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File Code: 2580

Date: July 27, 2011

Mr. William Baumann  
Acting Director, Bureau of Air Management  
Wisconsin Department of Natural Resources  
101 S. Webster Street  
Box 7921  
Madison, WI 53707-7921

Dear Mr. Baumann:

On January 13, 2011, the State of Wisconsin submitted a draft implementation plan describing your proposal to improve air quality regional haze impacts at mandatory Class I areas across your region. We commented on that plan in a letter to Jonathon Loftus dated March 4, 2011. On July 1, 2011, we received a modified draft plan which included major revisions to the Best Available Retrofit Technology (BART) determination for the Georgia Pacific Broadway Mill in Green Bay. This letter contains our review of this plan. Cooperative efforts such as these ensure that together we will continue to make progress toward the Clean Air Act's goal of natural visibility conditions at our Class I wilderness areas and parks.

We appreciate the changes you made in the first draft to address some of our comments. Nonetheless we continue to have a number of concerns with the current draft plan and have attached technical comments to this letter that discuss them in detail. We look forward to your response to our comments as required by 40 CFR 51.308(i)(3). For further information, please contact Eastern Region Air Resource Specialist Trent Wickman at (218) 626-4372.

Again, we appreciate the opportunity to work closely with the State of Wisconsin. The Forest Service compliments you on your hard work and dedication to significant improvement in our nation's air quality values and visibility.

Sincerely,

*/s/ James W. Sanders*  
JAMES W. SANDERS  
Forest Supervisor

Enclosure

cc: Jonathon Loftus  
Pat Brewer  
Don Shepherd  
Tim Allen



John Summerhays  
Charles E Sams  
Paul Strong  
Dale Higgins  
Bret A Anderson

## **USDA Forest Service Technical Comments on the Regional Haze State Implementation Plan (RH SIP) for Wisconsin**

We appreciate the significant resources devoted by the State of Wisconsin (WI) in developing their RH SIP and responding to some of our comments made on the first draft. The projected emissions reductions in the RH SIP are an important first step toward improving visibility and other air quality related values at the affected Federal Class I areas. We have some concerns with the lack of technical analysis and some of the conclusions made in the RH SIP. These concerns are outlined below.

### **General Comments**

1. On page 7 Wisconsin appears to believe that if it did not significantly contribute to visibility impairment in a Class I area it would not be subject to the Regional Haze Rule. Wisconsin is subject to the Regional Haze Rule either way, see 40 CFR 51.300(b)(3).
2. On page 11 it is stated “Natural conditions are defined as the level of visibility seen for the least impaired days.” This definition of natural conditions is not accurate, they were estimated from the distributions of pollutants measured during the baseline scaled to estimates of annual average natural conditions made by Trijonis<sup>1</sup>.

### **Best Available Retrofit Technology (BART)**

3. Page 18 discusses the 2018 “on the books” emission inventory which included estimated BART controls for five non-electrical generating units (EGUs) in Wisconsin. Please include what controls were specified for these units and at what control efficiency.
4. Page 19 concludes that “Accounting for the lower EGU emissions projected in Case B (Table 4) – along with the higher projected non-EGU emissions – is expected to produce more beneficial visibility results than on-the-books controls alone modeled in Case A” We find this conclusion hard to accept without modeling to support it. Emission reductions at sources close to Class I areas were traded for statewide reductions. As you know, the impact of each ton of emissions close to the Class I Areas is higher than those further away.
5. We strongly support Wisconsin’s previous determination of BART for the boilers at the Georgia Pacific (GP) plant in Green Bay. We believe the previous determination is well supported by the technical documentation prepared and submitted for our review and as part of the permitting process. The new proposal will result in approximately 3228 less tons of sulfur dioxide (SO<sub>2</sub>) and 366 less tons of nitrogen oxides (NO<sub>x</sub>) removed. The following are components of Wisconsin’s determination that should be changed:

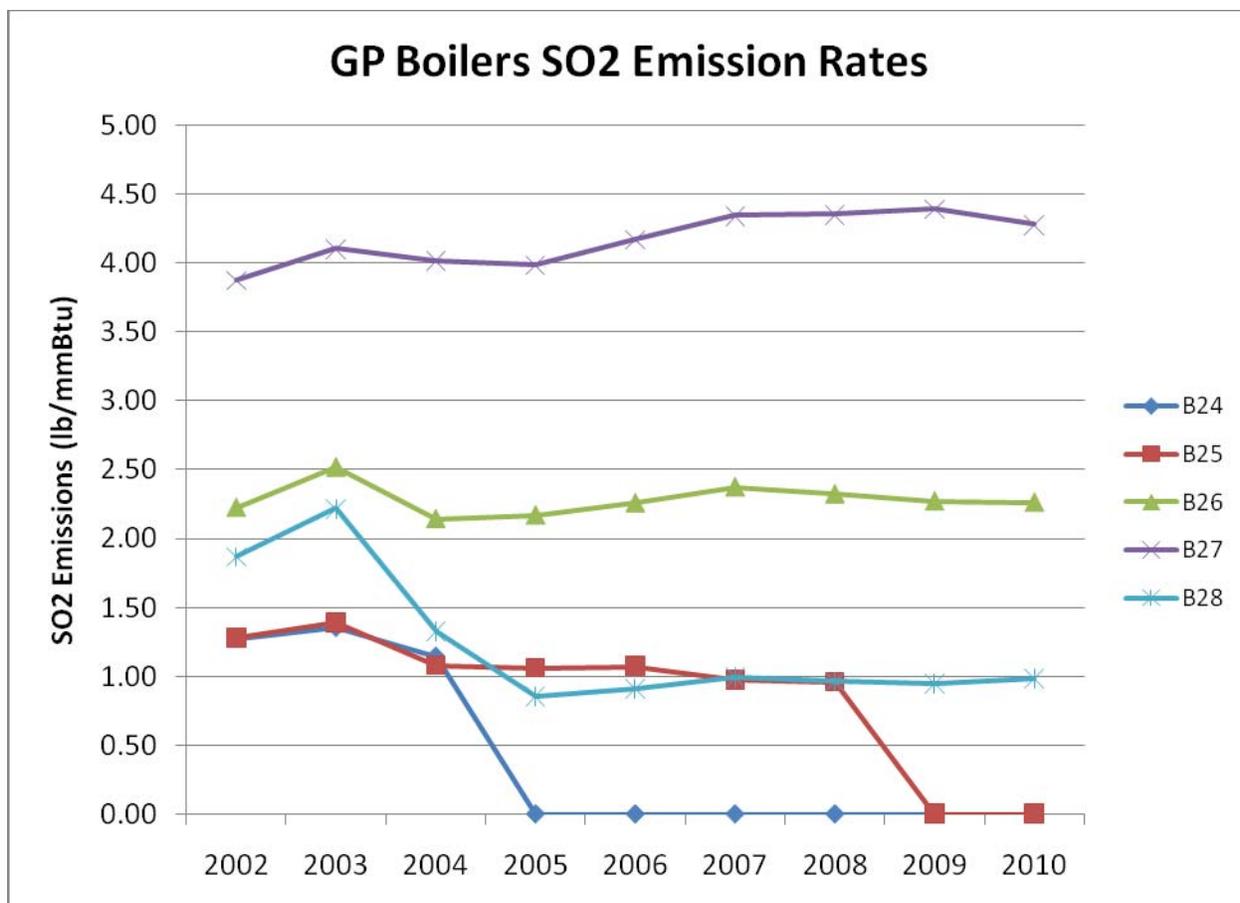
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<sup>1</sup> Copeland, S. A., Pitchford, M. L., and Ames, R. B. 2008. Regional haze rule natural level estimates using the revised IMPROVE aerosol reconstructed light extinction algorithm. Presented at the Air & Waste Management Association Visibility Specialty Conference, Moab, April 2008.

- a. Selection of 93% SO<sub>2</sub> control efficiency - Wisconsin determined that the technology can achieve 95% control efficiency, but that long term operation and compliance is represented by 93% control efficiency. The entire justification for this adjustment is based on data from the AES Greenridge facility in North Carolina, where a ~1.5% reduction (from ~ 96.8% to ~ 95.3%) in control efficiency was documented due to boiler load swings. Wisconsin fails to note that the control efficiency from AES that already includes the load swings is the 95% figure cited. It appears to be double counting to remove an additional 2% from the 95%. All other examples in Table 2.1 show removal efficiencies of at least 95% or they involve units that have
  - significantly lower pre-controlled levels of SO<sub>2</sub> compared to GP making achievement of 95% control more difficult, and/or
  - are significantly older installations
  
- b. Adjustment of baseline SO<sub>2</sub> emissions. We understand that the State BART rule incorporates the EPA BART guidelines (FR Vol 70, No 128, pg. 39104-39172). The BART guidelines state “the baseline emissions rate should represent a realistic depiction of anticipated annual emissions for the source. In general, for the existing sources subject to BART, you will estimate the anticipated annual emissions based upon actual emissions from a baseline period.” Actual emissions of SO<sub>2</sub> for the baseline period are 12,903 tons. Wisconsin “determined that actual SO<sub>2</sub> base year emissions do not fully represent the appropriate basis for established BART SO<sub>2</sub> emission limitations.” Additional supporting points included were the need to:
  - i. consider existing conditions
  - ii. evaluate applicable fuels and the variability that may occur in emission levels
  - iii. account for switching to low sulfur content fuels as compared to coke and high sulfur bituminous coals

“As a result, the Department determined that SO<sub>2</sub> base year emissions (uncontrolled) should reflect a "base" fuel consistent with boiler design and operation. In addition, that the sulfur content of the base fuel should reflect fuels that are reasonably obtainable on a long-term consistent basis.” The net result of this approach inflates the baseline SO<sub>2</sub> emissions from 12,903 tons to 15,932 tons.

We believe the inflation of the baseline emissions is without support in the BART guidelines. In addition it is unclear how the hypothetical baseline operating scenario proposed by Wisconsin addresses the issues stated (i-iii above). For example, if representing existing conditions is the concern, then emissions from boilers B24 and B25 would not be included in the baseline, since they have not been run for many years. The second issue suggests that there is emission variability due to fuel switching, but the following graph from data provided by Wisconsin shows little variability other than the shutdown of boilers B24 and B25.



We find no support in the BART guidelines for inflating baseline emissions to account for a control option such as adjusting fuels. We see no reason why the baseline needs to be adjusted to assess the affect of adjusting fuels.

- c. The inflated baseline is then used in combination with the low control efficiency as the basis from which to set emission limits. Such an approach leads to “paper” reductions. Based on 2010 operating data, the effective emission rate on the BART boilers that results from the proposed mass cap limit of 5800 tons SO<sub>2</sub> per year is 1.6 lb/MMBtu. This results in an actual control efficiency of about 56% for the BART boilers. This is in stark contrast to the proposed value of 93% or the 95% value we support. This dilution of the BART limit is not allowed in the BART guidelines. They state – “You should consider allowing sources to “average” emissions across any set of BART-eligible emission units within a fenceline, so long as the emission reductions from each pollutant being controlled for BART would be equal to those reductions that would be obtained by simply controlling each of the BART-eligible units that constitute BART-eligible source.”
- d. The original NO<sub>x</sub> control efficiencies were 84% and 94% for boilers B26 and B27 respectively. These were downgraded to 68% and 84% for boilers B26 and

B27 respectively in the amended BART determination. The following adjustments were made to the previous determination:

- i. The combination of inappropriate adjustments that led to the inflated SO<sub>2</sub> limit is used here as leverage to argue that the resulting higher SO<sub>2</sub> concentrations will cause problems for the regenerative selective catalytic reduction (RSCR) system. We note that the original BART stack limit of 0.58 lb/MMBtu would not have this issue. The proposed difficulty is predicated on the SO<sub>2</sub> scrubber running at artificially low removal efficiencies - approximately 67% control efficiency based on the proposed SO<sub>2</sub> limit of 1.01 lb/MMBtu or 50% control efficiency based on the proposed 30-day rolling limit of 1.55 lb/MMBtu. This is in stark contrast to the ability of the technology to remove in excess of 95% of the inlet SO<sub>2</sub>. Please set the SO<sub>2</sub> limit to reflect the capabilities of the scrubber.
  - ii. It is our understanding that the emissions from all the boilers come into a common header before being split into two parallel flues. The discussion in the amended BART determination which assigns one flue to one boiler is theoretical. The flues could just as easily be combined if necessary. In the proposal submitted by Babcock they give estimates for a parallel system of two turbosorb units and two RSCR systems but stress that “Although not presented herein, BPEI does suggest further consideration of a single train DFGD design as the most cost effective AQCS solution for this site. While critical moving components, such as fans, could remain redundant, the large major components such as the turbo reactor and baghouse could easily be designed to carry 100% of the design flue gas flow, and at significantly reduced capital and installed cost.”
  - iii. The assumed control efficiency for RSCR was dropped 75% to 70% to allow for a “compliance margin.” Please comment why a compliance margin is needed now when it was not previously. It is our understanding that the quote provided by the manufacturer already includes consideration of uncertainties with the system.
  - iv. We continue to believe an RSCR system should be installed for the BART units per the previous determination.
- e. Compliance – Wisconsin proposes both emission rate and mass emission limits. We are unaware of any basis in the BART guidelines for mass emission limits.
- i. The 12 month mass cap is viewed as being consistent with achieving a “long-term average BART level of control.” We are unaware of any long-term level of BART control specified in rule or guidance. Visibility is perceived instantaneously so emission limits established to improve visibility should be short term.
  - ii. The 30 day limit is calculated by applying the inflated emission SO<sub>2</sub> rate (see comment c. above) to the max daily heat rate value and multiplying by 30 days. Why not instead find the highest 30-day block value or the average 30-day block value over the baseline period? The proposed approach leads to an inflated mass cap.

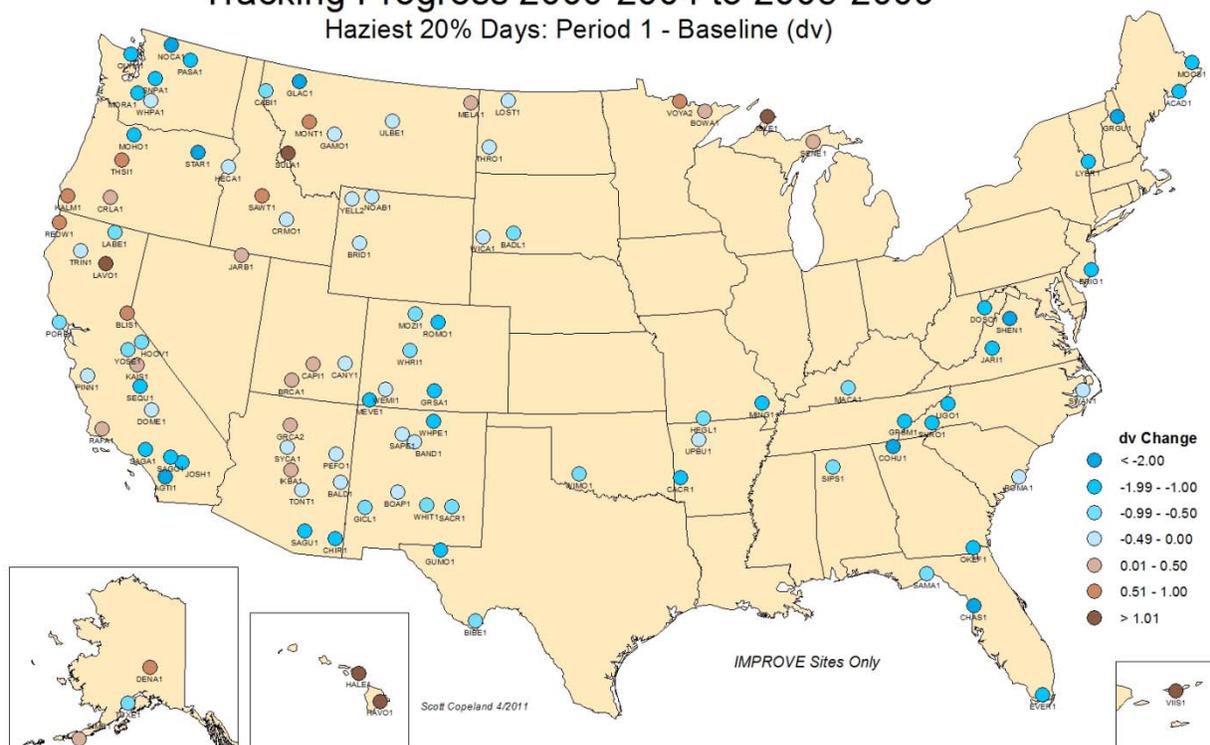
- iii. Interpollutant trading – we are unaware of any basis in the BART guidelines for interpollutant trading. This option when used in combination with the inflated SO<sub>2</sub> emission limits and mass caps could allow GP the real possibility of not installing any NO<sub>x</sub> controls at all by “over-controlling” SO<sub>2</sub> from boilers B26 and B27 through the application of a scrubber. The previous BART determination prescribed both a scrubber *and* RSCR for NO<sub>x</sub> controls.

### **Reasonable Progress/Long Term Strategy**

6. On page 27 Wisconsin appears to believe that the Boundary Waters Canoe Area Wilderness (BOWA) and Voyageurs National Park (VOYA) meet the uniform rate of improvement (URI, also known as the URP - uniform rate of progress). This conclusion was based on one of the MRPOs modeling runs (using a 2005 base year). The State of Minnesota in setting the reasonable progress goal (RPG) for 2018 in their RH SIP looked at numerous predictions of visibility in 2018. The MPRO 2005 base year run was the only one that showed BOWA below the URP. Minnesota ended up setting the RPGs for both of its Class I areas above the URP due to uncertainties with the different modeling runs. Therefore it is incorrect to say that BOWA and VOYA meet the URP.
7. On the same page Wisconsin appears to assume that if a Class I areas is below the URP the four factors at 40 CFR 51.308(d)(1)(i) do not apply. We understand that all the factors, including the comparison to the RPG, apply. Please correct this section.
8. Analysis of recent visibility data shows that in the eastern US only the Northern Class I Areas have degraded since the baseline period (see figure below from upcoming IMPROVE Report). This means the amount of work to achieve the RPGs has increased. Please note this in the SIP.

## Tracking Progress 2000-2004 to 2005-2009

Haziest 20% Days: Period 1 - Baseline (dv)



- On page 31 Wisconsin states “Additional information developed by the MRPO process supports the previous conclusions that the existing control programs and BART meet the RPG requirement through 2018.”

Wisconsin goes on to cite the EC/R “Factor” study as supporting its conclusion. We disagree. The EC/R study looked at controls beyond existing levels and concluded that additional controls on EGUs and ICI boilers are feasible. Page 101 of the report concluded that “Most of the projected cost-effectiveness values for potential additional controls (Table 6.1-1) are within the range of cost-effectiveness values estimated for on-the-books controls (Table 6.1-2).”

No facility-specific cost analyses were presented in the SIP to counter the claims of the EC/R study.

- Reasonable progress examines all sources with potential impacts to the Class I areas for the applicability of pollution controls regardless of their BART status. A number of States across the United States have installed controls on sources under reasonable progress. In the most recent draft RH SIP you identify a list of sources expected to have the largest visibility impact. In Tables 8A and 8B you indicate what is known regarding plans for additional pollution controls at each listed facility. For those sources where controls are not being proposed, please comment whether cost effective controls are nonetheless available. As we commented previously, we are especially interested in the

numerous industrial boiler sources (e.g. Thilmany, PCA-Tomahawk, Stora Enso, etc). It is our understanding that many of these sources burn a high sulfur fuel and have little or no sulfur controls, in which case cost effective controls should be easily identified. Please provide the boiler type and size, fuel(s), and the presence of any pollution controls for each source in Tables 8A and 8B.

11. We believe that the regional haze rule requires that the sources in Tables 8A and 8B be studied under the reasonable progress/long term strategy portion of the rule and controls required with this RH SIP. We do not agree that the application of controls on these sources is dependent on a new modeling run and/or whether the Northern Class I areas are predicted to meet the URP line. The URP line is just one of the factors to consider in the evaluation of controls - it does not trump the others.
12. Please include the following statement concerning the EC/R study that was deleted from the first draft of the RH SIP “EC/R concluded that the “EGU-1” reductions in SO<sub>2</sub> for the 3-state region (based on IPM Version 2.1.9) could be sufficient to reach the glide-path line at Isle Royale National Park and Seney Wilderness Area (northern Michigan) and Boundary Waters Canoe Wilderness Area (northern Minnesota), but that additional control measures would likely be needed to reach the glide path line for Voyageurs National Park (northern Minnesota).” This shows that the nearest states can achieve the URP if they choose to do so.
13. Please share the page number in the EC/R report for this conclusion, we cannot find it - “Another portion of the EC/R analysis showed that additional progress in visibility for Seney and Isle Royale is limited by the time necessary for compliance rather than potential control levels and cost.”
14. The mere existence of future rules affecting the same sources (e.g. 1-hr NAAQS, or industrial boiler MACT) does not preclude the application of the Regional Haze Rule. If the existence of future rules precluded the application of current rules, then no regulations would ever be applied. In the response to comments section of the BART determination for Georgia Pacific, Wisconsin supports this idea when it states (Page 112) “The Department cannot anticipate or regulate based on *future* potential requirements.” If the order was different would Wisconsin delay the implementation of, for example, the 1-hr SO<sub>2</sub> NAAQS because the Regional Haze Rule was due in a year? Also just because EPA needs more time to evaluate the entire fleet of ICI boilers across the US does not mean Wisconsin should delay control determinations for its handful of highest visibility-impacting industrial boilers under reasonable progress/long term strategy.
15. Page 34 “...the states will not be able to implement deeper emission reductions more rapidly than current regulatory program efforts.” We are curious what Wisconsin thinks the Regional Haze Program is if it is not a “current regulatory program effort”?
16. Page 34 – “Since the time for compliance is a limiting step the consideration of the other RPG factors is not evaluated for this RPG determination.” As stated above we do not

agree that the time for compliance is a limiting step. We also do not agree that one of the four factors can prevent evaluation of the others. Please evaluate all the factors.

17. Page 35 - “Of the five MWPO states, Michigan and Minnesota have higher contribution to Seney and Isle Royale compared to Wisconsin.” This is contradicted by Table 1 in the draft RH SIP.

18. With respect to the September 19, 2007 letter sent by the State of Minnesota asking for specific emission reductions. A quote from this letter follows.

“In particular, Minnesota asks Iowa, Missouri, North Dakota, and Wisconsin to evaluate further reductions of SO<sub>2</sub> from electric generating units (EGU) in order to reduce SO<sub>2</sub> emissions by 2018 to a rate that is more comparable to the rate projected in 2018 for Minnesota, approximately 0.25 lbs/MMBtu. Minnesota believes that Illinois is already in the process of meeting this goal. Emission reductions in Wisconsin are particularly important, as Wisconsin is the highest contributor outside Minnesota to visibility impairment in Minnesota’s Class I areas.”

Wisconsin estimates that it will achieve 0.29 lb/MMBtu by 2014, based largely on its CATR budget. Actual emissions in 2014 could exceed the budget due to banked allowances. What will Wisconsin commit to do if it does not meet Minnesota’s requested rate of 0.25 lbs/MMBtu in 2018?

19. Page 38 - “ICI boilers were also reviewed by EC/R, and showed potentially reasonable additional controls on a cost basis. WDNR may use results from the EC/R study for reasonable controls for ICI boilers – should Wisconsin’s long-term strategy be determined to be insufficient – with a focus on the significant emission sources in Tables 8A and 8B in the Reasonable Progress Goals section.” We agree with this statement except that we believe the determination of reasonable controls for these sources should be included in this SIP.

20. Page 39 - “The MRPO TSD shows that the reasonable progress goals for the Northern Class I areas in northern Minnesota (Boundary Waters and Voyageurs) will be achieved by 2018 from implementation of “on the books” and “will do” control measures in the states contributing to visibility impairment,…” Minnesota felt the need to ask for emission reductions from Wisconsin because the projected reductions were not enough to achieve its RPG. Please clarify this statement.