BEFORE THE ENVIRONMENTAL QUALITY COUNCIL
STATE OF WYOMING

In the Matter of:	)	
Basin Electric Power Cooperative	)	Docket No. 10-2802
Air Quality Permit No. MD-6047	)	
BART Permit: Laramie River Station	)	

RESPONSE TO BASIN ELECTRIC'S MOTION FOR SUMMARY JUDGMENT

EPA Comment Letter dated 8/3/09

EXHIBIT 16

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
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Ref: 8P-AR

AUG 0 3 2009

David Finley, Administrator
Air Quality Division
Wyoming Department of
Environmental Quality
122 W. 25th St.
Cheyenne, WY 82002

Re: Proposed BART determinations for the following facilities: Basin Electric-Laramie River, PacifiCorp-Dave Johnston, Jim Bridger, Naughton, and Wyodak

Dear Mr. Finley:

We are writing in response to Wyoming's proposed Best Available Retrofit Technology (BART) determinations open for public comment until August 4, 2009. The BART determinations that we are commenting on include: Basin Electric Power Cooperative's Laramie River facility and PacifiCorp's Dave Johnston, Jim Bridger, Naughton , and Wyodak facilities. We have completed our initial review of the BART determinations and are providing our preliminary comments on the analysis below. Please note that we will only reach a final conclusion regarding the adequacy of Wyoming's BART determinations and Regional Haze SIP when we act on Wyoming's Regional Haze SIP revision through notice and comment rulemaking.

Modeling

1. A background ozone concentration of 44 parts per billion (ppb) was used for all electric generating unit (EGU) sources in the BART Calpuff modeling as the default value when actual ozone monitoring data were unavailable. This value appears to be too low based on typical annual average ozone levels measured at Wyoming ozone monitoring sites close to the facilities. For example, the Campbell County (Thunder Basin) monitor recently recorded annual average values ranging between 50 and 55 ppb, while the Sublette County, Jonah monitor, observed values of 55 to 58 ppb. The State should provide an analysis of how these higher ozone values would affect visibility and the modeling results.

2. It is not clear how the State considered large visibility benefits for nitrogen oxides (NO_x) controls in their determination, mainly in selecting low NO_x burners (LNB) and overfire air (OFA) as BART for sources instead of selective catalytic reduction (SCR). One example of this is the Laramie River analysis. Figure 9 in the analysis shows a

significantly lower impact at Wind Cave and Badlands National Park for control scenario 4 (SCR) compared to the less stringent NO_x control scenarios modeled. The SCR scenario cumulatively provides 25 fewer days of impairment at these parks and 1.5 delta-deciviews for all three units. This is a substantial improvement considering that the threshold level for considering a source subject-to-BART is 0.5 deciview. The State should provide an explanation of how visibility improvements were weighed in making the proposed BART determinations.

3. Deciview impacts are presented separately for each unit. However, it would be the cumulative impact of all units from a given power plant that would impact Class I area visibility. Tables should include total visibility impacts from all units at a facility as well as individual unit impacts. This will provide larger baseline impacts, but also larger visibility improvements. In the case of Naughton and Jim Bridger, it is possible that the impacts of all seven units will impact a Class I area at the same time. Consideration should be given to modeling all of these units together. It would also be helpful to have tables and figures that provide the improvement, in deciview, for all EGUs at a power plant.

4. Language for the draft BART determinations, such as the following from the Jim Bridger analysis, need further explanation: "The cumulative 3-year averaged visibility improvement from the baseline summed across the three Class I areas ..." (e.g., see page 49 of the Jim Bridger analysis). The State needs to provide clarification on the following: 1) Are deciview improvements calculated for each of the Class I areas added together?; 2) If so, what is the meaning of the number?; 3) Are three Class I areas sufficient to quantify the cumulative impact?; and 4) Were all Class I areas within 300 km considered?

NO_x Controls

5. Throughout the analysis, the most stringent emission control level for the control technologies has not been evaluated; resulting in inflated calculated cost effectiveness values. The BART Guidelines state that "It is not our intent to require analysis of each possible level of efficiency for a control technique as such an analysis would result in a large number of options. It is important, however, that in analyzing the technology you take into account the most stringent emission control level that the technology is capable of achieving. You should consider recent regulatory decisions and performance data *(e.g.,* manufacturer's data, engineering estimates and the experience of other sources) when identifying an emissions performance level or levels to evaluate." (see 70 FR 39166, July 6, 2005). Second, we disagree with the controlled rates presented in the BART analysis that could be achieved with SNCR and SCR. EPA estimates that SNCR can reduce NO_x by 40% - 50% for most large boilers ("EPA Air Pollution Control Cost Manual", 2002, Sixth ed., EPA-452-02-001, Section 4.2, Chapter 1, pg 1-3). EPA also estimates that SCR can reduce NO_x by 70% - 90%+ for most large boilers (EPA 2002, Section 4.2, Chapter 2, pg 2-3). In the recent decision in the Cinergy NSR lawsuit, SCR Best Available Control Technology (BACT) was determined to be 90% control. Even assuming 80% SCR control efficiency (in order to minimize ammonia slip), one gets a

controlled rate of less than 0.05 lb/MMBtu. PPL Montana has evaluated SCR at 0.06 lb/MMBtu and across the country there are many SCRs operating in the range of 0.03 – 0.04 lb/MMBtu. We therefore recommend that tighter emission limits be evaluated for both SNCR and SCR.

6. For all the sources, except Laramie River, there is no formula provided to calculate if the 12-month rolling emission rate has exceeded the NO_x ton per year (tpy) limits in the proposed permit conditions. A condition should be created for all sources to mirror condition 12.a.iii from page 50 the Laramie River Application Analysis proposed permit conditions.

Particulate Matter Controls

7. The conclusion section on BART control for particulate matter/particulate matter less than ten microns (PM/PM_{10}) should list the associated averaging periods for the lb/MMBtu, lb/hr, and tpy limits. The proposed permit conditions should also include the associated averaging period for all PM/PM_{10} limits.

8. The PM_{10} BART analyses assume that the lowest emission rate achievable by either a fabric filter (baghouse) or an electrostatic precipitator (ESP) is 0.015 lb/MMBtu. However, EPA has proposed that the Desert Rock power plant will meet a filterable PM_{10} limit of 0.010 lb/MMBtu (see Desert Rock Energy Center Proposed Permit, AZP 04-01). In addition, the current BACT determinations in Wyoming for new coal fired power plants are more stringent than the proposed PM BACT limit of 0.015 lb/MMBtu. Current BACT determinations indicate that new baghouses can achieve emissions in the range of 0.010lb/MMBtu to 0.012 lb/MMBtu. The BART determinations should include an analysis of ESPs and baghouses at a control level in the range of 0.010 lb/MMBtu to 0.012 lb/MMBtu.

9. Condition 5 in the proposed permits for all the sources contains an inappropriate exemption. BART is intended to be met continuously and should be a limit that effectively reflects proper operation of the BART control option. In general, a performance based (lb/MMBtu) limit would be necessary to assess the operational performance of a control device. Therefore, it is necessary that the exemption from the lb/MMBtu PM/PM_{10} limit during startup be removed from the permit. Performance based BART limits should be effective during all operational periods, including startup. In the event that a control option cannot achieve the level of control proposed as BART it may be appropriate to analyze the need for a startup BART limit (i.e., for an ESP controlled source). However, sources controlled with a baghouse should not need a separate startup BART limit due to the fact that baghouse control efficiency does not depend on the baghouse coming up to operating temperature.

10. Flue gas conditioning (FGC) is presented as a control option for PM. FGC is a low-cost option because it involves the injection of sulfur trioxide (SO_3) in the flue gas to make the PM more easily collectable by an ESP. We caution the Division that FGC must be

applied after flue gas desulfurization (FGD) is installed or upgraded, to assure that there is not a collateral increase in emissions of sulfuric acid mist. In the case of Naughton, there is projected to be an interim period when sulfuric acid mist emissions will exceed the PSD significance threshold. This increase is due to the operation of the FGC prior to FGD upgrades. For the purposes of BART a control option should not be considered as a BART option if it will result in increased emissions of visibility degrading pollutants (sulfuric acid mist).

Sulfur Dioxide Controls

11. The State correctly points out that since Wyoming proposes to be one of the four Section 309 states, BART sources' sulfur dioxide (SO_2) emissions would be regulated by the 2018 milestone under the backstop trading program when considering the impacts of these sources on Class I areas on the Colorado Plateau. However, for non-Plateau Class I areas, SO_2 controls need to be evaluated under 309(g) as part of the State's long-term strategy and reasonable progress goals. The State must include provisions in their SIP for establishing reasonable progress goals and must implement any additional measures needed to demonstrate reasonable progress for the Class I areas off the Colorado Plateau. (see 40 C.F.R. 51.309(g)(2)) The regulations provide that a state may take credit for and build upon the strategies implemented under Section 309 in its reasonable progress analysis, but the State must also provide a demonstration in its SIP of how the Section 309 strategies, including the backstop trading program, are meeting its visibility goals, and an analysis of whether other SO_2 controls are needed in order to meet reasonable progress. This means that stationary sources that are not required to implement SO_2 BART controls may still have to address SO_2 controls for the purposes of reasonable progress.

Wyodak

12. Due to a recent State-issued Prevention of Significant Determination (PSD) permit, Wyodak is required to install a new fabric filter for PM control. It is therefore inappropriate for the BART analysis options considered to be less protective than the permitted enforceable controls. Controls already permitted through PSD should be viewed as a baseline for control in the BART analysis. As mentioned above, the level of control achievable by new fabric filters is in the range of 0.010 to 0.012 lb/MMBtu, which is below the proposed level of 0.015 lb/MMBtu.

13. The control efficiencies assumed for NO_x technologies underestimate the capabilities of the technologies and therefore inflate cost effectiveness (see comment #6 above). The State should re-evaluate the cost effectiveness of NO_x controls. If the true control efficiencies of these technologies is considered, controlled lb/MMBtu rates and cost effectiveness ($/ton) will be reduced further from what is currently evaluated in the BART analysis. The reanalysis should indicate that SCR is cost effective at Wyodak.

Dave Johnston

14. On page 14 of the analysis, it states, "An ESP is an effective PM control device, as the existing units are already capable of controlling PM_{10} emissions from Unit 3 to 0.030 lb/MMBtu. The technology continually improves and is commonly proposed for consideration in BACT analyses to control particulate emissions from new PC boilers." This statement is not accurate. The current technology most often chosen to satisfy PM/PM_{10} BACT within Region 8 and Wyoming for new pulverized coal (PC) boilers of this size is a fabric filter or baghouse. The control efficiency of fabric filters is not dependent on temperature, which makes them a suitable control measure during periods of startup. An ESP must come up to temperature before becoming effective and may not be used during periods of fuel oil firing.

15. The control efficiencies assumed for NO_x technologies underestimate the capabilities of the technologies, and therefore inflate cost effectiveness values (see comment #6 above). The State should reevaluate the cost effectiveness of NO_x controls. If the true control efficiencies of these technologies is considered, controlled lb/MMBtu emission rates and cost effectiveness values ($/ton) will be much lower than evaluated in the BART analysis. Thus, we question the State's decision to limit BART controls to LNB/OFA without post combustion controls In addition, the State should take the large visibility improvement attributable to SCR into consideration in making the final BART determination.

16. It is not clear how Post-Control Scenario 3 and Post-Control Scenario B differ in Table 28. Both control scenarios seem to be LNB with advanced OFA, Dry FGD, Fabric Filter, and SCR. However, the impacts shown in Table 28 depict one less day above 0.5 dv for Post-Control Scenario 3 for 2003 data at Wind Cave NP, 2 fewer days for 2001 data at Badlands NP, and one fewer day using the 3-year average at Badlands NP. The State needs to provide an explanation of how the two scenarios differ and an explanation of how the difference affects the modeled impacts.

17. The Dave Johnson determination is missing the averaging period for the tpy NO_x limits in the proposed permit conditions. As we have stated previously, the State should include the averaging periods for all limits within the permit conditions.

Jim Bridger

18. The Calpuff visibility analysis showed the highest impacts at the Mt. Zirkel Wilderness area in Colorado, with lower impacts at the Bridger Wilderness area northwest of the plant. Given that the highest impacts from the facility seem to be focused on locations south and east of the Bridger plant, receptors should be also placed at the Flattops Wilderness area in Colorado to determine the level of visibility impairment at that location.

19. Insufficient information has been presented to warrant NO_x BART limits in excess of the NO_x presumptive BART levels. As shown in Table 1, NO_x emissions at Jim Bridger

Units 2 and 3 are under 0.22 lb/MMBtu, while Unit 4's emissions are somewhat higher at 0.26 lb/MMBtu. Unit 1 emissions in 2008 were 0.39 lb/MMBtu prior to the retrofitting of new controls. EPA presumptive BART is 0.15 lb/MMBtu if you assume the coal is sub-bituminous and 0.28 lb/MMBtu if you assume the coal is bituminous. It is not clear why all the units could not achieve 0.22 lb/MMBtu with LNB/OFA since two of the units are. All of Jim Bridger's units are identically sized nominal 530 megawatt (MW) tangential fired boilers, which should be able to meet nearly identical emission profiles and limits. We would like to point out that although PacifiCorp concluded that Jim Bridger's units cannot meet presumptive NO_x BART, the State has chosen to impose long term strategies that would reduce NO_x emissions to 0.07 lb/MMBtu, which is well below the presumptive level of 0.15 lb/MMBtu. This demonstrates the ability of Jim Bridger to meet a limit lower than the proposed BART limits of 0.26 lb/MMBtu.

20. The BART analysis must include an examination of greater levels of control for NO_x. The BART determination states, "Therefore, based on the cost of compliance and visibility improvement presented by PacifiCorp in the BART applications for Jim Bridger Units 1-4 and taking into consideration the logistical challenge of managing multiple pollution control installations within the regulatory time allotted for installation of BART by the Regional Haze Rule, the Division is requiring the installation of SCR on Jim Bridger Unit 3 in 2015 and on Jim Bridger Unit 4 in 2016 for the Long-Term Strategy of the Wyoming Regional Haze State Implementation Plan. The Division is also requiring PacifiCorp to submit a permit application to install additional add-on NO_x control on Units 1 and 2 that includes an analysis of: (1) the costs of compliance; (2) the time necessary for compliance; (3) the energy and non-air quality environmental impacts of compliance; and (4) the remaining useful life of existing sources that contribute to visibility impairment (i.e., the four statutory factors taken into consideration when establishing reasonable progress goals); and (5) the associated visibility impacts from the application of each proposed NO_x control. Each proposed add-on NO_x control shall achieve an emission rate, on an individual unit basis, at or below 0.07 lb/MMBtu on a 30-day rolling average. The permit application shall be submitted by January 1, 2015. Additional add-on NO_x control shall be installed and operational no later than the end of 2023 calendar year on Jim Bridger Units 1 and 2." (see page 55 of the Jim Bridger analysis). We wish to commend the State in its selection of SCR as the control technology for this source, but must point out that, as stated in comment #6 above, the BART guidelines require the consideration of the most stringent level of control of a technology under BART. If a limit of 0.07 lb/MMBtu is achievable by Jim Bridger Units 1 and 2, it needs to be included as the BART level of control, not postponed under reasonable progress.

21. Rotating Opposed Fire Air (ROFA) is considered as one of the NO_x control options, but it is not clear that this option is consistent with PacifiCorp's current permitting requirements to advanced LNB/OFA technology. Regardless, it does not appear to result in any additional control beyond what is currently being achieved on two of the units (0.22 lb/MMBtu). The other two proposed post-combustion control options, SNCR and SCR, could always be retrofitted after LNB/OFA. In the BART analysis for Jim Bridger, SNCR and SCR costs are higher for Unit 2 than for the other units, apparently because

new LNB/OFA is not assumed. The State should provide an analysis on why new combustion controls could not be applied.

22. The BART determination states that "The installation of SNCR and SCR could impact the saleability and disposal of fly ash due to higher ammonia levels, and could potentially create a visible stack plume sometimes referred to as a blue plume, if the ammonia injection rate is not well controlled." (see page 12 of the Jim Bridger analysis). The creation of a blue plume should not occur because control options must be maintained in accordance with good operating practices for minimizing emissions. If chosen as BART, any control option should be operated in a manner that maximizes control efficiency and minimizes collateral impacts. The fact that the injection rate may not be well controlled should not be a factor in eliminating SNCR, as modern plant data acquisition systems should facilitate the computation of an appropriate injection rate and location.

23. An explanation should be provided to address the difference in control of Units 1, 3, and 4 versus Unit 2. The control option "Existing LNB with separated OFA and SNCR" for Units 1, 3, and 4 is projected to reduce annual NO_x by 5,913 tpy while the reduction at Unit 2 is projected to be 1,420 tpy. We note that Jim Bridger has "four (4) identically sized nominal 530 MW tangential fired boilers..." and question why Unit 2 reductions should differ from reductions from Units 1, 3, and 4. (see page 3 of the Jim Bridger Analysis).

24. The option of SNCR was not carried forward to step 5 of the BART process, visibility analysis. The State should complete an analysis of improvements attributable to SNCR.

Laramie River

25. No additional controls for PM emissions from Laramie River were considered. We suggest that the State evaluate whether FGC would be a suitable low-cost control option on Laramie River. On PacifiCorp's units, this control option yielded significant emission reductions at a reasonable cost. If this option is considered, we caution that collateral emission increases should be avoided (please see comment #10 above).

26. Laramie River Units 1-3 are dry-bottom wall-fired boilers, currently emitting at approximately 0.27 lb/MMBtu, and burning sub-bituminous coal. They are all equipped with early generation LNB. EPA presumptive BART for such a boiler/fuel combination is 0.23 lb/MMBtu. Although three different cost tables are provided, one for each unit, they all appear to provide essentially an identical control level for the different control technologies. LNB, OFA, and a LNB/OFA combination are all evaluated as separate control options but it is not clear why the controlled rates are all the same (0.23 lb/MMBtu). One would expect differences, especially with the LNB/OFA combination, which should be lower than the other two options alone. In addition, the cost of LNB/OFA is much higher than on PacifiCorp's plants and the State should provide a reason for this difference.

27. The BART analysis must include an examination of greater levels of control for NO_x. The BART determination states, "Based on the costs and visibility improvement presented by Basin Electric in the BART applications for Laramie River Station Units 1-3, and taking into consideration the logistical challenge of managing multiple pollution control installations within the regulatory timeframe allotted for BART installations by the Regional Haze Rule, the Division is requiring the installation of additional controls under the Long-Term Strategy of the Wyoming Regional Haze State Implementation Plan. The Division is requiring Basin Electric submit a permit application to install additional add-on NO_x control that includes an analysis of: (1) the costs of compliance; (2) the time necessary for compliance; (3) the energy and non-air quality environmental impacts of compliance; and (4) the remaining useful life of existing sources that contribute to visibility impairment (i.e., the four statutory factors taken into consideration when establishing reasonable progress goals 5) and the associated visibility impacts from the application of each proposed NO_x control. Each proposed add-on NO_x control shall achieve an emission rate, on an individual unit basis, at or below 0.07 lb/MMBtu on a 30-day rolling average. Additional add-on controls shall be installed and operational on one of the Laramie River Station units by December 31, 2018 and on a second Laramie River Station unit by December 31, 2023." (see page 46 of the Laramie River Analysis). As noted with Jim Bridger, the BART guidelines require the consideration of the most stringent level of control of a technology under BART. If a limit of 0.07 lb/MMBtu is achievable at Laramie River, it needs to be included as the BART level of control, not postponed under reasonable progress.

Naughton

28. The Calpuff visibility modeling of the Naughton facility indicated maximum visibility impacts would occur in the Bridger Wilderness area. Given the relatively common incidence of winds from the north at Naughton, receptors should also be included at the Flattops Wilderness Class 1 area in Colorado to determine the level of visibility impairment at that location.

29. The control efficiencies assumed for all NO_x technologies underestimate the capabilities of the technologies and therefore inflate cost effectiveness (see comment #6 above). The State should re-evaluate the cost effectiveness of NO_x controls. If the true control efficiencies of these technologies is considered, controlled lb/MMBtu rates and cost effectiveness ($/ton) will be much lower than evaluated in the BART analysis. The reanalysis should indicate that SCR is cost effective at Naughton.

30. FGC will be applied to Naughton Units 1 and 2 and decommissioned from Unit 3 upon installation of a fabric filter permitting under PSD. The application of FGC prior to FGD upgrades will result in a PSD significant increase in sulfuric acid mist. This collateral increase should be avoided to maintain continuous visibility improvements at Class I areas impacted by Naughton.

We appreciate the opportunity to comment on these proposed BART determinations. If you have any questions, please contact Laurel Dygowski at (303) 312-6144.

Sincerely,

Callie A. Videtich, Director
Air Program