its cost of capital. That would not solve any of the regulatory/administrative problems and would be unfair to ratepayers.

Mr. Brandt, in his Rebuttal, also discusses my recommended ratemaking capital structure for APS. In response to Mr. Brandt' capital structure rebuttal, I note that capital

structures are not static and just because the Company has a 55% common equity ratio at one point in time does not mean that its will continue to be capitalized in that manner during its construction period. The Company projects that it's common equity ratio will decline substantially by 2007. Also the shift from 45% equity to 55% equity in APS's capital structure occurred immediately prior to the filing of this rate case and the current equity ratio is unrepresentative of the manner in which APS has been capitalized in the past. Finally, the use of a hypothetical ratemaking capital structure, which balances the interests of ratepayers and investors, has recently been accepted by this Commission as a reasonable ratemaking strategy (Docket No. G-01551A-04-0876).

Mr. Brandt also claims in rebuttal that the capital structure of Pinnacle West is irrelevant because the unregulated operations of Pinnacle West are small relative to APS and, therefore, the parent and the regulated subsidiary have similar business risk. My response to that logic is that, in outlining this position, Mr. Brandt is simply providing additional rationale to use a capital structure similar to that of Pinnacle West (50% equity/50% debt) to set rates for APS. Similar risk companies should be capitalized similarly.

Q. BOTH MR. BRANDT AND DR. AVERA ADDRESS THE ISSUE OF APS'S PENSION FUND SINGLE-DIGIT EQUITY RETURN EXPECTATIONS . HOW DO YOU RESPOND TO THAT ISSUE IN YOUR SURREBUTTAL?

A. First, Mr. Brandt fails to respond directly to the issue raised in my Direct Testimony, namely that the Company's portfolio investment manager projects an equity return expectation well below 10%. Instead, he focuses on what the Company uses to determine its current portfolio return expectations, which, although derived from the lower investment manager projections, includes an additional return attributable to the ability to "beat the market." My reference was to the market return expectation, which shows my recommended 9.25% return for a utility operation to be reasonable.

Second, even if we assume that Mr. Brandt is correct and all equity investors expect the market to earn a 10.5% return (Mr. Brandt's Attachment DEB-15RB), that implies that Dr. Avera's 11.5% return for APS is substantially overstated and a 9.25% for a lower-risk utility is a more reasonable expectation.

Third, Dr. Avera indicates that the Company's portfolio equity return expectation is somehow different from the investor-expected return we seek to determine in cost of capital analysis. That is not a reasonable claim and Dr. Avera has provided no support for his position that the cost of capital in the general equity market is fundamentally different from what investors like APS's pension fund expect.

Fourth, Dr. Avera cites a portion of one footnote in the portfolio investment advisors' report that I cite and attempts to confuse the issue by citing it. However, an examination of the data and the entire report indicate that his "concerns" regarding the treatment of the historical data are misplaced because APS's investment manager makes it quite clear that its equity return expectations are based on many factors in addition to the actual historical earned returns.

In summary, the equity returns included in the Company's retirement portfolio are directly related to investors' expected returns and the cost of equity capital. Moreover, they show that RUCO's equity return recommendation in this proceeding, 9.25%, is reasonable, and Dr. Avera's equity cost estimate, 11.5% is substantially overstated.

Q. WHAT IS YOUR SURREBUTTAL RESPONSE TO DR. AVERA'S REBUTTAL?

Initially, I respond to Dr. Avera's claims that I have selectively cited evidence regarding the expectation for relatively low market risk premiums. However, in the recent research on the market risk premium, there are <u>no</u> serious academic studies that show that the historical Ibbotson risk premium data is understated. The recent research shows that the historical Ibbotson data (the lowest of Dr. Avera's risk premiums) substantially overstates the current expectation in the marketplace.

Dr. Avera cites a study by Mehra, which he believes supports his position. However, as I explain in my Surrebuttal, that paper cited by Dr. Avera examines a different field of study altogether, and does not support his rebuttal thesis. In addition, Dr. Avera incorrectly uses data from the article to create a false market return approximating 14% in an attempt to support his equity return recommendation. However, assuming that the historical return difference between stocks and bonds is an accurate representation of investors' current expectations[5], an appropriate application of the data in the Mehra article indicates a market return expectation of 10.4%. That accurate representation of the Mehra data again shows that Dr. Avera's 11.5% for an electric utility substantially overstates the return expected on the equity market in general, while RUCO's 9.25% recommendation is more reasonable for a lower-risk utility operation.

Dr. Avera, in rebuttal, makes reference to a multi-stage DCF analysis that was used recently by an A.C.C. Staff witness in a water utility rate proceeding and uses that method to derive a DCF result much higher than the DCF he presents in his own testimony. I show that the key assumption in that analysis, i.e., that long-term utility growth will equity GDP growth, is not a reasonable assumption. I provide historical evidence which shows that average utility growth is about half of GDP. Using that relationship, (long-term utility growth = 1/2 long-term GDP growth), the multi-stage DCF adopted by Dr. Avera in rebuttal, produces a DCF result of 8.0% for APS.

I also address Dr. Avera's concerns related to my reliance on market-to-book ratios and expected book equity returns, as well as the corroborative equity cost estimation methods I utilize, as indicators of the cost of equity capital, showing through simple examples that those concerns are without merit. With regard to the corroborative methods I utilize, I note in my Surrebuttal that Dr. Avera has failed to provide any

[5] Most of the current research indicates that current market risk premium expectations are below historical averages.

theoretical rationale as to why those methods should not be used as support for and to temper a DCF equity cost estimate.

In sum, Dr. Avera's equity cost estimate, 11.5%, is fundamentally flawed, relies far too heavily on risk premium analyses (which he, himself, has advised regulators to avoid) and substantially overstates the cost of equity capital of the electric utility operations of Arizona Public Service.

Q. DOES THIS CONCLUDE THE SUMMARY OF YOUR DIRECT AND SURREBUTTAL TESTIMONIES?

A. Yes, it does.