



United States Department of the Interior



FISH AND WILDLIFE SERVICE
National Wildlife Refuge System
Branch of Air Quality
7333 W. Jefferson Ave., Suite 375
Lakewood, CO 80235-2017

IN REPLY REFER TO:

September 15, 2008

N3615 (2350)

David Finley, Administrator
Air Quality Division
Wyoming Department of Environmental Quality
122 W. 25th St.
Herschler Bldg. 4 W
Cheyenne, Wyoming 82002

Dear Mr. Finley:

The U. S. Fish and Wildlife Service (FWS) and the National Park Service (NPS) are in receipt of two Best Available Retrofit Technology (BART) determinations developed for the FMC Wyoming Corporation, Westvaco Facility and the General Chemical Green River Works, along with the Wyoming DEQ analysis of each BART determination. We have completed a preliminary review, and provide comments in the enclosures to this letter regarding the BART determinations for these facilities. The BART permit process is not a substitute for the Regional Haze SIP adoption and review process, and we may have additional comments during the public comment period. A 60-day consultation period on the RH SIP revision should be provided to the Federal Land Managers (FLMs) prior to a public hearing.

We are also in receipt of company-developed BART proposals for eleven Electric Generating Units in Wyoming. Since we do not yet have the Wyoming DEQ analysis of these BART proposals, we are not commenting on those at this time. We respectfully request that the FLMs receive a 60-day comment period after the DEQ analyses become available.

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We appreciate your efforts in managing and reviewing the BART program for Wyoming, and we thank you for the opportunity to comment. Please accept an invitation to discuss our comments by conference call as necessary at your convenience. If you have any questions on these comments, please contact Tim Allen (FWS) at (303) 914-3802, or Bruce Polkowsky (NPS) at (303) 987-6944.

Sincerely,



Sandra V. Silva, Chief
FWS Branch of Air Quality

Sincerely,



for Christine L. Shaver, Chief
NPS Air Resources Division

Enclosures (2)

cc:

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Enclosure 1
Comments on Two Wyoming BART Determinations
FMC Wyoming Corporation, Westvaco Facility, Boilers #4, #6 and #7
September 15, 2008

The BART determination was generally well developed. Boiler #4 is a gas-fired boiler that has a NO_x emission limit of 0.23 lbs/mmBtu and these emissions are restricted through "combustion air control." Coal-fired boilers #6 and #7 are currently controlled with "combustion air control" for NO_x, a wet alkaline scrubber for SO₂ and particulate matter (with a 50% flue gas bypass) and an electrostatic precipitator (ESP) for particulate matter.

Analysis was provided for SO₂ control alternatives in Table 5-2 of the Best Available Retrofit Technology Analysis for Sources Subject to BART, FMC Wyoming Corporation's Westvaco Facility, dated March 5, 2007 (FMC's BART determination). Option 1, Scrubber Upgrade (\$1,066,982 Annual Cost, 6,993.2 tons of SO₂ reduced, \$183/ton, \$10,564,176/deciview) was compared to Option 2, Scrubber Upgrade & Stack Reheat (\$3,513,039 Annual Cost, 5,827.6 tons of SO₂ reduced, \$502/ton, \$8,344,510/deciview). Ultimately, FMC selected, and the Wyoming DEQ agreed to Option 1 as BART. However, the BART Guidelines state that "... large capital costs for a control option alone would not preclude selection of a control measure if large emissions reductions are projected. In such a case, low or reasonable cost effectiveness numbers may validate the option as an appropriate BART alternative irrespective of the large capital costs."¹ In this context, Option 2 (even though the annual cost is higher than Option 1) delivers a cost effectiveness of only \$502/ton. This cost-effectiveness is considered very reasonable when compared to all other BART reviews performed by the Federal Land Managers (FLMs).² Two examples are:

- Tennessee Eastman in Kingsport, TN, has proposed to add SO₂ scrubbers at a cost of \$3,000 - \$4,000 per ton to reduce impacts on visibility at Great Smoky Mountains National Park.
- Georgia Pacific in Big Island, VA, has proposed to add SO₂ scrubbers at a cost of \$4,000 per ton to reduce impacts on visibility at the James River Face Wilderness Area.

In terms of cost-effectiveness relative to visibility improvement (\$/dv), Option 2 also meets that criterion at \$8,344,510 per deciview. This value is considered reasonable given that Great River Energy is proposing to add a dry scrubber/baghouse combination to reduce SO₂ at its Stanton Unit #1 in North Dakota with a cost-effectiveness of improving visibility at Theodore Roosevelt National Park of \$14.8 million/dv. Therefore, the FLMs propose that the most reasonable assumption is the adoption of Option 2 as BART for SO₂.

Regarding SO₂ the Wyoming DEQ did not require FMC to install controls, but required that it participate in the Western Backstop Sulfur Dioxide Trading Program. The Bridger Wilderness Area is not one of the 16 Colorado Plateau Class I Areas considered by the Grand Canyon Visibility Transport Commission to be under this trading program. Therefore, SO₂ controls of the Section 309 sources should be evaluated and documented as to the effects on the Section 308 areas.

The FLMs' analysis for a NO_x control alternative (based on Table 6-3 of FMC's BART determination) is similar to the above discussion for SO₂. NO_x Option 1, Low NO_x Burners

(LNB) with Over-fire Air (OFA) (\$826,290 Annual Cost, 3,418.8 tons of NO_x reduced, \$242/ton, \$2,582,157/deciview) was compared to Option 2, LNB/OFA & SNCR (\$2,563,703 Annual Cost, 3,807.2 tons of NO_x reduced, \$673/ton, \$6,818,358/deciview). Ultimately, FMC selected Option 1 as BART and the Wyoming DEQ agreed. Again, the BART Guidelines³ provide that the most inexpensive alternative should not necessarily be the chosen alternative. As long as a control alternative that delivers additional visibility benefits remains within a cost-effective range, that alternative may be validated as being BART. Option 2 delivers a very reasonable cost effectiveness of \$673/ton. In presenting reasonable ranges for cost-effectiveness the preamble to the BART Guidelines states that the presumptive NO_x limits for large EGUs range from \$100 - \$1,000 per ton.⁴ Although the FMC boilers are not affected by the presumptive limits for large Electric Generating Units (EGUs), the cost structure presented in the preamble might be generally less expensive on a cost per ton basis than would be expected for smaller boilers. In terms of cost-effectiveness relative to visibility improvement, Option 2 at \$8,344,510 per deciview is believed by the FLMs to be reasonable. Therefore, the FLMs propose that the most reasonable assumption is the adoption of Option 2 as BART for NO_x.

The procedure outlined in the BART Guidelines demonstrates control alternatives for a *single* pollutant being compared in order to determine the most cost-effective control for that given pollutant. The value of using single pollutant analysis comes from the universe of cost data available for comparison purposes. FMC's BART determination in Table 7-6 developed combinations of SO₂ and NO_x control alternatives (Alternatives 1 - 4). As noted above there is no provision in the BART Guidelines to analyze control alternatives by creating composite costs for various combinations as a means to make the ultimate BART selections. Nevertheless, even Alternative 4 (Scrubber Upgrade with reheat, LNB/OFA/SNCR) can be accomplished for \$563/ton⁵ and \$8,256,442/deciview. Those cost-efficiencies fall within a reasonable range as provided in the BART Guidelines as discussed above. Therefore, the FLMs propose that the most reasonable assumption is the adoption of Alternative 4 as SO₂ and NO_x BART (which is a combination of the SO₂ and NO_x choices noted in the above two paragraphs), especially if visibility impacts on both the Bridger and Fitzpatrick Wilderness Areas are considered.

The next-to-last paragraph of Section 7.2 of FMC's BART determination compares visibility improvement of the control alternatives to 0.5 deciviews in an effort to marginalize the visibility improvement projected to result from those control alternatives. The Wyoming DEQ embraces this line of thinking in its proposed BART Determination. This is a misuse of the Division's own guideline value of 0.5 deciviews. This value is used only to confirm that a BART-eligible facility "contributes" to visibility impairment (defined as a visibility impact greater than 0.5 deciviews at a Class I area) so as to become subject to perform a BART determination.⁶ It is inappropriate to use the value to evaluate the perceptibility of visibility improvement due to installation of control equipment.

Specifically, the last paragraph of Section 7.2 of FMC's BART determination asserts that there would be "no perceptible difference" between Alternative 1 and Alternative 4 in terms of visibility improvement at the nearest Class I area and again the Wyoming DEQ supports this position. It is incorrect to dismiss a control strategy on the basis that the resulting improvement is not perceptible or significant. EPA states in the preamble to its BART Guidelines that, "Even though the visibility improvement from an individual source may not be perceptible, it should still be considered in setting BART because the contribution to haze may be significant relative

to other source contributions in the Class I areas. Thus, we disagree that the degree of impairment should be contingent upon perceptibility. Failing to consider less-than-perceptible contributions to visibility impairment would ignore the CAA's intent to have BART requirements apply to sources that contribute to, as well as cause, such impairment."⁷ Regional haze is a cumulative regional issue with numerous sources contributing to the overall level of haze and therefore controls on a single source cannot be expected to resolve the haze issue. Nevertheless, small increments of visibility improvement at cost-effective rates from multiple sources will result in cumulative visibility improvement. This misinterpretation led the Wyoming DEQ to propose only combustion controls as BART, even though SNCR remains to be a cost-effective alternative as discussed above.

FMC states that three percent or less of the light extinction at the Bridger Wilderness Area is due to emissions from gas-fired boiler #4 (see Table 3-4) and for this reason a BART determination was not performed. There is no exemption in the BART Guidelines from performing a NO_x BART determination for this unit. Section 2.1 of the FMC BART determination is not specific in describing the "combustion air control" existing on this unit and the NO_x control efficiency is not stated. Cost-effective NO_x combustion control alternatives can often be installed and they should be analyzed in this BART determination.

¹ See 40 CFR Part 51, Appendix Y. The U.S. Environmental Protection Agency finalized its BART Guidelines on June 15, 2005, and published the preamble and final rule text in the Federal Register on July 6, 2005. The rulemaking action added Appendix Y to Part 51, titled "Guidelines for BART Determinations Under the Regional Haze Rule." See Section IV.D.4.STEP 4.g.

² The term "Federal Land Managers" and acronym "FLMs" refer to the U. S. Fish and Wildlife Service and the National Park Service, the Department of the Interior agencies tasked with protection of Clean Air Act-designated Class I areas.

³ See reference #1, above.

⁴ Ibid., See the Preamble to 40 CFR Part 51, Appendix Y found in the Federal Register, Volume 70, No. 128, Wednesday, July 6, 2005, Section III.E.6.d.

⁵ Calculated by the reviewer, noting the caveat that the combination of tons of NO_x and SO₂ may introduce an artifact. However, it may be accurate enough for examining the magnitude of the cost numbers.

⁶ See 40 CFR Part 51, Appendix Y. The U.S. Environmental Protection Agency finalized its BART Guidelines on June 15, 2005, and published the preamble and final rule text in the Federal Register on July 6, 2005. The rulemaking action added Appendix Y to Part 51, titled "Guidelines for BART Determinations Under the Regional Haze Rule." See Section III.A.1.

⁷ Ibid., See the Preamble to 40 CFR Part 51, Appendix Y found in the Federal Register, Volume 70, No. 128, Wednesday, July 6, 2005, Section III.E.4.

Enclosure 2
Comments on Wyoming BART Determinations
General Chemical Soda Ash Partners, Green River Works Boilers C&D
September 15, 2008

At this facility two coal-fired boilers C and D are subject to BART. The boilers are currently controlled with electrostatic precipitators (ESP) for control of particulate matter, over-fire air for control of NO_x and no controls for SO₂. The costs of control alternatives were determined from estimates provided by equipment vendors Alstrom Power and Allied Environmental Solutions. The cost-effectiveness of BART control alternatives was seemingly judged against estimates provided by EPA in the BART Guidelines,¹ and in most cases controls were deemed as being too expensive and not being cost-effective. The BART Guidelines require that cost estimates be developed using the EPA OAQPS Control Cost Manual.² Only in this way can national, uniform comparisons be made. The BART Guidelines state, "The basis for equipment cost estimates also should be documented, either with data supplied by an equipment vendor (i.e., budget estimates or bids) or by a referenced source (such as the OAQPS Control Cost Manual...). In order to maintain and improve consistency, cost estimates should be based on the OAQPS Control Cost Manual, where possible. The Control Cost Manual addresses most control technologies in sufficient detail for a BART analysis. The cost analysis should also take into account any site-specific design or other conditions identified above that affect the cost of a particular BART technology option."³ Although it is understood that the subject boilers are not Electric Generating Units (EGUs) above 200 MW, the preamble to the BART Guidelines in discussing cost ranges states, "...the majority of BART eligible units greater than 200 MW can meet the presumptive BART limit at a cost of \$400 to \$2000 per ton of SO₂ removed. . . Dry FGD cost effectiveness data ranged from \$393 to \$2132 per ton SO₂ removed, with an average cost effectiveness of \$792 per ton."⁴ The cost ranges for Dry Flue Gas Desulfurization (Dry FGD) (\$2,200 for D and \$3,200 for C) presented in General Chemical's BART analysis are not far above the these upper values, even after factoring in supplemental re-construction costs (\$474k). Also, recalculating costs downward by reflecting Control Cost Manual guidance and possible upward adjustment in the EPA EGU cost ranges for less cost-efficient smaller boiler units, may further make the costs more reasonable. This cost-effectiveness may be considered reasonable when compared to all other BART reviews performed by the Federal Land Managers (FLMs).⁵ Two examples are:

- Tennessee Eastman in Kingsport, TN has proposed to add SO₂ scrubbers at a cost of \$3,000 - \$4,000 per ton to reduce impacts on visibility at Great Smoky Mountains National Park.
- Georgia Pacific in Big Island, VA has proposed to add SO₂ scrubbers at a cost of \$4,000 per ton to reduce impacts on visibility at the James River Face Wilderness Area.

Please re-develop the cost estimates as indicated above and resubmit the analysis.

General Chemical included a \$4.8 million cost for a new stack if SNCR or SCR is installed. While that may be valid for SCR due to space constraints, we cannot determine why it would be necessary for installation of SNCR, which is contained within the boilers. Since this cost represents well over half of the total Capital Investment for SNCR, a thorough justification is necessary. The Wyoming DEQ used the General Chemical cost figures to conclude that SNCR

was not economically feasible. It is suggested that General Chemical re-calculate the SNCR costs without the stack replacement cost.

General Chemical inflated its scrubber costs by underestimating the effectiveness of the SO₂ scrubbing options evaluated (90% for Wet FGD and 80% for Dry FGD) and by overestimating the operating costs by using a part of the EPA OAQPS Control Cost Manual that does not apply to acid gas scrubbers. The analysis should be re-calculated using correct scrubbing effectiveness assumptions and cost calculation procedures. The corresponding reduced costs should be reported.

Section 6 develops various combinations of NO_x and SO₂ controls (Options 6 - 11) for development of the least-cost envelope for visibility impairment. The procedure outlined in the BART Guidelines demonstrates control alternatives for a *single* pollutant being compared in order to determine the most cost-effective control for that given pollutant via the least-cost envelope. The BART Guidelines do not provide for judging the cost-effectiveness of alternative controls by summing costs for the entire facility before judging cost-effectiveness. In this way comparisons to national benchmarks can be made. Section 6 (Options 6 - 11) sums the costs of NO_x / SO₂ control combinations before developing visibility impairment cost-effectiveness (\$/dv). Then, General Chemical and the Wyoming DEQ make judgments of non-cost-effectiveness using some unstated benchmark, likely derived from national benchmarks (e.g., \$10 million to \$15 million per deciview) that were developed on a per-pollutant basis.

Options 1 - 5 (1 - 3 for NO_x and 4 - 5 for SO₂) are correctly done for single pollutants, but then are incorrectly compared to one another on a single least-cost envelope, causing the dismissal of both SO₂ alternatives as not being on the least-cost curve. Dry FGD and Wet FGD are shown to be \$10.3 million and \$14.1 million per deciview, respectively. Certainly, Dry FGD should be considered as being cost-effective on a visibility improvement basis.

Since Options 1 - 5 used single control alternatives for a single pollutant, some judgments can be made on visibility improvement cost-effectiveness. SNCR is shown to cost \$14.6 million/dv (and an average of \$2,350 per ton for Units C & D). This is on the high end of reasonable visibility improvement cost-effectiveness numbers, but this value should be considered reasonable given that Great River Energy is proposing to add a dry scrubber/baghouse combination to reduce SO₂ at its Stanton Unit #1 in North Dakota with a cost-effectiveness of improving visibility at Theodore Roosevelt National Park of \$14.8 million/dv.

General Chemical only modeled impacts at the closest Class I area (Bridger Wilderness Area) and the Wyoming DEQ only modeled impacts at the two closest Class I areas (Bridger and Fitzpatrick Wilderness Areas). The FLMs typically ask for modeling at all Class I areas within 300 km, which would include Grand Teton and Yellowstone National Parks. This analysis should be included.

Both General Chemical and the Wyoming DEQ compare visibility improvement of the control alternatives to 0.5 deciviews in an effort to marginalize the visibility improvement projected to result from those control alternatives. This is a misuse of the Division's own guideline value of 0.5 deciviews. This value is used only to confirm that a BART-eligible facility "contributes" to visibility impairment (defined as a visibility impact greater than 0.5 deciviews at a Class I area)

so as to become subject to perform a BART determination.⁶ It is incorrect to dismiss a control strategy on the basis that the resulting improvement is not perceptible or significant. EPA states in the preamble to its BART Guidelines that, "Even though the visibility improvement from an individual source may not be perceptible, it should still be considered in setting BART because the contribution to haze may be significant relative to other source contributions in the Class I areas. Thus, we disagree that the degree of impairment should be contingent upon perceptibility. Failing to consider less-than-perceptible contributions to visibility impairment would ignore the CAA's intent to have BART requirements apply to sources that contribute to, as well as cause, such impairment."⁷ Regional haze is a cumulative regional issue with numerous sources contributing to the overall level of haze and therefore controls on a single source cannot be expected to resolve the haze issue. Nevertheless, small increments of visibility improvement at cost-effective rates from multiple sources will result in cumulative visibility improvement. This misinterpretation led the Wyoming DEQ to propose only combustion controls as BART, even though SNCR seems to be a possible cost-effective alternative as discussed above.

Regarding SO₂ the Wyoming DEQ did not require General Chemical to install controls, but required that they participate in the Western Backstop Sulfur Dioxide Trading Program. The Bridger Wilderness Area is not one of the 16 Colorado Plateau Class I Areas considered by the Grand Canyon Visibility Transport Commission to be under this trading program. Therefore, SO₂ controls of the Section 309 sources should be evaluated and documented as to the effects on the Section 308 areas.

After certain re-development of the BART cost analyses as discussed above is performed it looks as though SNCR might be reasonably considered as NO_x BART and Dry FGD might be reasonably considered as BART for SO₂.

¹ See 40 CFR Part 51, Appendix Y. The U.S. Environmental Protection Agency finalized its BART Guidelines on June 15, 2005, and published the preamble and final rule text in the Federal Register on July 6, 2005. The rulemaking action added Appendix Y to Part 51, titled "Guidelines for BART Determinations Under the Regional Haze Rule."

² OAQPS Control Cost Manual, Fifth Edition, February 1996, EPA 453/B-96-001. While this citation refers to the latest version at the time this guidance was written, you should use the version that is current as of when you conduct your impact analysis. This document is available at the following Web site: <http://www.epa.gov/ttn/catc/dir1/cs1ch2.pdf>.

³ Ibid, see Section IV.D.STEP 4.5.

⁴ Ibid., See the Preamble to 40 CFR Part 51, Appendix Y found in the Federal Register, Volume 70, No. 128, Wednesday, July 6, 2005, Section III.E.6.b.

⁵ Throughout this enclosure, the term "Federal Land Managers" and acronym "FLMs" refer to the U. S. Fish and Wildlife Service and the National Park Service, the Department of the Interior agencies tasked with protection of Clean Air Act-designated Class I areas.

⁶ See 40 CFR Part 51, Appendix Y. The U.S. Environmental Protection Agency finalized its BART Guidelines on June 15, 2005, and published the preamble and final rule text in the Federal Register on July 6, 2005. The rulemaking action added Appendix Y to Part 51, titled “Guidelines for BART Determinations Under the Regional Haze Rule.” See Section III.A.1.

⁷ Ibid., See the Preamble to 40 CFR Part 51, Appendix Y found in the Federal Register, Volume 70, No. 128, Wednesday, July 6, 2005, Section III.E.4.