

Appendix C

CONSIDERATIONS FOR A REVISED FIVE-FACTOR ANALYSIS FOR LOW-SULFUR COAL AS BART

a. Cost of Compliance

In contrast to Flue Gas Desulfurization, low-sulfur coal would be cost effective over the remainder of the first planning period, which ends in 2018. EPA underestimates certain costs and overestimates emission reductions with respect to installation of scrubbers according to a report prepared for Entergy by engineering firm Sargent and Lundy, LLC (“S & L”).¹ Taken in combination, EPA’s assumptions artificially lower the annual cost and cost-effectiveness (\$/ton reduced annually) estimates. The S & L report estimates that the actual cost-effectiveness for scrubbers would be between \$5,462 – \$6,445 more expensive per ton of SO₂ reduced than EPA’s estimate in the FIP. Due to market conditions for coal and natural gas, Entergy White Bluff has seen a decrease in dispatch that is expected to continue during this planning period resulting in a reduction in annual SO₂ emissions. Units 1 and 2 are currently permitted to emit 45,727.2 tons per year (tpy) SO₂ (10,440.0 lb SO₂/hr) each or 91,454.4 tpy SO₂ (20,880 lb SO₂/hr) combined.² Annual emissions for Entergy White Bluff units 1 and 2 combined from 2008 – 2014 ranged from 31,684 – 37,939 tpy SO₂—less than half of total allowable emissions in their permit.³ Annual emissions from Entergy White Bluff dropped to 20,480 tpy SO₂ in 2015.⁴ Based on a comparison of 2015 and 2016 Quarters 1 – 3 data submitted to the Air Markets Program Division

¹ *Review of EPA-s Cost Analysis for Arkansas Regional Haze Proposed Federal Implementation Plan* (2015). Prepared by Sargent & Lundy for Entergy Arkansas, Inc., Docket No. EPA-R06-OAR-2015-0189.

² Entergy Arkansas, Inc. – White Bluff, Permit No. 0263-AOP-R10, AFIN: 35-00110

³ 2009 Arkansas Department of Environmental Quality Emissions Inventory, 2010 Arkansas Department of Environmental Quality Emissions Inventory, 2011 National Emissions Inventory Version 2, 2012 Arkansas Department of Environmental Quality Emissions Inventory, 2013 Arkansas Department of Environmental Quality Emissions Inventory, 2014 National Emissions Inventory Version 1

<<https://eis.epa.gov/eis-system-web>>

⁴ Air Markets Program Data: Air Markets Program Data: Annual SO₂ Data for Entergy White Bluff for 2015
<<https://ampd.epa.gov/ampd/>>

of EPA, 2016 SO₂ emissions from Entergy White Bluff are on track to be even lower than 2015 SO₂ emissions. Because Entergy White Bluff's actual emissions are much lower than permitted and emissions from Entergy White Bluff are expected to continue to remain low due to economic dispatch throughout the remainder of the current Regional Haze planning period, it does not make sense to require installation of costly controls during the 2008 – 2018 planning period based on the assumption that Entergy will run at a greater capacity than is economically realistic.

EPA's BART determination overstates the cost-effectiveness of installing scrubbers at Entergy White Bluff. EPA underestimates certain costs, makes unreasonable assumptions with respect to the amortization period for the scrubbers, and makes errors in calculating baseline emissions and achievable emission reductions.⁵ EPA estimates the cost-effectiveness of scrubbers at Entergy White Bluff units 1 and 2 to be \$2,227/ ton and \$2,101, respectively. By contrast, total cost-effectiveness estimated by S & L ranges from \$6,097 – \$8,599, depending on the unit and remaining useful life assumptions.⁶

b. Existing Controls in Use at the Source

Second, the existing emissions in controls in use at the facility include low-sulfur coal and an enforceable emission rate appropriate for such a BART determination would solidify the improvements that these controls have already made during this planning period and ensure their continued operation until the next planning period. The current permitted emission rate for units 1 and 2 at Entergy White Bluff is 1.2 lb SO₂/million British Thermal Units (MMBtu) based on

⁵ *Review of EPA's Cost Analysis for Arkansas Regional Haze Proposed Federal Implementation Plan (2015)*. Prepared by Sargent & Lundy for Entergy Arkansas, Inc. Docket No. EPA-R06-OAR-2015-0189.

⁶ *Id.*

the new source performance standard for fossil-fuel fired steam generators.⁷ Entergy White Bluff is currently using lower sulfur content coal to minimize costs of compliance with the Acid Rain Program. Using low sulfur coal, Entergy White Bluff has been able to achieve monthly average emission rates in the range of 0.46 – 0.69 lb SO₂/MMBtu.⁸ The average monthly emission rate between 2009 and 2015 was 0.56 lb SO₂/MMBTU for unit 1 and 0.58lb SO₂/MMbtu for unit 2.⁹ Consequently, Entergy White Bluff has already lowered its visibility impact on potentially impacted federal Class I areas during this planning period beyond what would be expected due to emissions at its permitted emission rate. Setting a BART limit based on 0.6 lb SO₂/MMbtu on a 30-day rolling average would render the use of lower sulfur coal permanent and enforceable ensuring the continuation of reduced sulfur dioxide emissions from Entergy White Bluff and the associated visibility improvements at federal Class I areas.

c. Remaining Useful Life

S & L asserts that EPA arbitrarily assumed a longer remaining useful life and lower costs associated with balance of plant costs, owner's cost, escalation, and operating costs. EPA used the estimated life of the scrubber (30 years) for amortization rather than the remaining useful life of the Entergy White Bluff units. This method of amortization is particularly misleading given EPA's typical modeling assumptions use a 40-year book life for coal-fired power plants and a 15 year schedule for financing environmental retrofits. Entergy White Bluff unit 1 began operation in 1980 and unit 2 began operation in 1981. Units 1 and 2 will reach their 40th year in 2020 and 2021, respectively; therefore, an assumption of a 30-year amortization period starting in 2021

⁷ 40 CFR 60.42b(b)

⁸ Air Markets Program Data: Monthly Heat Input and SO₂ Data for Entergy White Bluff for 2009 - 2015
<<https://ampd.epa.gov/ampd/>>

⁹ Id.

does not reasonably take into account remaining useful life of the units. Coal-fired power plants may continue to operate beyond the 40-year book life assumption; but, it is unlikely that these units would operate 30 additional years beyond their book life.

d. Visibility Improvement

Most importantly, the visibility benefits from a low-sulfur coal BART determination would actually occur during this planning period. Requiring compliance with an emission limit appropriate to White Bluff's use of low-sulfur coal would have benefit of being feasible to implement in matter weeks as opposed to years. In addition, this consolidates the visibility improvement that has allowed Arkansas to exceed the FIP's reasonable progress goals for this planning period. In contrast, EPA the installation of dry scrubbers at White Bluff is not feasibility before the end of this planning period in 2018.