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ORIGINAL

July 21, 2014

Re: Surrebuttal Testimony of Ezra D. Hausman on Behalf of Sierra Club - Arizona Corporation Commission Docket Number E-01345A-11-0224

To Whom It May Concern:

Please find enclosed an original and thirteen (13) copies of the Surrebuttal Testimony of Ezra D. Hausman on Behalf of Sierra Club. A courtesy copy of this filing is also being served on parties via e-mail.

Please let me know if you have any questions.

Sincerely,

/s/ Derek Nelson

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BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS
BOB STUMP, Chairman
GARY PIERCE
BRENDA BURNS
ROBERT L. BURNS
SUSAN BITTER SMITH

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	DOCKET NO. E-01345A-11-0224 **NOTICE OF FILING TESTIMONY OF SIERRA CLUB**

Sierra Club, through its undersigned counsel, hereby provides notice that it has this day filed the written surrebuttal testimony of Ezra D. Hausman in connection with the above-captioned matter.

//

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DATED this 21st day of July, 2014.

/s/ Nellis Kennedy-Howard

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ORIGINAL and 13 COPIES of the foregoing filed this 21st day of July, 2014, with:

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Arizona Corporation Commission
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COPIES of the foregoing served via first class mail this 21st day of July, 2014, to:

All Parties of Record

/s/ Nellis Kennedy-Howard

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SURREBUTTAL TESTIMONY OF EZRA D. HAUSMAN, PH.D.

On Behalf of the Sierra Club

July 21, 2014

Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS.

A. My name is Ezra D. Hausman, Ph.D. I am an independent consultant doing business as Ezra Hausman Consulting, operating from offices at 77 Kaposia Street, Auburndale, Massachusetts 02466.

Q. HAVE YOU PREVIOUSLY FILED TESTIMONY IN THIS DOCKET?

A. Yes. I filed direct testimony on behalf of intervener Sierra Club.

Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?

A. I am addressing certain statements made by APS Witness James C. Wilde in his rebuttal testimony in this Docket. Overall, I demonstrate that Mr. Wilde provides little to no foundation for his criticisms of my direct testimony, and that APS continues to obfuscate and withhold critical details of its NPV analysis of the Four Corners acquisition. APS is asking ratepayers to shoulder a great deal of cost and risk for its acquisition; the company bears the burden of transparently demonstrating that its actions are prudent and in ratepayers' interest. I do not believe that the Commission can reasonably grant the company's petition based on the opaque and limited analysis the company has presented.

Q. IN MR. WILDE'S REBUTTAL TESTIMONY, HE CLAIMS THAT APS'S GAS PRICE FORECASTS AS APPLIED IN THIS DOCKET ARE REASONABLE, OR EVEN CONSERVATIVE. DO YOU AGREE?

A. I have no basis on which to agree or disagree, as the company has not provided sufficient detail for me, the Commission, or anyone else to evaluate its approach in this area.

In my direct testimony, I described numerous reasons why the changes in APS's gas price forecasts, relative to those used in Docket No. E-01345A-10-0474, seemed illogical. Mr. Wilde has not addressed these points; he has provided a vague description of how the company's gas price forecasts were developed, saying that they "are *based on* the New York Mercantile Exchange ("NYMEX") forward market gas prices on September 30, 2013" (2 at 12, emphasis added) and that they are then escalated at a fixed rate after 2025. Mr. Wilde does not explain how he uses the NYMEX data, nor does he provide example calculations or anything else that could provide clarity as to the company's approach.

It must be noted that NYMEX forward market data beyond a very short time horizon hold little value, because they are based on at most a very small number of trades, and often on no trades at all. Further, I have not seen any NYMEX data that extend as far as Mr. Wilde suggests. If the company did

indeed base its forecasts on this source, it should be more forthcoming in its approach and in explaining why such an approach would be valid.

Q. SIERRA CLUB DATA REQUEST 4.1 REQUESTED THE SEPTEMBER 30, 2013 NYMEX FORWARD NATURAL GAS PRICES REFERENCED BY MR. WILDE, ALONG WITH WORKPAPERS SHOWING THE COMPANY'S CALCULATIONS. DID THE COMPANY RESPOND TO THIS REQUEST?

A. Yes. However, the company's response failed to add clarity. APS's written response referred to "NYMEX" data in quotes, implying perhaps that the company uses this name but hedging on the actual source. The worksheet containing the data identifies an entity called "DataMart" as its source. I am unfamiliar with this entity, nor could I find any information about it through an internet search. The data provided do not look like raw NYMEX data, nor do they include important information, such as trade volume or open interest, that would support assessment of the reliability of the numbers.

Sierra Club's intention in making Data Request 4.1 was to provide me with an opportunity to review the nature and quality of the underlying data used by the company in developing its natural gas price forecast, so that I could further investigate the anomalous forecast characteristics identified in my direct testimony. The response provided by the company has not been illuminating or helpful in this regard.

Q. HAVE YOU REVIEWED NYMEX NATURAL GAS FORWARD PRICE DATA AS OF SEPTEMBER 30, 2013?

A. Yes, I purchased the historic Henry Hub futures prices as of the month of September 2013 from CME DataMine.[1] (CME owns NYMEX, and provides a data archiving service for NYMEX and other data.) Again, I cannot compare these directly to APS's price data because the company has not provided sufficient detail for a full understanding of how its prices were derived. However, I note that the volume of trades recorded for September 30 drops precipitously in the near future: Specifically, there are approximately 150,000 trades for the duration of 2013; 75,000 for all of 2014, 1,360 for 2015, 66 for 2016, about 25 for each of 2017 and 2018, and none at all thereafter. The data for all of September show a similar pattern. This absence of trading activity renders the data meaningless as long-term predictors of market prices.

[1] Historic futures data are available for purchase or subscription through CME Group's DataMine service (http://www.cmegroup.com/market-data/datamine-historical-data/)

Q. ON PAGE 2 OF HIS REBUTTAL TESTIMONY, MR. WILDE PROVIDES A QUOTE FROM STAFF WITNESS MR. JAMES LETZELTER STATING THAT THE COMPANY'S GAS PRICES ARE "REASONABLE". TO YOUR KNOWLEDGE, HAS MR. LETZELTER ADDRESSED YOUR CONCERNS REGARDING THE COMPANY'S GAS PRICE FORECASTS?

A. No. In fact, Mr. Letzelter has not addressed either the company's approach or the concerns I raise regarding anomalous features in the company's gas price forecasting history. He merely compares the company's forecasts to "Liberty's view of gas prices" and concludes that they are reasonable based on the numbers alone. In my opinion, the endorsement of another consulting witness in this case is no substitute for the company being forthcoming with the details of its own analysis in this important area.

Q. MR. WILDE GOES ON TO DEFEND THE COMPANY'S CO_2 EMISSIONS PRICE FORECAST. DO YOU FIND HIS EXPLANATION SATISFACTORY?

A. No. Similarly to the gas price forecasts, Mr. Wilde provides only a vague description of how the CO_2 emissions prices were derived. According to Mr. Wilde, "APS reviewed carbon markets trading in California as well as in the East and incorporated projected carbon costs *based on* the actual trading price of CO_2 allowances in the California market as of September 24, 2013."

(4 at 10-13, emphasis added) Again the words "based on" suggest that the company did some interpretive analysis to come up with its numbers.

Q. SIERRA CLUB DATA REQUEST 4.2 REQUESTED THE SEPTEMBER 24, 2013 CO_2 EMISSIONS ALLOWANCE TRADING PRICE DATA REFERENCED BY MR. WILDE, ALONG WITH WORKPAPERS SHOWING THE COMPANY'S CALCULATIONS. DID THE COMPANY RESPOND TO THIS REQUEST?

A. Yes. The company's response is as follows:

> The projected CO2 emission costs are based on the September 24, 2013 NYSE Intercontinental (ICE) California Carbon Allowance Vintage 2016 Futures trade of $11.6/metric ton, escalated at 2.5% per year until 2021, (which is when APS assumed this cost would impact Four Corners). That 2021 cost of $13/metric ton continues to escalate at 2.5% per year through the end of the study period. Also see APS's response to Sierra Club 2.1. (APS response to Sierra Club data request 4.2. The referenced response to Sierra Club 2.1 contains the company's annual emissions price projections without explanation.)

In other words, the company's entire CO_2 emissions price trajectory is based upon extrapolation of a single California carbon allowance trade for 2016, extrapolated throughout the analysis period at something close to the anticipated rate of inflation. In my judgment, this is at best a very tenuous relationship between the company's forecasts and actual trading data, and does not lend credibility to the company's numbers.

Q. HAS MR. WILDE RECONCILED THE COMPANY'S REPRESENTATION OF CARBON EMISSIONS PRICES WITH RECENTLY ANNOUNCED REGULATIONS FROM THE US ENVIRONMENTAL PROTECTION AGENCY?

A. No. To the contrary, Mr. Wilde uses the fact that EPA has announced stringent limitations on greenhouse gas emissions from existing power plants to argue that this issue could be reasonably ignored. Specifically, he states that:

> It is noteworthy that the Clean Power Plan does not propose a carbon market as one of its building blocks for reducing carbon intensity. In light of this, it appears that using any carbon price in the Four Corners analysis may yield a conservatively low estimate of the value of the Transaction. (4 at 22-26)

Q. DO YOU AGREE THAT USING ANY CARBON PRICE FOR THIS ANALYSIS IS "CONSERVATIVE"?

A. I do not. EPA did not mandate a specific carbon market because it does not have authority to do so; however, it is widely accepted in the industry and among economists that requiring limitations on CO_2 emissions from existing plants is tantamount to imposing a cost on emissions, because it creates a scarcity for a good (the right to emit CO_2) that was previously available in unlimited quantities for free. This reality has been recognized throughout the industry and is manifest in the fact that numerous coal-fired plants are likely to curtail operations or shut down altogether in order to comply. To claim as

Mr. Wilde does that the existence of regulations to curtail emissions means they have no value simply defies logic.

Q. AS NOTED ABOVE, MR. WILDE CITED STAFF WITNESS JAMES LETZELTER'S OPINION ON GAS PRICES AS EVIDENCE THAT THE COMPANY'S PRICES ARE "REASONABLE". DID MR. LETZELTER ALSO ADDRESS THE COMPANY'S CO_2 PRICE FORECASTS?

A. Yes. Directly following his discussion of gas price forecasts, Mr. Letzelter compares the company's CO_2 emissions prices to those provided by the U.S. Energy Information Administration (EIA).

Q. WHAT DID MR. LETZELTER CONCLUDE REGARDING THE COMPANY'S CO_2 PRICE FORECASTS AND THEIR IMPACT ON THE NPV ANALYSIS?

A. Mr. Letzelter's conclusions are as follows:

> Based on this comparison to the EIA's projections, Liberty considers the APS numbers to be insufficiently conservative (*ie.,* too low for analysis purposes). The result is to underestimate the negative impacts to the Four Corners acquisition option. This, in turn, leads to the conclusion that more conservative (higher) CO_2 projections by APS could materially reduce the expected benefit of the acquisition. (Exhibit JCL-1, p.10)

Q. MR. WILDE CLAIMS THAT USING CRA'S EMISSIONS PRICE FORECAST WOULD NOT "SIGNIFICANTLY" CHANGE THE VALUE OF THE FOUR CORNERS ACQUISITION. DO YOU AGREE?

A. No. I demonstrated in my direct testimony that I believe this difference would overwhelm the entire claimed NPV benefit of the acquisition, and I provided a detailed explanation for why I believe this to be the case. Mr. Wilde simply makes an unsupported claim that there would not be a significant impact, and then goes on to describe the results of an entirely different analysis as if it had bearing on the question asked. It does not.

If the company wishes to provide a straightforward analysis of the impact of using a different CO_2 price forecast, it has the means to do so: simply re-run the analysis using the alternative emissions price forecast, and present the detailed results to the Commission. Merely claiming a result is no substitute for actually doing the analysis and providing the unobscured result.

Q. ON PAGE 6 OF HIS REBUTTAL TESTIMONY, MR. WILDE CHARACTRIZES YOUR CLAIM THAT PROJECTED CAPITAL EXPENDITURES ON THE FOUR CORNERS UNITS HAVE DECLINED SINCE THE COMPANY'S EARLIER FILING. DOES HE CHARACTERIZE YOUR TESTIMONY ACCURATELY?

A. No. I made clear in my testimony, and showed in Table 4, that the *undiscounted* projection of capital expenditures has increased, as Mr. Wilde

notes. What the company has done in its NPV analysis, however, is to move these projected costs later in time, so that the NPV impact of the expenditures is dramatically reduced. I noted that this is inconsistent with the treatment of expenditures on other plants in the APS system, and that this raised a red flag in my review of the company's analysis. Once again, Mr. Wilde does not actually address the question raised in my testimony, this time by mischaracterizing it entirely.

Q. ON PAGES 37-39 OF YOUR DIRECT TESTIMONY, YOU DISCUSS THE RISKS THAT THE FOUR CORNERS UNITS WILL NOT REMAIN ON-LINE THROUGHOUT THEIR PROJECTED LIFETIME, OR WILL NOT RUN AT AS HIGH A CAPACITY FACTOR AS IT HAS IN THE PAST. DID MR. WILDE ADDRESS THESE POINTS?

A. Mr. Wilde claimed that I offer (or Sierra Club offers) "no evidence that, properly maintained, Units 4 and 5 could not continue to operate at current levels for the assumed life of the plants." That is true. However, I do describe in detail why I believe that early shutdown or curtailed operations represents a significant *risk* associated with the Four Corners acquisition, and that the company has never provided the Commission with any analysis of how this might impact the claimed benefits for ratepayers.

It is commonplace to note in just about every financial statement that "past performance is no guarantee of future performance", and that is certainly the

case here. The company is expanding its dependence on aging, greenhouse gas-intensive infrastructure, and asks the Commission to ignore obvious associated risks. My suggestion was simply that the nature of these risks be put out in the open for full consideration, but Mr. Wilde ignores this point on the basis of Sierra Club's inability to predict the unpredictable – i.e., the operational performance of the units decades into the future.

Q. WHAT ARE YOUR CONCLUSIONS IN THIS SURREBUTTAL TESTIMONY?

A. In my direct testimony, I concluded (among other points) that "Without much more detailed explanation and justification of the company's assumptions and analytical decisions in each of these areas, I do not believe that the commission can reasonably accept APS's NPV analysis as valid or robust, nor can it approve the company's request in this docket." (44 at 18) I find that Mr. Wilde's rebuttal testimony has only perpetuated a pattern of unsupported claims and obfuscations. He purports to rebut the observations made and conclusions reached in my direct testimony, but in each instance he provides only vague and sometimes misleading descriptions, and sometimes direct mischaracterizations.

APS asks the Commission to saddle ratepayers with costs and risks for an acquisition that counters the general industry trend, extending and expanding its reliance on the most greenhouse gas intensive form of generation at a time when science, economics, and national policy point in a very different

direction. In doing so, the company assumes a high burden of proof that its investment on behalf of ratepayers is prudent. I do not believe that this standard has been met, so I recommend that the company's petition be denied.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing SURREBUTTAL TESTIMONY OF EZRA D. HAUSMAN ON BEHALF OF SIERRA CLUB on all parties of record in this proceeding by mailing a copy thereof, properly addressed with first class postage prepaid to:

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Dated at San Francisco, California, this 21st day of July, 2014.

/s/ Derek Nelson

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