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BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of Rocky Mountain Power for Authority to Increase its Retail Electric Utility Service Rates in Utah and for Approval of its Proposed Electric Service Schedules and Electric Service Regulations	**Docket No. 10-035-124**

PREFILED REBUTTAL TESTIMONY OF HOWARD GEBHART

[REVENUE REQUIREMENT]

[NON-CONFIDENTIAL VERSION]

The UAE Intervention Group (UAE) hereby submits the Prefiled Rebuttal Testimony of Howard Gebhart on revenue requirement issues.

DATED this 30th day of June, 2011.

/s/_____
Gary A. Dodge,
Attorney for UAE

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was served by email this 30th day of June, 2011, on the following:

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BEFORE

THE PUBLIC SERVICE COMMISSION OF UTAH

Non-Confidential Version

[Redacted confidential testimony highlighted]

Rebuttal Testimony of Howard Gebhart

on behalf of

UAE

Docket No. 10-035-124

[Revenue Requirement]

June 30, 2011

REBUTTAL TESTIMONY OF HOWARD GEBHART

Introduction and Purpose

Q. Please state your name and business affiliation.

R. My name is Howard Gebhart. I am employed at Air Resource Specialists, Inc. (ARS), located at 1901 Sharp Point Drive, Suite E, Fort Collins, CO 80525. ARS is an environmental engineering and consulting firm. At ARS, I am the Manager for the Environmental Compliance Section. My staff and I assist regulated industries as well as government and commercial clients with environmental permitting and compliance issues, primarily with respect to the Clean Air Act and Clean Water Act.

Q. Did you also provide Direct Testimony for this Docket?

R. Yes.

Q. Please describe your education and technical expertise.

R. I have over 30 years experience with air quality technical and regulatory matters, with my last 15 years at ARS. Prior to joining ARS, I have held positions with Trinity Consultants and ENSR Consulting and Engineering (now known as AECOM). I started my professional career with a predecessor agency to what is now the Utah Department of Environmental Quality. I have testified as an Expert Witness in other legal and administrative proceedings concerning issues surrounding the Clean Air Act. With respect to my academic background, I have a Bachelor of Science degree in Professional

Meteorology issued by Saint Louis University and a Master's degree in Meteorology issued by the University of Utah.

Q. What is the purpose of your rebuttal testimony?

R. My testimony today is in response to the Direct Testimony filed by Mr. Matthew Croft on behalf of the Utah Division of Public Utilities. Mr. Croft's testimony in part commented on the air pollution control projects at various PacifiCorp-operated electric generating units (EGUs) for which cost recovery of capital expenses is part of this Docket. Mr. Croft apparently reached the conclusion that the pollution control projects at PacifiCorp's EGUs were necessary to meet the environmental requirements of the Clean Air Act and other applicable environmental laws and regulations. He also concluded that these pollution control projects had reasonable costs.

Q. Do you agree with Mr. Croft's assessment?

R. No, I strongly disagree with Mr. Croft's conclusions, particularly as they relate to four of PacifiCorp's EGUs. My conclusion is that PacifiCorp overshot the mark in designing and implementing the emissions control program at many of its EGUs, in particular Hunter Units #1 & #2, Huntington Unit #1, and Dave Johnston Unit #3. The pollution control projects at these plants in particular far exceed the minimum regulatory requirements of the Clean Air Act, and specifically the requirements of Utah's and Wyoming's Regional Haze Regulations, which generally required subject EGUs to employ Best Available Retrofit Technology or BART. The associated costs for

emission controls being installed by PacifiCorp at these units are excessive given the degree of environmental improvement achieved. Correlating the cost of pollution controls to the environmental benefits achieved is the core element of any cost-effectiveness evaluation.

Q. What information did you consider in developing your rebuttal testimony?

R. I considered the written Revenue Requirement Direct Testimony prepared by Mr. Matthew Croft along with the various exhibits included as part of that testimony, which included information provided by PacifiCorp in response to data requests from the Division of Public Utilities (DPU). My assessment of Mr. Croft's testimony is that he has generally accepted the data and conclusions offered by PacifiCorp in its data responses without conducting any significant independent review or verification of the information provided or the claims made. In addition, I have considered information provided by PacifiCorp pursuant to the Utah Association of Energy Users Intervention Group's (UAE) 14th data request, which asked for clarifying and supporting information related to the various Exhibits and other information provided to DPU. I have critically evaluated the supporting data, information, and conclusions contained in PacifiCorp's responses to the various DPU and UAE data requests to assess whether the data provided support the conclusions reached by PacifiCorp regarding the pollution control projects in question, and which were generally restated by Mr. Croft in his Direct Testimony.

Cost Effectiveness Calculations

Q. Did the DPU data requests ask about the cost-effectiveness of the pollution control projects?

R. Yes. In response, PacifiCorp provided Attachment DPU 36.5, which includes a table purporting to show estimated SO_2 emissions reductions and control costs for Hunter Units #1 and #2, Huntington Unit #1, Jim Bridger Units #1, #2, #3, and #4, Wyodak, and Cholla Unit #4. Based on the cost and emissions control information provided, the table purports to calculate cost-effectiveness in dollars per ton of SO_2 removed. In this table, the SO_2 control costs for PacifiCorp's Utah plants (Hunter #1 & #2 and Huntington #1) range between about $4,000 per ton to $5,850 per ton.

Q. These calculations differ from those reflected in your direct testimony. What are your initial reactions to the information provided in this table?

R. There are significant errors in this Table, which I will discuss below. Even were the Table accurate, however, PacifiCorp's calculated cost-effectiveness for SO_2 removal at each of the Utah units ranges from $4,000 to nearly $6,000 per ton. As explained in my Direct Testimony, standard regulatory practice is that SO_2 cost-effectiveness in excess of $2,000 per ton is generally not reasonable and controls with such costs would not be required by BART. Thus, even if these were accurate values, they would still support my conclusion that the SO_2 control projects were not cost-effective and would not

have been required under any applicable or reasonably anticipated legal or regulatory requirement.

Q. You mentioned errors in the data contained in Attachment DPU 36.5. Please explain.

R. The amount of SO_2 controlled is significantly overstated in Attachment DPU 36.5. This error leads to underestimating the true cost effectiveness of the pollution control projects.

Q. Please elaborate on the errors in Attachment DPU 36.5 regarding the amount of SO_2 controlled.

R. In calculating tons controlled, Attachment DPU 36.5 calculated the baseline SO_2 emissions value using the *allowable* emission rate from the respective permit at each plant that was in effect prior to the time that the pollution control project was installed, rather than *actual* emissions. The degree of emissions control was then calculated based on the projected future SO_2 emissions compared to this "allowable" emissions baseline. This is contrary to any accepted or standard practice. Overestimating the baseline emissions generates a corresponding overestimate in the environmental control benefits of the project.

Q. Can you elaborate with specific examples?

R. For Hunter Unit #1, Hunter Unit #2, and Huntington Unit #1, the baseline emissions were estimated by PacifiCorp at 0.21 lb/MMBtu, which was the applicable air permit level at each plant prior to the scrubber upgrades. The

problem with this approach is that these EGUs never really emit at the maximum allowable rate. Other data provided by PacifiCorp in the record for this Docket, for example Confidential Response to DPU Data Request 36.10 and Tables 1 and 2 from Response to DPU Data Request 36.3, show significantly less actual SO_2 emissions at these Utah facilities compared to the maximum allowable emissions used in Attachment DPU 36.5. In essence, in Attachment DPU 36.5, PacifiCorp is attempting to claim credit for controlling SO_2 emissions that were never really emitted.

Q. Is the approach used in the calculations reflected in Attachment DPU 36.5 endorsed by any air quality regulatory agency to your knowledge?

R. No. The standard and accepted regulatory approach when calculating the cost-effectiveness of a pollution control device under BART or any similar emissions control requirement where cost is part of the regulatory decision making process uses actual emissions to set the baseline emissions rate and allowable emissions to set the future emissions rate. Indeed, this is the approach used in each of the WDEQ analyses attached as Exhibits to my Direct Testimony. All thresholds for establishing the reasonableness of the pollution control costs under BART and similar programs also rely on data where the historical and future emissions are defined in this manner. Consistency with this standard regulatory practice is necessary for any calculated cost-effectiveness values to be meaningful.

Q. What data did you rely upon in your Direct Testimony regarding the pollution control benefits of the pollution control projects that were reviewed?

R. For PacifiCorp's Utah EGUs (Hunter Units #1 and #2 and Huntington Unit #1), my Direct Testimony relies on the SO_2 emissions control benefits determined by the Utah Division of Air Quality in Utah's Regional Haze State Implementation Plan (SIP). For Dave Johnston Unit #3, my Direct Testimony relies on the SO_2 cost-effectiveness data compiled and used by the Wyoming Department of Environmental Quality (WDEQ). Moreover, the data I used was generated in a timeframe that is generally contemporary with the timeframe in which PacifiCorp made its decision to proceed with the pollution control upgrades at its plants.

Q. Should Mr. Croft have relied on Attachment DPU 36.5 in assessing the reasonableness of the costs for PacifiCorp's pollution control projects at issue within this docket?

R. No. Due to the errors described above, neither Mr. Croft nor anyone else should have relied upon the data contained in Attachment DPU 36.5. These data do not accurately depict the environmental benefits and associated cost-effectiveness of the pollution control projects undertaken by PacifiCorp, nor do they provide a meaningful comparison with other industry data calculated following the standard practice methods described above. The data presented

in my Direct Testimony accurately reflects the standard regulatory assessment of the cost-effectiveness for PacifiCorp's pollution control projects.

Cost-Effectiveness Threshold

Q. PacifiCorp's Response to DPU Data Request 36.6 makes the startling claim that SO_2 removal costs as high as $7,500 per ton have been found to be cost effective. Mr. Croft apparently relied upon this claim in reaching many of his conclusions. You have testified that costs in excess of $2,000 per ton are not considered cost effective for SO_2 BART purposes. What do you think of Mr. Croft's reliance on this PacifiCorp claim?

R. His reliance is misplaced. I agree that Mr. Croft appears to have relied heavily upon PacifiCorp's misleading claim in its response to DPU Data Request 36.6 that "BART determinations issued by the EPA and other state agencies for SO_2 and NOx emission control projects have demonstrated that removal costs of up to $7,500 per ton are not considered cost prohibitive."

The clear and intended implication of this claim is that regulatory authorities have found $7,500 per ton for SO_2 removal to be cost-effective and that controls costing this much are appropriate as BART. That claim is not only materially inconsistent with my experience and all available data, it is also false and misleading. UAE Data Request 14.5 asked PacifiCorp for data supporting its claim that $7,500 per ton of SO_2 removal had been found to be reasonable. The *only* information supplied by PacifiCorp in response,

provided in Attachment UAE 14.5, relates to a single *nitrogen oxides* (NOx) BART determination for the San Juan coal-fired electric generating station in New Mexico.

BART analyses of *NOx* emissions control projects cannot be used (and are not used by regulatory agencies) to justify similar costs for SO_2 control projects. In my Direct Testimony, I cited numerous examples of SO_2 BART emission control analyses that clearly support my conclusion that standard regulatory practice for cost-effectiveness for SO_2 BART is no more than $2,000 per ton. The data provided by the Company in Attachment UAE 14.5 is not at all relevant to the question at hand and does nothing to change my opinion on this topic. Mr. Croft was apparently misled by PacifiCorp's misleading and unsupported claim that $7,500 per ton is a valid benchmark for reasonable costs on a scrubber upgrade project designed to reduce SO_2 emissions.

As explained in my Direct Testimony, in my experience, any BART analysis requiring a cost as high as $7,500 per ton for removal of any pollutant is unusual and not representative of the vast majority of BART determinations. Costs as high as these are not cost effective except in unusual or extreme circumstances where the additional costs can be justified for other technical reasons as allowed in the "five-factor" BART analysis.

Coal Sulfur

Q. Mr. Croft's Direct Testimony also appears to accept the claim by PacifiCorp that projected increases in sulfur in coal to be used at various plants might help justify the scrubber upgrades. How do you respond to this claim?

R. I disagree. In the first place, I have not seen substantive support for this claim nor have I seen any evidence that projected increases in sulfur content claimed by PacifiCorp were known or expected at the time the decision was made to proceed with these scrubber upgrade projects. Thus, I don't see how it could be used to justify PacifiCorp's decision in any event. Moreover, the data provided by PacifiCorp do not support the Company's claim that the upgraded scrubber projects are needed to deal with the projected increase in sulfur content.

Relevant data provided by PacifiCorp regarding coal sulfur content is contained in its Confidential Response to DPU Data Request 36.10, which is attached to Mr. Croft's Direct Testimony. That data request asked about past performance of the pollution control systems at Hunter Unit #2 and whether PacifiCorp agreed that the scrubber system before being upgraded was performing well and meeting emissions requirements. PacifiCorp's Response to DPU Data Request 36.10 was marked Confidential, so my discussion or analysis of specific data contained therein will also be treated as Confidential.

Q. What data did PacifiCorp provide with respect to sulfur?

R. PacifiCorp provided a historical review of SO_2 emissions at Hunter Unit #2 versus the coal sulfur content. Both SO_2 emissions and coal sulfur were reported as annual averages from 1999 through 2010. PacifiCorp's Response to Data Request DPU 36.10 states that the expected increase in coal sulfur impacted the old scrubber systems' emissions performance and infers that the scrubber upgrades were necessary to meet environmental standards due to the higher sulfur coal.

Q. Do you agree with this PacifiCorp claim?

R. No. The claim is unsupported and, as discussed below, inaccurate.

Q. What did you do to analyze the data provided by PacifiCorp?

R. I plotted the historical coal sulfur vs. emissions data at Hunter Unit #2 taken from that Exhibit to determine the extent of the relationship between coal sulfur and SO_2 emissions. I also generated a best-fit linear regression based on these data. The graph that I generated using these data is provided as Confidential Attachment Gebhart 1 (Confidential UAE Exhibit RR 2.1R).

Q. What are your findings based on the data shown in Confidential Attachment Gebhart 1?

R. First, while the best-fit linear regression shows that SO_2 emissions generally increase with higher coal sulfur, the slope of the best-fit linear regression is [redacted], showing that, based on historical data, the increase in SO_2 emissions is significantly less than the corresponding increase in coal sulfur. If the plant emissions responded only to changes in coal sulfur content, the

slope of the best-fit linear regression would be closer to 1.0. A slope that is [redacted] suggests factors other than coal sulfur content are also critical to the resulting SO_2 emissions. In my view, the historical emissions vs. coal sulfur data suggest that the control effectiveness of the Hunter Unit #2 scrubber system is also important and perhaps even more so than just the change in coal sulfur. Also, because the slope of the best-fit linear regression is [redacted], these data show that the performance of the SO_2 scrubbing system at Hunter Unit #2 actually seems to improve as the coal sulfur increases.

Q. Do you have any additional findings or conclusions regarding Confidential Attachment Gebhart 1?

R. Yes, the R-Squared value shown in the Attachment represents the "correlation coefficient" for the best-fit linear regression equation. The "correlation coefficient" ranges between 0 and 1, with values closer to 1 representing improved correlation and less scatter in the individual data points compared to the best-fit correlation. An R-Squared value of [redacted] indicates that sulfur is at best poorly correlated with SO_2 emissions and as such, should not be used as a future predictor of SO_2 emissions.

Q. How do these findings relate to your assessment of Mr. Croft's testimony?

R. Mr. Croft appears to have relied upon the data provided in Response to DPU Data Request 36.10 and to have accepted at face value the explanations

provided by PacifiCorp that increased coal sulfur content will result in increases in SO_2 emissions that will require the scrubber upgrade projects at its Utah facilities in order to maintain environmental compliance. However, a critical evaluation of the supporting data that Mr. Croft relied upon in reaching his conclusion shows that SO_2 emissions are in fact poorly correlated with coal sulfur content. There is variability in the historical performance of the SO_2 scrubbing systems which also impacts SO_2 emissions. As such, the estimates of future SO_2 emissions made by PacifiCorp based solely on changes to fuel sulfur content are unreliable. Likewise, the calculated environmental benefits and cost-effectiveness of emissions controls based on these data are also unreliable. Mr. Croft should not have relied on these data in reaching the findings in his Direct Testimony.

Projected Emission Reductions

Q. Mr. Croft's testimony also includes Attachment DPU 36.3, a response from PacifiCorp to DPU Data Request 36.3, which addresses projected emission reductions from the scrubber upgrades. Please address this data.

R. In Attachment DPU 36.3, PacifiCorp provided two tables containing historical SO_2 emissions data and future projections for Hunter (Units #1, #2, & #3), Huntington (Units #1 & #2), Jim Bridger (Units #1, #2, #3, & #4), Wyodak, and Cholla Unit #4. In Attachment DPU 36.3 Table 1, PacifiCorp estimated

the future emissions going out to Year 2020 and compared these emissions to baseline emissions from 2006 in order to purportedly calculate the cost effectiveness of emission controls at each plant on a year-to-year basis. My understanding of Table 1 is that these estimates are intended to account for PacifiCorp's unsupported claim of increasing SO_2 emissions associated with expected increases in the coal sulfur content, discussed above. Based on PacifiCorp's data, coal sulfur for Hunter Unit #1 and Unit #2 peaks at [redacted] before leveling at [redacted] and later years. At Huntington Unit #1, the coal sulfur content peaks at [redacted], but drops back to [redacted] and later years. In Table 2, PacifiCorp projected the future emissions at each plant assuming that the pollution control projects were not implemented, while still accounting for the higher coal sulfur content. In preparing Attachment DPU 36.3, PacifiCorp appears to be improperly claiming credit for projected SO_2 emission reductions that have not yet occurred, that have not been demonstrated, and that are based on future emission projections that were not known at the time the decision was made to upgrade the scrubbers.

Q. Did you ask for additional information regarding these claims?

R. Yes, UAE Data Request 14.3 asked for information supporting or relating to PacifiCorp's response to DPU Data Request 36.3. In response, PacifiCorp provided Confidential Attachment UAE 14.3 to explain the emission calculations in Tables 1 and 2 from Attachment DPU 36.3.

Q. What did you find from reviewing Confidential Attachment UAE 14.3?

R. For Table 1 in Attachment 36.3, the supporting information provided by PacifiCorp show that projected future emissions at Hunter Unit #1, Hunter Unit #2, and Huntington Unit #1 were all calculated assuming a future emission rate of [redacted] lb/MMBtu. However, the air quality permit issued to PacifiCorp for each of these facilities allows emissions up to 0.12 lb/MMBtu following installation of the scrubber upgrades. So, the data supporting Table 1 from Attachment 36.3 assume that in future years, PacifiCorp will be operating these plants at emissions levels that are [redacted] the allowable permit rate. Although I would expect future actual emissions to be [redacted], when calculating the cost-effectiveness of pollution controls for determination of a regulatory standard such as BART, the standard practice is to assume future emissions equal to the regulatory limit. By not following the standard practice, PacifiCorp has inflated the claimed degree of SO_2 emissions reduction at Hunter Unit #1, Hunter Unit #2, and Huntington Unit #1 in Table 1. This in turn results in an erroneous cost-effectiveness claim compared to standard practice. By not following standard practice in cost and emissions control calculations, any resulting cost-effectiveness calculations cannot be compared to other similar facilities to assess whether the costs are reasonable under BART. Deviating from the standard practice convolutes such comparisons.

Q. What did you determine from Confidential Attachment UAE 14.3 regarding the Company's supporting information for Table 2 in Attachment DPU 36.3?

R. For Table 2 in Attachment DPU 36.3, the supporting information show that future emissions were estimated using a baseline emission rate of 0.21 lb/MMBtu at Hunter Unit #1, Hunter Unit #2, and Huntington Unit #1. This was the maximum allowable emissions in each of the facility permits prior to the permit changes which were issued for the scrubber upgrades that are under discussion in the Docket. As stated earlier in my testimony, the standard regulatory practice defines baseline emissions based on actual emissions and not the maximum potential emissions. While there may be some difficulty in estimating actual emissions for future years because these emissions have not yet occurred, it is inherently unfair to assume that baseline emissions operate at their maximum allowable emissions, while the projected emissions after control assume an emissions level [redacted] the maximum allowable limit. In essence, the assumptions used by PacifiCorp to generate Table 2 in Attachment DPU 36.3 serve to inflate the calculated SO_2 emission reductions associated with the scrubber upgrade projects. This in turn makes the associated costs look more cost-effective than they are in reality.

Q. Would a regulatory agency utilize PacifiCorp's data or approach in calculating cost-effectiveness of scrubber upgrades?

R. No. As explained above, PacifiCorp's calculations do not follow standard regulatory practice and tend to significantly over-estimate emission reductions. Air regulators would use data and an approach similar to that used in my Direct Testimony. Indeed, the WDEQ did use such an approach and comparable data in evaluating the Wyoming scrubber projects. Moreover, much of the data used by PacifiCorp would not have been available at the time the cost-effectiveness of the scrubber upgrades were or should have been evaluated. For example, PacifiCorp claims that the projected increase in coal sulfur first surfaced in 2007, whereas PacifiCorp filed its Notice of Intent for the air permit applications requesting approval of the scrubber upgrades in 2006.

Q. Even if PacifiCorp's inflated emission reduction claims were accepted, would it change your conclusions about the cost-effectiveness of any of the scrubber projects?

R. No. Despite the serious concerns expressed above regarding the validity of the PacifiCorp SO_2 emissions data presented in Attachment DPU 36.3, I took those data at face-value and then calculated the cost-effectiveness using the project-specific cost data described in my Direct Testimony. For each of the Utah units (Hunter Unit #1 and #2 and Huntington Unit #1), the degree of emissions control was estimated using the average for the future years shown in Table 1 and Table 2 from Attachment DPU 36.3.

Q. Please explain your calculations regarding Hunter Unit #1.

R. At Hunter Unit #1, Table 1 calculated an average future year SO_2 removal of 1,710 tons per year (tpy) for Years 2014 through 2020. Using this figure and the annualized costs of the scrubber project from my Direct Testimony ($8,176,160), the calculated cost-effectiveness is $4,807 per ton SO_2 removed. Performing the same calculations using Table 2, the future year average SO_2 removal is 1,706 tpy over the period 2015 through 2020 and the cost-effectiveness is $4,793 per ton SO_2 removed. Thus, even using the inflated calculations provided by PacifiCorp in Attachment DPU 36.3, which significantly underestimates the real cost effectiveness values, the costs remain more than a factor of two higher that the relevant standard for cost-effective BART controls.

Q. Describe your calculations regarding Hunter Unit #2.

R. At Hunter Unit #2, Table 1 calculated a future year average SO_2 removal of 747 tons per year (tpy) for Years 2011 through 2020. Using this figure and the annualized costs of the scrubber project from my Direct Testimony ($7,426,325), the calculated cost-effectiveness is $9,942 per ton SO_2 removed. Performing the same calculations using Table 2, the future year average SO_2 removal is 1,752 tpy over the period 2012 through 2020 and the calculated cost-effectiveness is $4,239 per ton SO_2 removed. Again, the inflated data provided in Attachment DPU 36.3 still results in cost-effectiveness values that are more than a factor of four higher than the relevant standard for cost-effective BART controls using Table 1 and more

than a factor of two higher than the relevant standard for cost-effective BART controls using Table 2.

Q. Explain your calculations regarding Huntington Unit #1.

R. At Huntington Unit #1, Table 1 calculated a future year average SO_2 removal of 1,134 tons per year (tpy) for Years 2010 through 2020. Using this figure and the annualized costs of the scrubber project from my Direct Testimony ($5,797,646), the calculated cost-effectiveness is $5,113 per ton SO_2 removed. Performing the same calculations using Table 2, the future year average SO_2 removal is 1,536 tpy over the period 2014 through 2020 and the cost-effectiveness is $3,775 per ton SO_2 removed. Here, again, even using PacifiCorp's data from Attachment DPU 36.3 which materially underestimates the calculated cost effectiveness value, the cost remains more than a factor of two and one-half higher that the relevant standard for cost-effective BART controls using Table 1 and almost a factor of two higher than the relevant standard for cost-effective BART controls using Table 2.

Q. If you were to accept PacifiCorp's inflated emission reduction claims in Attachment DPU 36.3, would it affect your conclusions that the additional scrubber controls at the Utah plants were not cost-effective?

R. No, it would not change any of my conclusions. Even accepting the data provided in Attachment DPU 36.3 regarding the level of projected SO_2 emission reductions from the Utah scrubber upgrade projects, and despite the fact that the Company's calculations do not follow standard regulatory

practice, the calculated cost-effectiveness still does not come close to meeting a reasonable cost-effectiveness standard for BART. The scrubber upgrade projects at PacifiCorp's Utah plants (Hunter Unit #1, Hunter Unit #2, and Huntington Unit #1) are not cost-effective as assumed by Mr. Croft in his Direct Testimony. Mr. Croft does not appear to have made any of his own calculations about cost-effectiveness for these particular projects prior to reaching his conclusions and he did not critically evaluate the Company's calculations to see if they conformed to standard regulatory practice. Moreover, he erroneously relied upon PacifiCorp's unsupported and inaccurate claim that $7,500 per ton is a reasonable or accepted SO_2 cost-effectiveness threshold.

End of Life Issues

Q. Mr. Croft's testimony also addresses alleged end-of-life and performance issues with respect to some of the equipment replaced in connection with scrubber upgrades. How do you respond to this testimony?

A. Mr. Croft's testimony appears to quibble with some conclusions reached by the Arbitrator in the Deseret Power/PacifiCorp arbitration to the effect that, in contrast to the baghouse conversion at issue in that case, end of life issues did not justify PacifiCorp's decision to proceed with the scrubber upgrade at Hunter Unit #2 and that these scrubbers were working well. Understood in

the context of the Arbitration, the Arbitrator's conclusions are fully supported and accurate.

In the Arbitration, PacifiCorp claimed that it faced immediate end-of-life issues with respect to the Hunter Unit #2 ESP that would effectively have required it to either replace it with a new ESP or convert it to a baghouse very soon. PacifiCorp claimed a relatively small incremental cost of converting to a baghouse over the cost of a new ESP, and argued that the added incremental cost was reasonable in light of claimed benefits of a baghouse. While the arbitrator chided PacifiCorp for never conducting a serious analysis of alternatives and costs, he nevertheless accepted PacifiCorp's conclusion that potential benefits of a baghouse made the choice of a baghouse a reasonable choice under the circumstances.

PacifiCorp did not even attempt to make similar claims with respect to the Hunter Unit #2 scrubber. That is, PacifiCorp did not argue that the scrubber was near the end of its useful life or performing so poorly that it would need to be replaced very soon in all events. Thus, the Arbitrator's Award correctly noted that end-of-life issues addressed in the baghouse context did not apply in the scrubber context. I fully agree with the Arbitrator on this issue, and I believe Mr. Croft misunderstood what the Arbitrator meant.

Mr. Croft's testimony appears to accept and rely upon PacifiCorp's data responses to the effect that some of the equipment to be replaced in

connection with the scrubber upgrades allegedly had some performance issues or were within several years of their projected life spans. Mr. Croft apparently assumes that these claims are relevant to an evaluation of the cost effectiveness of the challenged scrubber upgrades. In fact, all such issues and claims are irrelevant to a BART evaluation of the cost effectiveness of a scrubber upgrade.

Q. Why is it irrelevant to a BART determination whether a portion of the equipment to be replaced in connection with a scrubber upgrade was allegedly experiencing performance problems or is approaching the end of its projected life?

A. BART cost-effectiveness evaluations are based upon the cost of installing the proposed upgrade, along with all associated and required equipment. It is not relevant to a BART analysis whether any portion of the equipment to be replaced would have been replaced in the near future, or whether any of it was very recently replaced. In this instance, the higher SO_2 removal rates planned for the upgraded scrubbers required different and/or larger equipment to meet PacifiCorp's design specifications. Regardless of the age, status or condition of the old equipment, a BART analysis looks at the total projected costs of the proposed upgrade, including all necessary new equipment. The regulatory procedures for assessing costs under BART do not provide for any "credit" for the value of existing pollution control equipment.

The fact that the age or condition of equipment to be replaced is irrelevant to a BART analysis is confirmed by an examination of data submitted by PacifiCorp to the WDEQ and relied upon by the WDEQ in connection with the Wyoming PacifiCorp BART analyses. Those submissions and analyses (attached as Exhibits to my Direct Testimony) make no attempt to determine or factor in the age or condition of any of the equipment to be replaced. Moreover, any attempt to incorporate such factors into a BART analysis would be extremely subjective and unhelpful. Instead, air regulatory agencies consider all costs required by the upgrade under evaluation to determine whether those costs justify the result (i.e., improved emissions control performance). The analyses that I conducted, like the analyses conducted by the WDEQ, reflect the proper method for performing a BART cost-effectiveness analysis. Thus, while I am unaware of any evidence establishing end-of-life or performance claims at any of PacifiCorp's units, any such data or claims are immaterial to my conclusion that the scrubber upgrades at the Utah plants were not cost effective and were not mandated by regulatory requirements.

Dave Johnston Unit #3

Q. Let us now turn to Mr. Croft's evaluation of the pollution control projects for PacifiCorp's Wyoming plants. Can you briefly summarize

your understanding of Mr. Croft's testimony as it pertains to PacifiCorp's Wyoming plants and specifically Dave Johnston Unit #3?

R. In general, Mr. Croft concludes that the Wyoming Regional Haze SIP requires PacifiCorp to install the pollution control projects at issue in this Docket and specifically, the fabric filter baghouse emissions controls at Dave Johnston Units #3 and #4. Furthermore, Mr. Croft suggests that the Wyoming Department of Environmental Quality independently determined that these fabric filter baghouse control projects were all cost-effective.

Q. What is Mr. Croft's basis for his conclusions?

R. Mr. Croft states that he has reviewed the WDEQ BART reports on each of the subject units. Those are the same technical reports that I have relied upon in preparing my Direct Testimony. However, in my evaluation of the same data, I reached a very different conclusion as to Dave Johnston Unit #3.

Q. So, you relied on the same technical and regulatory information from the Wyoming DEQ about Dave Johnston Unit #3, but reached a different conclusion. Why?

R. My belief is that Mr. Croft lacks sufficient understanding of the complexities of the BART and Regional Haze technical and regulatory process to fully understand and properly interpret the information in the various Wyoming BART reports, including the WDEQ report supporting the Dave Johnston Plant BART decision. In fact, Mr. Croft admits in his Direct Testimony that he lacks extensive expertise in this subject matter. The difficulty experienced

by Mr. Croft in understanding and interpreting this information is not surprising; it is a very complicated area that is easily misunderstood by those who lack extensive experience.

Q. Please elaborate on why you reached a different conclusion than Mr. Croft regarding Dave Johnston Unit #3.

R. Mr. Croft's Direct Testimony states that, based on the WDEQ analyses, "*all of the FGD projects on Wyoming plants are cost effective and have reasonable costs.*" Via footnote, he cites the Wyoming DEQ BART report AP-6041, Page 23, as the basis for his conclusion regarding the Dave Johnston Plant. That document is attached to my Direct Testimony as UAE Exhibit RR 2.7.

In fact, the WDEQ Document cited by Mr. Croft reaches a very different conclusion regarding Dave Johnston #3 emission controls. The WDEQ found: "The cost effectiveness and incremental cost effectiveness of the proposed wet FGD and dry FGD controls for Units 3 and 4 are reasonable, *except for the incremental cost effectiveness of installing a new polishing fabric filter with dry FGD on Unit #3*" (at 23). Mr. Croft either ignored or failed to understand the qualifying statements of the WDEQ regarding the incremental cost effectiveness of the Dave Johnson Unit #3 fabric filter baghouse. Clearly, the Wyoming DEQ did *not* reach the conclusion on cost-effectiveness assumed by Mr. Croft with respect to Dave Johnston Unit #3.

Q. What cost-effectiveness for the Dave Johnston #3 fabric filter baghouse was determined by the Wyoming DEQ?

R. In Report AP-6041, Table 17 (Page 22), the cost effectiveness for the dry FGD with fabric filter baghouse option was calculated at $1,837 per ton SO_2 removed, but the *incremental* cost-effectiveness compared to the dry FGD with electrostatic precipitator (ESP) option was $10,700 per ton SO_2 removed. It is this incremental cost effectiveness that made the baghouse pollution control option not cost effective at Dave Johnston Unit #3.

Q. Can incremental cost effectiveness be used to dismiss a particular emissions control option under the EPA BART Guidelines?

R. Yes. The regulatory protocols described in EPA's BART Guidelines at 40 CFR 51 Appendix Y allow one to use the incremental cost effectiveness as part of the BART decision. This topic was covered in my Direct Testimony. The WDEQ was correct and justified in relying upon incremental cost effectiveness for the fabric filter baghouse control at Dave Johnston Unit #3 in its SO_2 BART review.

Q. How did the Wyoming DEQ use incremental cost effectiveness in its BART analysis of the fabric filter baghouse emissions controls at Dave Johnston Unit #3?

R. The WDEQ's Dave Johnston Unit #3 BART analysis concluded that incremental environmental benefits of the fabric filter baghouse in controlling SO_2 emissions at Dave Johnston Unit #3 was *not* BART based on the incremental costs over the costs incurred using the dry SO_2 scrubbing system with the existing ESP unit. Furthermore, based on particulate matter (PM)

emissions control benefits, which is the principle function of both an ESP and a fabric filter baghouse, the WDEQ also found that the costs for baghouse installation were not reasonable under BART (See WDEQ Document AP-6041, Page 48). So, in actuality, and contrary to Mr. Croft's conclusion, the WDEQ found that the fabric filter baghouse controls at Dave Johnston Unit #3 were not reasonably cost-effective, either in terms of controlling PM or SO_2 emissions. I agree with the WDEQ that the Dave Johnston Unit #3 fabric filter baghouse is not a cost-effective emissions control option under BART.

Q. The WDEQ's BART Report on Dave Johnston (AP-6041) uses the term "polishing fabric filter" to describe the Dave Johnston Unit #3 fabric filter. Do the two terms describe the same thing?

R. Typically, no. A "polishing fabric filter" or "polishing baghouse" is different from a full-scale fabric filter baghouse. The WDEQ Report is inaccurate in using the term "polishing fabric filter" to describe the proposed Dave Johnston Unit #3 pollution controls, apparently a holdover from a prior analysis. In fact, PacifiCorp was clearly proposing to install, and is actually installing, a full-scale fabric filter baghouse at Dave Johnston Unit #3. It is clear that the WDEQ knew this and analyzed a full-scale fabric filter baghouse, despite the erroneous label.

In reviewing the WDEQ BART records supporting the Dave Johnston BART decision, it is clear that WDEQ actually reviewed the costs for a full-scale fabric filter baghouse at Dave Johnston Unit #3 and that the reference to

a "polishing fabric filter" is an erroneous hold-over. From the WDEQ BART records, it appears that at some point, a "polishing fabric filter" was being considered for emissions control at Dave Johnston Unit #3, but the Company modified the proposal to utilize a full-scale fabric filter. The erroneous reference was simply not updated.

The Dave Johnston Unit #3 costs relied upon by WDEQ in Document AP-6041 came from a March 26, 2008 submittal by PacifiCorp entitled "Addendum to Dave Johnston Unit 3 BART Report," attached to my Direct Testimony as UAE Exhibit RR 2.8. In the March 26, 2008 PacifiCorp submittal, the Dave Johnston Unit #3 pollution control equipment is described as a "new fabric filter," and it is also described as "PacifiCorp committed controls" (at 7). Based on my knowledge of PacifiCorp's scrubber proposals and commitments, and of the timeline of events at Dave Johnston, it is clear that the March 26, 2008 PacifiCorp report was in fact based on a full-scale fabric filter baghouse. The WDEQ BART evaluation of Dave Johnston Unit #3 actually considered costs for the full-scale fabric filter unit proposed by PacifiCorp, and the reference by WDEQ in the Dave Johnston BART report to a "polishing fabric filter" is an oversight of no significance (other than possible confusion).

Voluntary vs. Required Actions

Q. Is Mr. Croft correct in his apparent conclusion that PacifiCorp was required to install the scrubber upgrades to satisfy applicable air-quality permits and SIP requirements?

R. No. His Direct Testimony appears to place considerable reliance on his understanding that PacifiCorp received enforceable permits from both the Wyoming DEQ and the Utah DEQ that mandate the pollution control projects at issue in this Docket. While it is true that the scrubber upgrades are *now* required under permits issued by air quality regulatory agencies and these controls are incorporated into current State Implementation Plans, Mr. Croft appears not to understand and/or appreciate that the permits themselves resulted from the voluntary requests and actions of PacifiCorp, and they were in no way required by any applicable or reasonably anticipated requirements of the Clean Air Act.

Q. Please elaborate.

R. Mr. Croft quotes the term "accepted as BART" from various WDEQ BART reports as indicating that the emission controls selected for each PacifiCorp EGU in Wyoming were determined by WDEQ to be a regulatory requirement based on the BART process. This assumption is inaccurate. Indeed, it is also contradicted by other statements in these same WDEQ documents. For example, the WDEQ expressly found that the fabric filter baghouse at Dave Johnston Unit #3 was *not* cost-effective under BART, as discussed above.

Emission controls that are not cost-effective do not reflect BART, and the language in WDEQ's BART reports are actually intended to convey that distinction. Even though not cost-effective and not required by BART, because PacifiCorp voluntarily agreed to install emissions control equipment that exceeded BART, WDEQ nevertheless "accepted" these controls as satisfying the legal requirements for BART. This critical distinction was apparently not understood by Mr. Croft. WDEQ's BART record is clear that the voluntary controls agreed to by PacifiCorp actually overreached the Clean Air Act requirement for BART in certain cases on the basis of cost-effectiveness. The fact that the WDEQ nevertheless "accepted" these non-cost-effective controls as satisfying BART (because PacifiCorp had already committed to install them in all events) does not mean that they are or represent BART. Rather, they were "accepted" as (more than) satisfying BART requirements.

The Company's commitment to install these scrubber upgrades even though they were not cost effective also violated the commitment contained in the MEHC agreement cited by Mr. Croft's testimony to the effect that PacifiCorp would "reduce SO_2 emissions by more than 50% *using cost-effective equipment.*" The emission control technologies selected by the Company have in several cases been shown not to be cost-effective. In the case of Dave Johnston Unit #3, the WDEQ clearly agreed and found that the control options selected by the Company were not cost effective.

Q. Is the same true for PacifiCorp's EGUs in Utah?

R. Yes, although in Utah a formal five-factor BART analysis was not conducted so the Utah DEQ did not have the opportunity to consider the costs of emissions control in its BART decisions for the Hunter and Huntington stations. Nevertheless, the outcome was similar. PacifiCorp voluntarily committed to a set of emission controls, which were later incorporated into Utah's Regional Haze SIP and various air quality permits for the Hunter and Huntington EGUs. However, as in Wyoming, the current regulatory requirements on PacifiCorp's Utah EGUs resulted from voluntary actions on the part of the Company, and were not necessary to meet the underlying Clean Air Act requirements or other standards. It is illogical and inaccurate to suggest that UDEQ could have reached a decision to establish and then prescribe a regulatory level for BART controls when neither the Company nor the agency performed any technical BART analyses. The emissions control projects at Hunter and Huntington were clearly voluntary actions by PacifiCorp that were later incorporated into Utah's legal requirements through the SIP and various air permits.

Q. Is your opinion that these projects were voluntary on the part of PacifiCorp supported by any others?

R. Yes. In addition to the WDEQ, a neutral arbitrator, after considering testimony and exhibits of PacifiCorp and others for seven full days in the Deseret Power/PacifiCorp arbitration matter, reached the following

conclusions, as reflected in Confidential UAE Exhibit RR 2.14, the Deseret Arbitration Final Award:

[redacted]

All of the above statements support my and the Arbitrator's conclusion that PacifiCorp embarked on a voluntary emissions control program that significantly overreached the legal requirements of the Clean Air Act.

Conclusion

Q. What are your ultimate conclusions after reviewing the Direct Testimony of Mr. Croft and PacifiCorp's data responses?

R. In the case of the scrubber upgrades at Hunter Units #1 and #2, Huntington Unit #1, and Dave Johnston Unit #3, PacifiCorp has committed to spend

hundreds of millions of dollars to install or upgrade pollution control equipment that achieve insignificant environmental benefits. These projects are clearly not cost-effective under any reasonable or recognized standard, and were clearly not required to meet BART or any other regulatory requirements of the Clean Air Act. Any attempt to characterize such projects as being required by air quality regulatory agencies or to meet Clean Air Act requirements is untrue and misleading. Utah ratepayers should not be asked to shoulder the burden of paying for environmental improvements that went well beyond meeting Clean Air Act standards and do not meet standard regulatory tests for the acceptable cost-effectiveness of environmental controls.

Q. Does this conclude your rebuttal testimony?

R. Yes.