6560-50

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA-R08-OAR-2011-0870; FRL-9501-4]
Approval and Promulgation of Implementation Plans; South Dakota; Regional Haze State Implementation Plan

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: EPA is proposing to approve a revision to the South Dakota State Implementation Plan (SIP) addressing regional haze submitted by the State of South Dakota on January 21, 2011, as amended by a submittal received on September 19, 2011. This SIP revision was submitted to address the requirements of the Clean Air Act (CAA or Act) and our rules that require states to prevent any future and remedy any existing man-made impairment of visibility in mandatory Class I areas caused by emissions of air pollutants from numerous sources located over a wide geographic area (also referred to as the "regional haze program").

DATES: Comments: Comments must be received on or before **[Insert date 60 days from date of publication in the Federal Register]**.

ADDRESSES: Submit your comments, identified by Docket ID No. **EPA-R08-OAR-2011-0870**, by one of the following methods:

- http://www.regulations.gov. Follow the on-line instructions for submitting comments.
- E-mail: fallon.gail@epa.gov.
- Fax: (303) 312-6064 (please alert the individual listed in the **FOR FURTHER INFORMATION CONTACT** section if you are faxing comments).

- Mail: Director, Air Program, Environmental Protection Agency (EPA), Region 8, Mailcode 8P-AR, 1595 Wynkoop Street, Denver, Colorado 80202-1129.
- Hand Delivery: Director, Air Program, Environmental Protection Agency (EPA), Region 8, Mailcode 8P-AR, 1595 Wynkoop Street, Denver, Colorado 80202-1129. Such deliveries are only accepted Monday through Friday, 8:00 a.m. to 4:30 p.m., excluding federal holidays. Special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. **EPA-R08-OAR-2011-0870**. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at http://www.regulations.gov, including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through http://www.regulations.gov or e-mail. The http://www.regulations.gov Web site is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA, without going through http://www.regulations.gov, your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form

of encryption, and be free of any defects or viruses. The Regional Office's official hours of business are Monday through Friday, 8:30-4:30 p.m., excluding federal holidays.

FOR FURTHER INFORMATION CONTACT: Gail Fallon, EPA Region 8, at (303) 312-6281, or fallon.gail@epa.gov.

SUPPLEMENTARY INFORMATION:

Definitions

For the purpose of this document, we are giving meaning to certain words or initials as follows:

(i) The words or initials Act or CAA mean or refer to the Clean Air Act, unless the context indicates otherwise.

(ii) The words EPA, we, us or our mean or refer to the United States Environmental Protection Agency.

(iii) The initials SIP mean or refer to State Implementation Plan.

(iv) The initials NAAQS mean or refer to National Ambient Air Quality Standards.

(v) The words South Dakota and State mean the State of South Dakota.

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I. Background

A. Regional Haze

Regional haze is visibility impairment that is produced by a multitude of sources and activities which are located across a broad geographic area and emit particulate matter with a diameter less than 2.5 microns ($PM_{2.5}$) (e.g., sulfates, nitrates, organic carbon (OC), elemental carbon (EC) and soil dust) and its precursors (e.g., sulfur dioxide (SO_2), nitrogen oxides (NO_x), and in some cases, ammonia (NH_3) and volatile organic compounds (VOCs)). These precursors react in the atmosphere to form $PM_{2.5}$. $PM_{2.5}$ impairs visibility by scattering and absorbing light. Visibility impairment reduces the clarity, color and visible distance that one can see. $PM_{2.5}$ also can cause serious health effects and mortality in humans and contributes to environmental effects such as acid deposition and eutrophication.

Data from the "Interagency Monitoring of Protected Visual Environments" (IMPROVE) monitoring network show that visibility impairment caused by air pollution occurs virtually all the time at most national park and wilderness areas. The average visual range[1] in many Class I areas (i.e., national parks, memorial parks, wilderness areas and international parks meeting certain size criteria) in the western United States is 100-150 kilometers, or about one-half to two-thirds of the visual range that would exist without anthropogenic air pollution. 64 FR 35714, 35715 (July 1, 1999). In most of the eastern Class I areas of the United States, the average visual range is less than 30 kilometers, or about one-fifth of the visual range that would exist under estimated natural conditions. *Id.*

In section 169A of the 1977 Amendments to the CAA, Congress created a program for protecting visibility in the nation's national parks and wilderness areas. This section of the CAA

[1] Visual range is the greatest distance, in kilometers or miles, at which a dark object can be viewed against the sky.

establishes as a national goal the "prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I federal areas[2] which impairment results from man-made air pollution." CAA § 169A(a)(1). The terms "impairment of visibility" and "visibility impairment" are defined in the Act to include a reduction in visual range and atmospheric discoloration. *Id*. section 169A(g)(6). In 1980, we promulgated regulations to address visibility impairment in Class I areas that is "reasonably attributable" to a single source or small group of sources, i.e., "RAVI." 45 FR 80084 (December 2, 1980). These regulations represented the first phase in addressing visibility impairment. We deferred action on regional haze that emanates from a variety of sources until monitoring, modeling and scientific knowledge about the relationships between pollutants and visibility impairment had improved.

Congress added section 169B to the CAA in 1990 to address regional haze issues, and we promulgated regulations addressing regional haze in 1999. 64 FR 35714 (July 1, 1999), codified at 40 CFR part 51, subpart P. The Regional Haze Rule revised the existing visibility regulations to integrate into them provisions addressing regional haze impairment and establish a comprehensive visibility protection program for Class I areas. The requirements for regional haze, found at 40 CFR 51.308 and 51.309, are included in our visibility protection regulations at 40 CFR 51.300-309. Some of the main regional haze requirements are summarized in section II of this action. The requirement to submit a Regional Haze SIP applies to all 50 states, the

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[2] Areas designated as mandatory Class I federal areas consist of national parks exceeding 6000 acres, wilderness areas and national memorial parks exceeding 5000 acres, and all international parks that were in existence on August 7, 1977. *See* CAA section 162(a). In accordance with section 169A of the CAA, EPA, in consultation with the Department of Interior, promulgated a list of 156 areas where visibility is identified as an important value. *See* 44 FR 69122, November 30, 1979. The extent of a mandatory Class I area includes subsequent changes in boundaries, such as park expansions. CAA section 162(a). Although states and tribes may designate as Class I additional areas which they consider to have visibility as an important value, the requirements of the visibility program set forth in section 169A of the CAA apply only to ''mandatory Class I federal areas." Each mandatory Class I federal area is the responsibility of an FLM. *See* CAA section 302(i). When we use the term "Class I area" in this action, we mean a "mandatory Class I federal area."

District of Columbia and the Virgin Islands. States were required to submit a SIP addressing regional haze visibility impairment no later than December 17, 2007.[3] 40 CFR 51.308(b).

Few states submitted a Regional Haze SIP prior to the December 17, 2007 deadline, and on January 15, 2009, EPA found that 37 states, including South Dakota and the District of Columbia, and the Virgin Islands, had failed to submit SIPs addressing the regional haze requirements. 74 FR 2392. Once EPA has found that a state has failed to make a required submission, EPA is required to promulgate a FIP within two years unless the state submits a SIP and the Agency approves it within the two year period. CAA §110(c)(1).

B. Roles of Agencies in Addressing Regional Haze

Successful implementation of the regional haze program will require long-term regional coordination among states, tribal governments and various federal agencies. Pollution affecting the air quality in Class I areas can be transported over long distances, even hundreds of kilometers. Therefore, to effectively address the problem of visibility impairment in Class I areas, states need to develop strategies in coordination with one another, taking into account the effect of emissions from one jurisdiction on the air quality in another.

Because the pollutants that lead to regional haze can originate from sources located across broad geographic areas, we have encouraged the states and tribes across the United States to address visibility impairment from a regional perspective. Five regional planning organizations (RPOs) were formed to address regional haze and related issues. The RPOs first evaluated technical information to better understand how their states and tribes impact Class I areas across the country, and then pursued the development of regional strategies to reduce emissions of particulate matter (PM) and other pollutants leading to regional haze.

The Western Regional Air Program (WRAP) is a collaborative effort of state

[3] EPA's regional haze regulations require subsequent updates to the regional haze SIPs. 40 CFR 51.308(g) – (i).

governments, tribal governments and various federal agencies established to conduct data analyses, conduct pollutant transport modeling and coordinate planning activities among the western states. Member state governments include: Alaska, Arizona, California, Colorado, Idaho, Montana, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington and Wyoming. Tribal members include Campo Band of Kumeyaay Indians, Confederated Salish and Kootenai Tribes, Cortina Indian Rancheria, Hopi Tribe, Hualapai Nation of the Grand Canyon, Native Village of Shungnak, Nez Perce Tribe, Northern Cheyenne Tribe, Pueblo of Acoma, Pueblo of San Felipe and the Shoshone-Bannock Tribe of Fort Hall.

II. Requirements for Regional Haze SIPs

The following is a summary of the requirements of the Regional Haze Rule. See 40 CFR 51.308 for further detail regarding the requirements of the rule.

A. The CAA and the Regional Haze Rule

Regional Haze SIPs must assure reasonable progress towards the national goal of achieving natural visibility conditions in Class I areas. Section 169A of the CAA and our implementing regulations require states to establish long-term strategies for making reasonable progress toward meeting this goal. Implementation plans must also give specific attention to certain stationary sources that were in existence on August 7, 1977, but were not in operation before August 7, 1962, and require these sources, where appropriate, to install Best Available Retrofit Technology (BART) controls for the purpose of eliminating or reducing visibility impairment. The specific Regional Haze SIP requirements are discussed in further detail below.

B. Determination of Baseline, Natural and Current Visibility Conditions

The Regional Haze Rule establishes the deciview (dv) as the principal metric for measuring visibility. *See* 70 FR 39104, 39118. This visibility metric expresses uniform changes

in the degree of haze in terms of common increments across the entire range of visibility conditions, from pristine to extremely hazy conditions. Visibility is sometimes expressed in terms of the visual range, which is the greatest distance in kilometers or miles at which a dark object can just be distinguished against the sky. The deciview is a useful measure for tracking progress in improving visibility, because each deciview change is an equal incremental change in visibility perceived by the human eye. Most people can detect a change in visibility of one deciview.[4]

The deciview is used in expressing reasonable progress goals (RPGs) (which are interim visibility goals towards meeting the national visibility goal), defining baseline, current and natural conditions, and tracking changes in visibility. The Regional Haze SIPs must contain measures that ensure "reasonable progress" toward the national goal of preventing and remedying visibility impairment in Class I areas caused by man-made air pollution by reducing anthropogenic emissions that cause regional haze. The national goal is a return to natural conditions, i.e., man-made sources of air pollution would no longer impair visibility in Class I areas.

To track changes in visibility over time at each of the 156 Class I areas covered by the visibility program (40 CFR 81.401-437), and as part of the process for determining reasonable progress, states must calculate the degree of existing visibility impairment at each Class I area at the time of each Regional Haze SIP submittal and periodically review progress every five years midway through each 10-year implementation period. To do this, the Regional Haze Rule requires states to determine the degree of impairment (in deciviews) for the average of the 20 percent least impaired ("best") and the average of the 20 percent most impaired ("worst")

[4] The preamble to the Regional Haze Rule provides additional details about the deciview. 64 FR 35714, 35725 (July 1, 1999).

visibility days over a specified time period at each of their Class I areas. In addition, states must also develop an estimate of natural visibility conditions for the purpose of comparing progress toward the national goal. Natural visibility is determined by estimating the natural concentrations of pollutants that cause visibility impairment and then calculating total light extinction based on those estimates. We have provided guidance to states regarding how to calculate baseline, natural and current visibility conditions.[5]

For the first Regional Haze SIPs that were due by December 17, 2007, "baseline visibility conditions" were the starting points for assessing "current" visibility impairment. Baseline visibility conditions represent the degree of visibility impairment for the 20 percent least impaired days and 20 percent most impaired days for each calendar year from 2000 to 2004. Using monitoring data for 2000 through 2004, states are required to calculate the average degree of visibility impairment for each Class I area, based on the average of annual values over the five-year period. The comparison of initial baseline visibility conditions to natural visibility conditions indicates the amount of improvement necessary to attain natural visibility, while the future comparison of baseline conditions to the then current conditions will indicate the amount of progress made. In general, the 2000-2004 baseline period is considered the time from which improvement in visibility is measured.

C. Determination of Reasonable Progress Goals

The vehicle for ensuring continuing progress towards achieving the natural visibility goal is the submission of a series of Regional Haze SIPs from the states that establish two reasonable progress goals (i.e., two distinct goals, one for the "best" and one for the "worst" days) for every

[5] *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule*, September 2003, EPA-454/B-03-005, *available* at http://www.epa.gov/ttncaaa1/t1/memoranda/ Regional Haze _envcurhr_gd.pdf, (hereinafter referred to as "our 2003 Natural Visibility Guidance"); and *Guidance for Tracking Progress Under the Regional Haze Rule*,(September 2003, EPA-454/B-03-004, available at http://www.epa.gov/ttncaaa1/t1/memoranda/rh_tpurhr_gd.pdf, (hereinafter referred to as our "2003 Tracking Progress Guidance").

Class I area for each (approximately) 10-year implementation period. *See* 40 CFR 51.308(d), (f). The Regional Haze Rule does not mandate specific milestones or rates of progress, but instead calls for states to establish goals that provide for "reasonable progress" toward achieving natural (i.e., "background") visibility conditions. In setting reasonable progress goals, states must provide for an improvement in visibility for the most impaired days over the (approximately) 10-year period of the SIP, and ensure no degradation in visibility for the least impaired days over the same period. *Id*.

In establishing reasonable progress goals, states are required to consider the following factors established in section 169A of the CAA and in our Regional Haze Rule at 40 CFR 51.308(d)(1)(i)(A): (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 any potentially affected sources. States must demonstrate in their SIPs how these factors are considered when selecting the reasonable progress goals for the best and worst days for each applicable Class I area. In setting the reasonable progress goals, states must also consider the rate of progress needed to reach natural visibility conditions by 2064 (referred to as the "uniform rate of progress" or "glidepath") and the emission reduction measures needed to achieve that rate of progress over the 10-year period of the SIP. Uniform progress towards achievement of natural conditions by the year 2064 represents a rate of progress, which states are to use for analytical comparison to the amount of progress they expect to achieve. If a state establishes a reasonable progress goal that provides for a slower rate of improvement in visibility than the rate that would be needed to attain natural conditions by 2064, the state must demonstrate, based on the reasonable progress factors, that the rate of progress for the implementation plan to attain natural conditions by 2064 is not reasonable, and that the progress goal adopted by the state is

reasonable. In setting reasonable progress goals, each state with one or more Class I areas ("Class I state") must also consult with potentially "contributing states," i.e., other nearby states with emission sources that may be affecting visibility impairment at the state's Class I areas. 40 CFR 51.308(d)(1)(iv). In determining whether a state's goals for visibility improvement provide for reasonable progress toward natural visibility conditions, EPA is required to evaluate the demonstrations developed by the state pursuant to paragraphs 40 CFR 51.308(d)(1)(i) and (d)(1)(ii). 40 CFR 51.308(d)(1)(iii).

D. Best Available Retrofit Technology (BART)

Section 169A of the CAA directs states to evaluate the use of retrofit controls at certain larger, often uncontrolled, older stationary sources with the potential to emit 250 tons or more per year of any pollutant in order to address visibility impacts from these sources. Specifically, section 169A(b)(2)(A) of the Act requires states to revise their SIPs to contain such measures as may be necessary to make reasonable progress towards the natural visibility goal, including a requirement that certain categories of existing major stationary sources[6] built between 1962 and 1977 procure, install and operate BART as determined by the state or by EPA in the case of a plan promulgated under section 110(c) of the CAA. Under the Regional Haze Rule, states are directed to conduct BART determinations for such "BART-eligible" sources that may be anticipated to cause or contribute to any visibility impairment in a Class I area. Rather than requiring source-specific BART controls, states also have the flexibility to adopt an emissions trading program or other alternative program as long as the alternative provides greater reasonable progress towards improving visibility than BART.

On July 6, 2005, we published the *Guidelines for BART Determinations Under the Regional Haze Rule* at appendix Y to 40 CFR part 51 ("BART Guidelines") to assist states in

[6] The "major stationary sources" potentially subject to BART are listed in CAA section 169A(g)(7).

determining which of their sources should be subject to the BART requirements and in determining appropriate emission limits for each applicable source. 70 FR 39104. In making a BART determination for a fossil fuel-fired electric generating plant with a total generating capacity in excess of 750 megawatts (MW), a state must use the approach set forth in the BART Guidelines. A state is encouraged, but not required, to follow the BART Guidelines in making BART determinations for other types of sources. Regardless of source size or type, a state must meet the requirements of the CAA and our regulations for selection of BART, and the state's BART analysis and determination must be reasonable in light of the overarching purpose of the regional haze program.

The process of establishing BART emission limitations can be logically broken down into three steps: first, states identify those sources which meet the definition of "BART-eligible source" set forth in 40 CFR 51.301[7]; second, states determine which of such sources "emits any air pollutant which may reasonably be anticipated to cause or contribute to any impairment of visibility in any such area" (a source which fits this description is "subject to BART"); and third, for each source subject to BART, states then identify the best available type and level of control for reducing emissions.

States must address all visibility-impairing pollutants emitted by a source in the BART determination process. The most significant visibility-impairing pollutants are SO_2, NO_x and PM. We have stated that states should use their best judgment in determining whether VOC or NH_3 compounds impair visibility in Class I areas.

Under the BART Guidelines, states may select an exemption threshold value for their BART modeling, below which a BART-eligible source would not be expected to cause or

[7] BART-eligible sources are those sources that have the potential to emit 250 tons or more of a visibility-impairing air pollutant, were not in operation prior to August 7, 1962, but were in existence on August 7, 1977, and whose operations fall within one or more of 26 specifically listed source categories. 40 CFR 51.301.

contribute to visibility impairment in any Class I area. The state must document this exemption threshold value in the SIP and must state the basis for its selection of that value. Any source with emissions that model above the threshold value would be subject to a BART determination review. The BART Guidelines acknowledge varying circumstances affecting different Class I areas. States should consider the number of emission sources affecting the Class I areas at issue and the magnitude of the individual sources' impacts. Any exemption threshold set by the state should not be higher than 0.5 deciviews. 40 CFR part 51, appendix Y, section III.A.1.

In their SIPs, states must identify "BART-eligible sources" and "subject-to-BART sources" and document their BART control determination analyses. The term "BART-eligible source" used in the BART Guidelines means the collection of individual emission units at a facility that together comprises the BART-eligible source. In making BART determinations, section 169A(g)(2) of the CAA requires that states consider the following factors: (1) the costs of compliance; (2) the energy and non-air quality environmental impacts of compliance; (3) any existing pollution control technology in use at the source; (4) the remaining useful life of the source; and (5) the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology. *See also* 40 CFR 51.308(e)(1)(ii)(A).

A Regional Haze SIP must include source-specific BART emission limits and compliance schedules for each source subject to BART. Once a state has made its BART determination, the BART controls must be installed and in operation as expeditiously as practicable, but no later than five years after the date of our approval of the Regional Haze SIP. CAA section 169(g)(4) and 40 CFR 51.308(e)(1)(iv). In addition to what is required by the Regional Haze Rule, general SIP requirements mandate that the SIP must also include all regulatory requirements related to monitoring, recordkeeping, and reporting for the BART

controls on the source. *See* CAA section 110(a). As noted above, the Regional Haze Rule allows states to implement an alternative program in lieu of BART so long as the alternative program can be demonstrated to achieve greater reasonable progress toward the national visibility goal than would BART.

E. Long Term Strategy (LTS)

Consistent with the requirement in section 169A(b) of the CAA that states include in their Regional Haze SIP a 10 to 15 year strategy for making reasonable progress, section 51.308(d)(3) of the Regional Haze Rule requires that states include a long term strategy (LTS) in their Regional Haze SIPs. The LTS is the compilation of all control measures a state will use during the implementation period of the specific SIP submittal to meet applicable reasonable progress goals. The LTS must include "enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals" for all Class I areas within, or affected by emissions from, the state. 40 CFR 51.308(d)(3).

When a state's emissions are reasonably anticipated to cause or contribute to visibility impairment in a Class I area(s) located in another state or states, the Regional Haze Rule requires the state to consult with the other state(s) in order to develop coordinated emissions management strategies. 40 CFR 51.308(d)(3)(i). Also, a state with a Class I area impacted by emissions from another state must consult with such contributing state, and must also demonstrate that it has included in its SIP all measures necessary to obtain its share of the emission reductions needed to meet the reasonable progress goals for the Class I area. *Id*. at (d)(3)(ii). The RPOs have provided a forum for significant interstate consultation, but additional consultations between states may be required to sufficiently address interstate visibility issues. This is especially true where two states belong to different RPOs.

States should consider all types of anthropogenic sources of visibility impairment in developing their LTS, including stationary, minor, mobile and area sources. At a minimum, states must describe how each of the following seven factors listed below are taken into account in developing their LTS: (1) emission reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment (RAVI); (2) measures to mitigate the impacts of construction activities; (3) emissions limitations and schedules for compliance to achieve the reasonable progress goals; (4) source retirement and replacement schedules; (5) smoke management techniques for agricultural and forestry management purposes including plans as currently exist within the state for these purposes; (6) enforceability of emissions limitations and control measures; and (7) the anticipated net effect on visibility due to projected changes in point, area and mobile source emissions over the period addressed by the LTS . 40 CFR 51.308(d)(3)(v).

F. Coordinating Regional Haze and Reasonably Attributable Visibility Impairment (RAVI)

As part of the Regional Haze Rule, we revised 40 CFR 51.306(c) regarding the LTS for RAVI to require that the RAVI plan must provide for a periodic review and SIP revision not less frequently than every three years until the date of submission of the state's first plan addressing regional haze visibility impairment, which was due December 17, 2007, in accordance with 40 CFR 51.308(b) and (c). On or before this date, the state must revise its plan to provide for review and revision of a coordinated LTS for addressing RAVI and regional haze, and the state must submit the first such coordinated LTS with its first Regional Haze SIP. Future coordinated LTS and periodic progress reports evaluating progress towards reasonable progress goals, must be submitted consistent with the schedule for SIP submission and periodic progress reports set

forth in 40 CFR 51.308(f) and 51.308(g), respectively. The periodic review of a state's LTS must report on both regional haze and RAVI and must be submitted to us as a SIP revision.

G. Monitoring Strategy and Other SIP Requirements

Section 51.308(d)(4) of the Regional Haze Rule includes the requirement for a monitoring strategy for measuring, characterizing and reporting of regional haze visibility impairment that is representative of all mandatory Class I federal areas within the state. The strategy must be coordinated with the monitoring strategy required in section 51.305 for RAVI. Compliance with this requirement may be met through "participation" in the IMPROVE network, i.e., review and use of monitoring data from the network. The monitoring strategy is due with the first Regional Haze SIP, and it must be reviewed every five years. The monitoring strategy must also provide for additional monitoring sites if the IMPROVE network is not sufficient to determine whether reasonable progress goals will be met.

Under section 51.308(d)(4), the SIP must also provide for the following:

- Procedures for using monitoring data and other information in a state with mandatory Class I areas to determine the contribution of emissions from within the state to regional haze visibility impairment at Class I areas both within and outside the state;
- Reporting of all visibility monitoring data to the Administrator at least annually for each Class I area in the state, and where possible, in electronic format;
- Developing a statewide inventory of emissions of pollutants that are reasonably anticipated to cause or contribute to visibility impairment in any Class I area. The inventory must include emissions for a baseline year, emissions for the most recent year for which data are available, and estimates of future projected emissions. A state must also make a commitment to update the inventory periodically; and

- Other elements, including reporting, recordkeeping and other measures necessary to assess and report on visibility.

The Regional Haze Rule requires control strategies to cover an initial implementation period extending to the year 2018, with a comprehensive reassessment and revision of those strategies, as appropriate, every 10 years thereafter. Periodic SIP revisions must meet the core requirements of section 51.308(d), with the exception of BART. The requirement to evaluate sources for BART applies only to the first Regional Haze SIP. Facilities subject to BART must continue to comply with the BART provisions of section 51.308(e). Periodic SIP revisions will assure that the statutory requirement of reasonable progress will continue to be met.

H. Consultation with States and Federal Land Managers (FLMs)

The Regional Haze Rule requires that states consult with federal land managers (FLMs) before adopting and submitting their SIPs. 40 CFR 51.308(i). States must provide FLMs an opportunity for consultation, in person and at least 60 days prior to holding any public hearing on the SIP. This consultation must include the opportunity for the FLMs to discuss their assessment of impairment of visibility in any Class I area and to offer recommendations on the development of the reasonable progress goals and on the development and implementation of strategies to address visibility impairment. Further, a state must include in its SIP a description of how it addressed any comments provided by the FLMs. Finally, a SIP must provide procedures for continuing consultation between the state and FLMs regarding the state's visibility protection program, including development and review of SIP revisions, five-year progress reports, and the implementation of other programs having the potential to contribute to impairment of visibility in Class I areas.

III. Our Evaluation of South Dakota's Regional Haze SIP

The State of South Dakota submitted a revision to its SIP to address the requirements for regional haze on January 21, 2011. On September 19, 2011, South Dakota submitted an amendment to the Regional Haze SIP revision for approval into the South Dakota SIP. The amendment incorporated changes made by the State to ensure approvability of the SIP revision. The changes incorporated detailed monitoring, recordkeeping, and reporting requirements for BART sources into state regulation, Administrative Rules of South Dakota (ARSD) Chapter 74:36:21, including specifying that BART limits apply at all times and clarified compliance test methods for particulate matter and continuous emission monitoring system requirements for SO_2 and NO_x. In addition, South Dakota revised the reasonable progress analysis for the GCC Dacotah cement plant. The following is a discussion of our evaluation of the revision.

A. Affected Class I Areas

In accordance with 40 CFR 51.308(d), South Dakota identified two Class I areas within its borders: Badlands National Park and Wind Cave National Park. South Dakota is responsible for developing reasonable progress goals for these two Class I areas. South Dakota emissions have or may reasonably be expected to have impacts at Class I areas in other states including: Boundary Waters Canoe Area Wilderness Area and Voyageurs National Park in Minnesota; Medicine Lake National Wildlife Refuge Wilderness Area and UL Bend National Wildlife Refuge Wilderness Area in Montana; Bridger Wilderness Area, Fitzpatrick Wilderness Area, Grand Teton National Park, Teton Wilderness Area, North Absaroka Wilderness Area, Washakie Wilderness Area and Yellowstone National Park in Wyoming; and Theodore Roosevelt National Park and Lostwood Wilderness Area in North Dakota. South Dakota consulted with the appropriate state air quality agency in each of these states through their involvement with the WRAP and worked with other states that are not members of WRAP (including Minnesota and

Nebraska). Assessment of South Dakota's contribution to haze in these Class I areas is based on technical analyses developed by WRAP.

B. Determination of Baseline, Natural and Current Visibility Conditions

As required by section 51.308(d)(2)(i) of the Regional Haze Rule and in accordance with our 2003 Natural Visibility Guidance, South Dakota calculated baseline/current and natural visibility conditions for its Class I areas, Badlands and Wind Cave, on the most impaired and least impaired days, as summarized below. The natural visibility conditions, baseline visibility conditions and visibility impact reductions needed to achieve the uniform rate of progress in 2018 for both South Dakota Class I areas are presented in Table 1 and further explained in this section. More detail is available in Section 3 of the South Dakota SIP.[8]

Table 1. Visibility Impact Reductions Needed Based on Best and Worst Days Baselines, Natural Conditions and Uniform Rate of Progress (URP) Goals for South Dakota Class I Areas

South Dakota Class I Area	20% Worst Days				20% Best Days	
	2000-2004 Baseline (dv)	2018 URP Goal (dv)	2018 Reduction Needed (delta dv)	2064 Natural Conditions (dv)	2000-2004 Baseline (dv)	2064 Natural Conditions (dv)
Badlands National Park	17.14	15.02	2.12	8.06	6.89	2.86
Wind Cave National Park	15.84	13.94	1.90	7.71	5.14	1.88

1. Estimating Natural Visibility Conditions

Natural background visibility as defined in our 2003 Natural Visibility Guidance is

[8] The visibility and uniform rate of progress calculations presented in Table 1 and elsewhere in section III.B represent corrections EPA made to minor math errors in the visibility results South Dakota presented in the SIP and which the State agrees will be corrected with the next routine revision of the SIP. Our corrections are included in the docket in a spreadsheet entitled, EPA-R08-OAR-2011-0870 South Dakota Regional Haze Proposal Section III.B Visibility Conditions Corrections.

estimated by calculating the expected light extinction using default estimates of natural concentrations of fine particle components adjusted by site-specific estimates of humidity. This calculation uses the IMPROVE equation, which is a formula for estimating light extinction from the estimated natural concentrations of fine particle components (or from components measured by the IMPROVE monitors). As documented in our 2003 Natural Visibility Guidance, EPA allows states to use "refined" or alternative approaches to this guidance to estimate the values that characterize the natural visibility conditions of Class I areas. One alternative approach is to develop and justify the use of alternative estimates of natural concentrations of fine particle components. Another alternative is to use the "new IMPROVE equation" that was adopted for use by the IMPROVE Steering Committee in December 2005.[9] The purpose of this refinement to the "old IMPROVE equation" is to provide more accurate estimates of the various factors that affect the calculation of light extinction.

For Badlands and Wind Cave, South Dakota opted to use the revised IMPROVE equation to calculate natural background conditions. This is an acceptable approach under our 2003 Natural Visibility Guidance. EPA has found the use of the revised IMPROVE equation appropriate for WRAP states.[10] For Badlands, the natural visibility background for the 20

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[9] The IMPROVE program is a cooperative measurement effort governed by a steering committee composed of representatives from federal agencies (including representatives from EPA and the FLMs) and RPOs. The IMPROVE monitoring program was established in 1985 to aid the creation of federal and state implementation plans for the protection of visibility in Class I areas. One of the objectives of IMPROVE is to identify chemical species and emission sources responsible for existing anthropogenic visibility impairment. The IMPROVE program has also been a key participant in visibility-related research, including the advancement of monitoring instrumentation, analysis techniques, visibility modeling, policy formulation and source attribution field studies.

[10] The science behind the revised IMPROVE equation is summarized in a document entitled, Technical Support Document for Technical Products Prepared by the Western Regional Air Partnership (WRAP) in Support of Western Regional Haze Plans, February 28, 2011, (hereinafter referred to as EPA WRAP Technical Support Document and available in the docket) and in numerous published papers. See for example: Hand, J.L., and Malm, W.C., 2006, *Review of the IMPROVE Equation for Estimating Ambient Light Extinction Coefficients - Final Report.* March 2006. Prepared for IMPROVE, Colorado State University, Cooperative Institute for Research in the Atmosphere, Fort Collins, Colorado, *available at* http://vista.cira.colostate.edu/improve/publications/GrayLit/016_IMPROVEeqReview/IMPROVEeqReview.htm and Pitchford, Marc., 2006, *Natural Haze Levels II: Application of the New IMPROVE Algorithm to Natural*

percent worst days is 8.06 deciviews and for the 20 percent best days is 2.86 deciviews. For Wind Cave, the natural visibility result for the 20 percent worst days is 7.71 deciviews and for the 20 percent best days is 1.88 deciviews. We have reviewed South Dakota's estimates of the natural visibility conditions and as the approach used by the State was consistent with our 2003 Natural Visibility Guidance we are proposing to find them acceptable.

2. Estimating Baseline Visibility Conditions

As required by section 51.308(d)(2)(i) of the Regional Haze Rule, South Dakota calculated baseline visibility conditions for Badlands and Wind Cave. The baseline condition calculation begins with the calculation of light extinction using the IMPROVE equation. The IMPROVE equation sums the light extinction[11] resulting from individual pollutants, such as sulfates and nitrates. As with the natural visibility conditions calculation, South Dakota chose to use the revised IMPROVE equation.

The period for establishing baseline visibility conditions is 2000-2004, and baseline conditions must be calculated using available monitoring data. 40 CFR 51.308(d)(2). The South Dakota Regional Haze SIP employed visibility monitoring data collected by IMPROVE monitors located in both South Dakota Class I areas for the years 2000 through 2004 and the resulting baseline conditions represent an average for 2000-2004. South Dakota calculated the baseline conditions at Badlands as 17.14 deciviews on the 20 percent worst days, and 6.89 deciviews on the 20 percent best days. South Dakota calculated the baseline conditions at Wind Cave as 15.84 deciviews on the 20 percent worst days, and 5.14 deciviews on the 20 percent best days. We have reviewed South Dakota's estimations of baseline visibility conditions and

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Species Concentrations Estimates. Final Report of the Natural Haze Levels II Committee to the RPO Monitoring/Data Analysis Workgroup. September 2006, *available at* http://vista.cira.colostate.edu/improve/Publications/GrayLit/029_NaturalCondII/naturalhazelevelsIIreport.ppt.

[11] The amount of light lost as it travels over one million meters. The haze index, in units of dv, is calculated directly from the total light extinction, b_{ext} expressed in inverse megameters (Mm^{-1}), as follows: $HI = 10 \ln(b_{ext}/10)$.

propose to find these acceptable as the approach the State used was consistent with our 2003 Natural Visibility Guidance.

3. Natural Visibility Impairment

To address the requirements of 40 CFR 51.308(d)(2)(iv)(A), South Dakota also calculated the number of deciviews by which baseline conditions exceed natural visibility conditions at Badlands and Wind Cave. For Badlands, baseline conditions exceed natural conditions by 9.08 deciviews (17.14 – 8.06) for the 20 percent worst days and 4.03 deciviews (6.89 – 2.86) for the 20 percent best days. For Wind Cave, these figures are 8.13 (15.84 – 7.71) and 3.26 deciviews (5.14 – 1.88), respectively.

4. Uniform Rate of Progress

In setting the reasonable progress goals, South Dakota analyzed and determined the uniform rate of progress needed to reach natural visibility conditions by the year 2064. In so doing, South Dakota compared the baseline visibility conditions in Badlands and Wind Cave to the natural visibility conditions in Badlands and Wind Cave (as described above) and determined the uniform rate of progress needed in order to attain natural visibility conditions by 2064 in both Class I areas. South Dakota constructed the uniform rate of progress consistent with the requirements of the Regional Haze Rule by plotting a straight graphical line from the baseline level of visibility impairment for 2000-2004 to the level of visibility conditions representing no anthropogenic impairment in 2064 for Badlands and Wind Cave. The uniform rates of progress are summarized in Table 2 and further described below.

Using a baseline visibility value at Badlands of 17.14 deciviews and a “refined” natural visibility value of 8.06 deciviews for the 20 percent worst days, South Dakota calculated the uniform rate of progress to be approximately 0.151 deciviews per year (deciviews /year or

dv/yr). This results in a total reduction of 9.08 deciviews to reach the natural visibility condition of 8.06 deciviews in 2064. The uniform rate of progress results in a visibility improvement of 2.18 deciviews needed for the period covered by this SIP revision submittal (up to and including 2018).

Using a baseline visibility value at Wind Cave of 15.84 deciviews and a "refined" natural visibility value of 7.71 deciviews for the 20 percent worst days, South Dakota calculated the uniform rate of progress to be approximately 0.136 deciviews per year. This results in a total reduction of 8.13 deciviews to reach the natural visibility condition of 7.71 deciviews in 2064. The uniform rate of progress results in a visibility improvement of 1.89 deciviews needed for the period covered by this SIP revision submittal (up to and including 2018).

Table 2. Summary of Uniform Rates of Progress

Class I Area	**Badlands**	**Wind Cave**
Baseline Conditions	17.14 dv	15.84 dv
Natural Visibility	8.06 dv	7.71 dv
Total Improvement by 2064	9.08 dv	8.13 dv
Needed Improvement for this SIP by 2018	2.18 dv	1.89 dv
URP	0.151 dv/year	0.136 dv/year

We propose to find that South Dakota has appropriately calculated the uniform rates of progress.

C. BART

BART is an element of South Dakota's LTS for the first implementation period. As discussed in more detail in section II.D of this preamble, the BART evaluation process consists of three components: (1) an identification of all the BART-eligible sources; (2) an assessment of whether those BART-eligible sources are in fact subject to BART; and (3) a determination of any BART controls. South Dakota addressed these steps as follows:

1. Identification of BART-Eligible Sources

The first step of a BART evaluation is to identify all the BART-eligible sources within the state's boundaries. The State identified the BART-eligible sources in South Dakota by utilizing the approach set out in the BART Guidelines (70 FR 39158); this approach provides three criteria for identifying BART-eligible sources: (1) one or more emission units at the facility fit within one of the 26 categories listed in the BART Guidelines; (2) the emission unit(s) began operation on or after August 7, 1962, and was in existence on August 7, 1977; and (3) potential emissions of any visibility-impairing pollutant from subject units are 250 tons or more per year. South Dakota initially screened its emissions inventory and permitting database to identify major facilities with emission units in one or more of the 26 BART categories. Following this, South Dakota used its databases and records to identify facilities in these source categories with potential emissions of 250 tons per year or more for any visibility-impairing pollutant from any units that were in existence on August 7, 1977 and began operation on or after August 7, 1962.

The BART Guidelines direct states to address SO_2, NO_x and direct PM (including both coarse (PM_{10}) and fine ($PM_{2.5}$) particulate matter emissions as visibility-impairing pollutants and to exercise their "best judgment to determine whether VOC or NH_3 emissions from a source are likely to have an impact on visibility in an area." *See* 70 FR 39162. The available inventory information indicates VOCs in South Dakota overwhelmingly come from biogenic sources, and NH_3 in South Dakota is primarily due to area sources, such as livestock and fertilizer application. Because these are not point sources, they are not subject to BART. We have reviewed this information and propose to find South Dakota's focus on SO_2, NO_x, and PM acceptable.

South Dakota identified BART-eligible sources in South Dakota as shown in Table 3. This information is presented in Section 6 of South Dakota's SIP.

Table 3. List of BART-Eligible Sources in South Dakota

BART-eligible Source	Location	BART Source Category (SC)	Nearest Class I Area
1. Northern States Power Company (Units 1, 2, and 3)	Sioux Falls, South Dakota	SC 1 - fossil fuel steam electric plants >250 MMBtu/hr heat input	N/A[1]
2. Otter Tail Power Company, Big Stone I (Unit 1)	Near Big Stone City, South Dakota	SC 1 - fossil fuel steam electric plants >250 MMBtu/hr heat input	Boundary Waters 431 km
3. Pete Lien and Sons, Inc.	Rapid City, South Dakota	SC 12 – lime plants	Wind Cave 52 km

[1]South Dakota did not analyze the three units at Northern States Power for distance to Class I areas as they have been decommissioned.

2. Identification of Sources Subject to BART

The second step of the BART evaluation is to identify those BART-eligible sources that may reasonably be anticipated to cause or contribute to any visibility impairment at any Class I area, i.e. those sources that are subject to BART. The BART Guidelines allow states to consider exempting some BART-eligible sources from further BART review because they may not reasonably be anticipated to cause or contribute to any visibility impairment in a Class I area.

a. Modeling Methodology

The BART Guidelines provide that states may use the CALPUFF[12] modeling system or another appropriate model to predict the visibility impacts from a single source on a Class I area and to, therefore, determine whether an individual source is anticipated to cause or contribute to impairment of visibility in Class I areas, i.e., "is subject to BART." The BART Guidelines state

[12] Note that our reference to CALPUFF encompasses the entire CALPUFF modeling system, which includes the CALMET, CALPUFF, and CALPOST models and other pre and post processors. The different versions of CALPUFF have corresponding versions of CALMET, CALPOST, etc. which may not be compatible with previous versions (e.g., the output from a newer version of CALMET may not be compatible with an older version of CALPUFF). The different versions of the CALPUFF modeling system are available from the model developer at http://www.src.com/verio/download/download.htm.

that we find CALPUFF is the best regulatory modeling application currently available for predicting a single source's contribution to visibility impairment (70 FR 39162).

The BART Guidelines also recommend that states develop a modeling protocol for making individual source attributions, and suggest that states may want to consult with us and their RPO to address any issues prior to modeling. South Dakota relied on WRAP's CALPUFF modeling for South Dakota BART sources as recommended by the BART Guidelines.[13] 40 CFR part 51, appendix Y, section III.A.3.

To determine if each BART-eligible source has a significant impact on visibility, South Dakota used WRAP's CALPUFF modeling results to estimate daily visibility impacts above estimated natural conditions at each Class I area within 300 km of any BART-eligible facility, based on maximum actual 24-hour emissions over a three year period (2000-2002).

b. Contribution Threshold

For states using modeling to determine the applicability of BART to single sources, the BART Guidelines note that the first step is to set a contribution threshold to assess whether the impact of a single source is sufficient to cause or contribute to visibility impairment at a Class I area. The BART Guidelines state that, "[a] single source that is responsible for a 1.0 deciview change or more should be considered to 'cause' visibility impairment." 70 FR 39104, 39161. The BART Guidelines also state that "the appropriate threshold for determining whether a source contributes to visibility impairment may reasonably differ across states," but, "[a]s a general matter, any threshold that you use for determining whether a source 'contributes' to visibility impairment should not be higher than 0.5 deciviews." *Id.* Further, in setting a contribution threshold, states should "consider the number of emissions sources affecting the Class I areas at

[13] The WRAP modeling protocol is available at http://pah.cert.ucr.edu/aqm/308/bart/WRAP_RMC_BART_Protocol_Aug15_2006.pdf.

issue and the magnitude of the individual sources' impacts." The Guidelines affirm that states are free to use a lower threshold if they conclude that the location of a large number of BART-eligible sources in proximity to a Class I area justifies this approach.

South Dakota used a contribution threshold of 0.5 deciviews for determining which sources are subject to BART. The State's decision was based on the following factors: (1) 0.5 deciviews equates to the 5% extinction threshold for new sources under the Prevention of Significant Deterioration (PSD) New Source Review rules, (2) 0.5 deciviews is consistent with the threshold selected by other states in the west, which all selected 0.5 deciviews, and (3) 0.5 deciviews represents the limit of perceptible change. Although we do not agree that all of the factors considered by South Dakota's Department of Environmental and Natural Resources are relevant in determining whether a source can be considered to cause or contribute to visibility impairment, we propose to approve the State's threshold of 0.5 deciviews. As the discussion below indicates, Big Stone I is the only BART-eligible source in South Dakota in operation. Given that and the fact that the modeling indicates that Big Stone I is reasonably anticipated to have an impact over the 0.5 deciview threshold at several Class I Areas, it is apparent that no BART-eligible sources were exempted from review based on the 0.5 deciviews threshold that could have had meaningful impact on visibility in one or more Class I areas. We are proposing that 0.5 deciviews is a reasonable threshold for South Dakota in determining whether its BART-eligible sources are subject to BART.

c. Sources Identified by South Dakota as Subject to BART

South Dakota determined that the three units at Northern States Power were not subject to BART because the units have been decommissioned and are no longer permitted to operate under the facility's Title V air quality permit. Consistent with the BART Guidelines, South

Dakota requested that WRAP model each of its remaining operating BART-eligible sources to assess the extent of their contribution to visibility impairment at surrounding Class I areas.

The WRAP modeling results demonstrated that Pete Lien and Sons, Inc. did not cause or contribute to visibility impairment at any Class I area. After reviewing the modeling inputs, South Dakota determined that the vertical kiln should be modeled again due to several errors. However, before additional modeling could be done, Pete Lien and Sons, Inc. shut down and dismantled the kiln in 2009 per its Title V permit.[14]

The WRAP modeling results for Otter Tail Power Company's Big Stone I are summarized in Table 4. The results show that Big Stone I's emissions cause visibility impacts that exceed the 0.5 deciviews threshold at the Badlands National Park in South Dakota, Theodore Roosevelt National Park in North Dakota, and Boundary Waters Wilderness and Voyageurs National Park in Minnesota.

Table 4. WRAP's Modeling Results for Big Stone I

Class I Area	State	Minimum Distance to Class I Area (km)	98th Percentile Visibility Impact (dv)[1]
Badlands	SD	470	0.683
Boundary Waters	MN	431	1.034
Bridger	WY	1,041	0.001
Fitzpatrick	WY	1,050	0.001
Grand Teton	WY	1,112	0.001
Lostwood	ND	585	0.263
Medicine Lake	MT	690	0.256
North Absaroka	WY	1,013	0.011
Teton	WY	1,052	0.004
Theodore Roosevelt	ND	555	0.687
UL Bend	MT	902	0.089
Voyageurs	MN	438	0.729
Washakie	WY	1,006	0.007

[14] Although Pete Lien and Sons' existing Title V air quality permit still identifies the vertical kiln as a unit, permit condition 1.1 specifies in the footnote of Table 1-1 that Pete Lien and Sons is required to shutdown and dismantle the vertical kiln before the initial startup of Unit #45. Pete Lien and Sons fulfilled this commitment by notifying South Dakota on March 13, 2009, that the vertical kiln was shutdown and dismantled. See SIP Section 6.1.2.

Wind Cave	SD	572	0.263
Yellowstone	WY	1,049	0.009

[1]Modeling results represent the maximum 98th percentile impact over the modeled 3-year meteorological period 2001-2003.

South Dakota allowed Otter Tail Power Company to re-run the modeling after the company identified several errors in actual emission rates and stack parameters. After additional review, Otter Tail Power Company developed a revised modeling protocol that both the State and EPA approved. The modeling protocol is included in Appendix A of the SIP. The results from Otter Tail's modeling are summarized in Table 5. Otter Tail's modeling report is included in Appendix B of the SIP.

Table 5. Otter Tail's Modeling Results for Big Stone I

Class I Area	**98th Percentile Visibility Impact (dv)[1]**
Badlands	0.5
Boundary Waters	1.1
Lostwood	0.4
Theodore Roosevelt	0.5
Voyageurs	0.7
Wind Cave	0.3
Isle Royale	0.7

[1]Modeling results represent the maximum 98th percentile impact over the modeled meteorological years 2002, 2006, and 2007.

In reviewing Otter Tail's results, the State rounded to one significant figure and determined that Big Stone I emissions cause visibility impacts that exceed the 0.5 deciviews threshold at the same Class I areas identified in the WRAP modeling in addition to Isle Royale in Michigan. South Dakota relied on Otter Tail's modeling, noting that it best represented the visibility impacts from Big Stone I because the original WRAP modeling did not have the correct

emission rates and stack parameters and that the modeling protocol adjustments improved the accuracy of the model over long distances.

3. BART Determinations and Federally Enforceable Limits

The third step of a BART evaluation is to perform the BART analysis. The BART Guidelines (70 FR 39164) describe the BART analysis as consisting of the following five steps:

- Step 1: Identify All Available Retrofit Control Technologies,
- Step 2: Eliminate Technically Infeasible Options,
- Step 3: Evaluate Control Effectiveness of Remaining Control Technologies,
- Step 4: Evaluate Impacts and Document the Results, and
- Step 5: Evaluate Visibility Impacts.

In determining BART, the State must consider the five statutory factors in section 169A of the CAA: (1) the costs of compliance; (2) the energy and non-air quality environmental impacts of compliance; (3) any existing pollution control technology in use at the source; (4) the remaining useful life of the source; and (5) the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology. *See also* 40 CFR 51.308(e)(1)(ii)(A). The five-factor analysis occurs during steps 4 and 5 of the process.

South Dakota requested that Otter Tail Power Company complete a BART analysis for Big Stone I and used this analysis as a basis for its BART determination for this source for NO_x, SO_2 and PM. The Otter Tail BART analysis is included in Appendix C of the SIP. Otter Tail generally followed the five steps contained in the BART Guidelines and evaluated the five BART factors. In some instances, South Dakota identified additional control technologies for evaluation and also added an analysis of average cost effectiveness compared to visibility benefit (dollar per deciview) for the various multi-pollutant control options. We find that South Dakota,

through its reliance on Otter Tail's BART analysis, reasonably considered the five BART factors and arrived at a reasonable BART determination for Big Stone I. We propose to approve South Dakota's BART determination summarized below.

a. Otter Tail Power Company, Big Stone I

Background

Big Stone I is a steam electric generating plant located near Big Stone City, South Dakota with one generating unit burning Powder River Basin coal and a net electrical output of 475 MW. The Otter Tail Power Company is the operating agent for the Big Stone Plant co-owners: NorthWestern Energy, Montana-Dakota Utilities, Co., a division of MDU Resources Group, and Otter Tail Power Company. The generating unit is a Babcock cyclone boiler that started operating in 1975. The State analyzed each pollutant and its effect on the visibility in Class I areas. Since Big Stone I does not have a total generating capacity greater than 750 MW, South Dakota was not required to follow the BART Guidelines in determining BART, but it generally followed the approach for determining BART set out in the Guidelines. A summary of the State's analyses of existing controls and potential BART controls for each pollutant is set forth below. The State's BART determination for Big Stone I is provided in Section 6 of the SIP. The visibility and cost impacts noted in the following assessment are derived from the company's BART analysis provided in Appendix B of the SIP.[15]

Unit 1 Boiler

SO_2 BART Review: Unit 1 has no existing SO_2 controls. The baseline uncontrolled SO_2 emissions that South Dakota reported in the SIP are 18,000 tons per year.

[15] Otter Tail's costs rely on the CUECost model. While we are satisfied with the State's control technology conclusions as further described in this section, in general we do not recommend relying on the CUECost model. According to the BART Guidelines, ''cost estimates should be based on the OAQPS Control Cost Manual, where possible'' ''[i]n order to maintain and improve consistency.'' 70 FR 39104, 39166. The OAQPS Control Cost Manual is now known as The EPA Air Pollution Control Cost Manual, EPA/452/B–02–001, 6th Ed., January 2002.

Step 1: Identify All Available Technologies.

The State identified the following SO_2 control options as having potential application to Unit 1: fuel switching, coal cleaning, coal upgrading (K-Fuel), hydrated lime injection, semi-dry flue gas desulfurization (FGD), wet FGD, Enviroscrub, electro catalytic oxidation and the Airborne process.

Step 2: Eliminate Technically Infeasible Options.

The State eliminated the following options as technically infeasible: coal cleaning, coal upgrading, hydrated lime injection, Enviroscrub, Electro catalytic oxidation and the Airborne process. Fuel switching is a viable method to reduce sulfur dioxide emissions by switching to a fuel with lower sulfur content. The Big Stone facility's primary fuel source is subbituminous coal obtained from the Powder River Basin in Wyoming. Powder River Basin subbituminous coal has one of the lowest sulfur contents available in the United States. As such, the State concluded that Otter Tail Power Company has already implemented fuel switching.

Step 3: Evaluate Control Effectiveness of Remaining Control Technology.

The State considered the control efficiencies listed in Table 6.

Table 6. Summary of Big Stone I SO_2 BART Analysis Control Technologies for Unit 1 Boiler[1]

Control Option	Control Efficiency (%)	Emission Rate (lb/MM Btu)	Emissions (tons/yr)	Emissions Reduction (tons/yr)
Wet FGD #1	95	0.043	900	17,100
Wet FGD #2	83	0.15	3,130	14,870
Semi-Dry FGD #1	90	0.09	1,880	16,120
Semi-Dry	83	0.15		14,870

FGD #2			3,130	

[1]South Dakota calculated emissions from a baseline of 18,000 tons per year of SO_2. The baseline was derived from the highest average 24-hour average emission rate (4,832 pounds per hour) for calendar years 2001 through 2003 and operations occurring 85% of the time or 7,746 hours per year.

Step 4: Evaluate Impacts and Document Results.

Factor 1: Costs of compliance.

The State relied on Otter Tail's cost analysis for SO_2 controls and this is summarized below in Table 7. The State deemed the average cost effectiveness reasonable for the two remaining control options, semi-dry and wet FGD.

Table 7. Summary of Big Stone I SO_2 BART Cost Analysis for Unit 1 Boiler

Control Option	Total Installed Capital Cost (MM$)	Total Annual Cost (MM$)	Emissions Reduction (tons/yr)	Cost Effectiveness ($/ton)
Wet FGD #1	171.8	29.05	17,100	$1,699
Wet FGD #2	171.8	28.90	14,870	$1,944
Semi-Dry FGD #1	141.3	23.57	16,120	$1,462
Semi-Dry FGD #2	141.3	23.33	14,870	$1,569

Factor 2: Energy impacts.

The State noted increased energy demand estimates provided by Otter Tail of 9,500 kilowatts (2.0 percent of generation) for wet FGD and 3,325 kilowatts (0.7 percent of generation) for semi-dry FGD. The State did not identify any energy requirements that would preclude the selection of either of the two alternatives.

Factor 3: Non-air quality environmental impacts.

The State described the non-air quality environmental impacts of the two control alternatives including the solid and aqueous waste streams. The semi-dry FGD system would be installed upstream of the existing baghouse. The baghouse would be used to collect the injected lime and reacted sulfur dioxide emissions along with other existing particulate matter emissions. Otter Tail did not identify how much additional particulate matter would be collected by the baghouse due to the use of the semi-dry FGD system. Otter Tail assumed the additional material collected in the baghouse would be negligible compared to the existing collection. Otter Tail estimated that the wet FGD system would generate an additional 44,700 tons of gypsum solids which would need to be properly disposed. The State did not identify any non-air quality effects that would preclude the selection of either of the two alternatives.

Factor 4: Remaining useful life.

The expected remaining useful life of the unit is greater than 30 years.

Factor 5: Evaluate visibility impacts.

Table 8 presents a comparison of the visibility impacts of the two top control options, wet FGD and semi-dry FGD. The values are derived from modeling conducted by Otter Tail. For the cases presented, Otter Tail held the emission rates for NO_x and PM constant but varied the SO_2 emissions rates in the model as noted. In some cases, the modeling predicted that the semi-dry FGD would produce a greater visibility benefit than the wet FGD. It is not clear why the model predicted this result; it may relate to stack parameters. Based on the visibility modeling, the State found that there would be no discernible visibility benefit from selecting a wet FGD over a semi-dry FGD.

Table 8. Visibility Impact Comparison Between Wet and Semi-Dry FGD SO_2 Controls[1] (98th Percentile – Deciviews)

Option[2]	Control Equipment	Class I Area[4]	2002	2006	2007

#3	OFA and Semi-dry FGD (0.09 lb/MMBtu)	Boundary Waters	0.319	0.534	0.620
		Voyageurs	0.307	0.391	0.450
		Isle Royale	0.363	0.287	0.323
		Badlands	0.219	0.172	0.230
		Theodore Roosevelt	0.087	0.234	0.173
#4	OFA and Wet FGD (0.043 lb/MMBtu)	Boundary Waters	0.350	0.521	0.611
		Voyageurs	0.312	0.464	0.502
		Isle Royale	0.351	0.250	0.290
		Badlands	0.225	0.191	0.234
		Theodore Roosevelt	0.084	0.230	0.138
	Comparison Review[3] (incremental visibility impact of wet FGD (in Option 3) compared to semi-dry FGD (in Option 4))	Boundary Waters	0.031	-0.013	-0.009
		Voyageurs	0.005	0.073	0.052
		Isle Royale	-0.012	-0.037	-0.033
		Badlands	0.006	0.019	0.004
		Theodore Roosevelt	-0.003	-0.004	-0.035
#5a	SOFA and Semi-dry FGD (0.09 lb/MMBtu)	Boundary Waters	0.250	0.419	0.493
		Voyageurs	0.249	0.306	0.354
		Isle Royale	0.285	0.226	0.256
		Badlands	0.165	0.133	0.180
		Theodore Roosevelt	0.069	0.186	0.141
#5b	SOFA and Wet FGD (0.043 lb/MMBtu)	Boundary Waters	0.274	0.407	0.478
		Voyageurs	0.244	0.365	0.393
		Isle Royale	0.274	0.195	0.227

		Badlands	0.174	0.147	0.182
		Theodore Roosevelt	0.066	0.180	0.108
	Comparison Review[3] (incremental visibility impact of wet FGD (in Option 5a) compared to semi-dry FGD (in Option 5b))	Boundary Waters	0.024	-0.012	-0.015
		Voyageurs	-0.005	0.059	0.039
		Isle Royale	-0.011	-0.031	-0.029
		Badlands	0.009	0.014	0.002
		Theodore Roosevelt	-0.003	-0.006	-0.033

[1] Otter Tail Power Company conducted visibility modeling for both wet and semi-dry FGD options using combined controls with constant emission rates for NO_x and PM. Thus, the results shown include the noted SO_2 and NO_x control options and the existing fabric filter PM control option.
[2] An explanation of each of the numbered control options and the corresponding emission rates is included in Section 6 of the SIP, Table 6-13, p.94.
[3] A negative number means the wet FGD had a lower visibility impact than the semi-dry FGD.
[4] These are the Class I areas that exceed the 0.5 deciview threshold as listed in Table 5.

Step 5: Select BART.

South Dakota determined BART to be the second ranked control option, semi-dry FGD at 90 percent control efficiency in Section 6.3.5.2 of the SIP. Even though the top ranked control option, wet FGD at 95 percent control efficiency, reduced the SO_2 emissions more than the second ranked option, the State determined that there is no discernible difference between the two options when considering visibility impacts. South Dakota specified BART limits of 505 lb/hour and 0.09 lb/MMBtu (30-day rolling average) that apply at all times including periods of startup, shutdown and malfunction. The estimated cost of the semi-dry FGD system was $1,462 per ton ($/ton) of SO_2 removed, and the capital and annualized costs were estimated to be $141,300,000 and $23,570,000 per year ($/year or $/yr), respectively.

We are proposing to approve the State's SO_2 BART determination for Big Stone I. The State's assessment of costs and other impacts and its elimination of the wet FGD at 95% control efficiency was reasonable based on the five-factor analysis. While the average cost effectiveness values for both wet FGD and semi-dry FGD are reasonable, the modeling predicted that the use

of a wet FGD at 95% efficiency rather than a semi-dry FGD at 90% efficiency would result in minimal, if any, visibility benefit. Thus, it was reasonable for the State to eliminate a wet FGD at 95% efficiency from consideration. The installation of a semi-dry FGD at Big Stone I will result in a reduction in annual SO_2 emissions from the plant of approximately 16,120 tons.[16] The visibility benefit for the selected BART controls for all pollutants combined is provided in the summary in Table 12 in section III.C.3.b. below.

NO_x BART Review: Big Stone I is already equipped with overfire air (OFA) for NO_x control. South Dakota indicates in the SIP that Unit 1 has baseline controlled NO_x emissions of 18,000 tons per year with an emission rate of 0.65 lb/MMBtu.

Step 1: Identify All Available Technologies.

South Dakota identified the following control options as having potential application as BART: selective catalytic reduction (SCR), oxygen enhanced combustion, catalytic absorption/oxidation, gas reburn, Enviroscrub, electro-catalytic oxidation, NOxStar, Cascade processes, selective non-catalytic reduction (SNCR), rich reagent injection (RRI), flue gas recirculation (FGR), separated over-fire air (SOFA), over-fire air (OFA), and low-NO_x burners (LNB).

Step 2: Eliminate Technically Infeasible Options.

The State identified the following control options as technically infeasible: oxygen enhanced combustion, absorption/oxidation, gas reburn, Enviroscrub, electro-catalytic oxidation, NOxStar, Cascade processes, and LNB. The State noted that flue gas recirculation is not known to reduce nitrogen oxide emissions any further when added with an over-fire air system.

[16] The selected SO_2 emission limit of 0.09 lb/MMBtu (30-day rolling average) also happens to be well below the presumptive limit for EGU's without existing controls and over the 750 MW generating capacity threshold described in the BART Guidelines.

Therefore, the State and Otter Tail Power Company did not conduct any further review of flue-gas recirculation.

Step 3: Evaluate Control Effectiveness of Remaining Control Technology.

The State considered the control efficiencies listed in Table 9.

Table 9. Summary of Big Stone I NO_x BART Analysis Control Technologies for Unit 1 Boiler[1]

Control Option	Control Efficiency (%)	Emission Rate (lb/MMBtu)	Emissions (tons/yr)	Emissions Reduction (tons/yr)
SCR and SOFA	89	0.10	2,000	16,000
RRI, SNCR and SOFA	77	0.20	4,090	13,910
SNCR and SOFA	60	0.35	7,220	10,780
SOFA	42	0.50	10,360	7,640
OFA	25	0.65	13,490	4,510

[1]South Dakota calculated emissions from a baseline of 18,000 tons per year of NO_x. The baseline was derived from the highest average 24-hour average emission rate (4,855 pounds per hour) for calendar years 2001 through 2003 and operations occurring 85% of the time or 7,746 hours per year.

Step 4: Evaluate Impacts and Document Results.

Factor 1: Costs of compliance.

The State relied on Otter Tail's cost analysis for NO_x controls and this is summarized below in Table 10. The State deemed the average cost effectiveness reasonable for all of the remaining control options, SCR, SNCR, RRI, SOFA, and OFA, as provided by Otter Tail.

Table 10. Summary of Big Stone I NO_x BART Cost Analysis for Unit 1 Boiler

Control Option	Total Installed Capital Cost (MM$)	Total Annual Cost (MM$)	Emissions Reduction (tons/yr)	Average Cost Effectiveness ($/ton)
SCR and SOFA	81.9	13.21	16,000	825

RRI, SNCR and SOFA	16.2	11.39	13,910	818
SNCR and SOFA	11.9	3.99	10,780	197
SOFA	4.8	0.65	7,640	85
OFA	0	0.14	4,510	31

Factor 2: Energy impacts.

The State noted that all the energy impacts were less than one percent of the plant's generating capacity and did not identify any energy requirements that would preclude the selection of any of the alternatives.

Factor 3: Non-air quality environmental impacts.

The State discussed that the OFA and SOFA systems would increase the amount of unburned carbon in the flyash, which would increase the amount of flyash that needs to be properly disposed. Otter Tail Power Company considers this increase negligible compared to the existing amount flyash being properly disposed.

The State noted that the SNCR and the SCR systems would generate a small amount of unreacted ammonia or urea to be emitted. Even though ammonia and urea are not considered regulated air pollutants, these emissions are involved in the formation of ammonium sulfates and ammonium nitrates, which contribute to the amount of visibility impairment.

The State did not identify any non-air quality environmental impacts that would preclude the selection of any of the control equipment alternatives.

Factor 4: Remaining useful life.

The expected remaining useful life of the unit is greater than 30 years.

Factor 5: Evaluate visibility impacts.

Table 12, below, presents the visibility impacts for the State's selected BART controls for all pollutants. The values presented come from Otter Tail's modeling. The State found that SCR + SOFA would result in greater visibility improvement than the other options.

Step 5: Select BART.

South Dakota determined BART to be SCR + SOFA. South Dakota specified BART limits of 561 lb/hour and 0.10 lb/MMBtu (30-day rolling average) that apply at all times including periods of startup, shutdown, and malfunction. The estimated cost of the SCR + SOFA controls was $825 per ton ($/ton) of NO_x removed, and the capital and annualized costs were estimated to be $81,800,000, and $13,210,000 per year ($/year or $/yr), respectively.

We are proposing to approve the State's NO_x BART determination for Big Stone I. The State's assessment of costs and other impacts was reasonable. The installation of SCR and SOFA at Big Stone I will result in a reduction in annual NO_x emissions from the plant of approximately 16,000 tons. Table 12, below, provides the visibility benefit for the selected BART controls for all pollutants combined.

PM BART Review: Big Stone I is already equipped with a pulse jet fabric filter baghouse for PM which is considered the most efficient control technology available. The baseline controlled PM emissions that South Dakota reported in the SIP are 300 tons per year with an emission rate of 0.015 lb/MMBtu. The State identified the following PM control options as having potential application to the Big Stone I boiler: existing fabric filter baghouse, new fabric filter baghouse, compact hybrid particulate collector (COHPAC), electrostatic precipitator, wet scrubber, and cyclones/multiclones. The State did not eliminate any of the control technologies as technically infeasible for controlling PM emissions from the boiler.

South Dakota determined BART to be no additional controls. The State reviewed the five BART factors generally, but noted no further detailed analysis was required since Otter Tail has already installed and is operating a fabric filter baghouse, which is the top particulate control technology. South Dakota specified BART limits of 67.3 lb/hour and 0.012 lb/MMBtu (30-day rolling average). The latter represents a stringent level of control that is consistent with recent Best Available Control Technology determinations for PSD permits.

We are proposing to approve the State's PM BART determination for Big Stone I. The State's assessment that no detailed analysis is required since the most stringent control option is already in place is consistent with the BART Guidelines. (40 CFR 51, appendix Y, IV.D.5.) Furthermore, since South Dakota's proposed BART emission limits does not explicitly exempt emissions during malfunctions, we interpret the SIP to require compliance with the PM limits at all times (including malfunctions).

b. South Dakota's BART Results and Summary

We have summarized South Dakota's BART determinations in Table 11 below. We have summarized the visibility impacts at the appropriate Class I areas for South Dakota's selected BART controls in Table 12 below. The substantial emissions reductions in SO_2 and NO_x will result in a significant improvement in visibility at several Class I areas. The visibility improvement from reducing both pollutants at the most impacted area, Boundary Waters, is estimated to be 0.9 deciviews and 54 fewer days above 0.5 deciviews.[17]

South Dakota's Regional Haze Rule, which we are proposing to approve with the SIP, requires each source subject to BART to install and operate BART no later than five years after we approve the Regional Haze SIP. Administrative Rules of South Dakota (ARSD) Chapter

[17] The 0.9 deciviews estimated visibility benefit at Boundary Waters is calculated by subtracting the 2007 impact of 0.17 deciviews in Table 12 from the baseline impact of 1.1 deciviews in Table 5. Our calculations for 54 fewer days above 0.5 deciviews are included in the docket.

74:36:21. Given the scope of the retrofits involved, five years represents a schedule that is expeditious as practicable. This satisfies the requirement under 40 CFR 51.308(e)(1)(iv), that "each source subject to BART be required to install and operate BART as expeditiously as practicable, but in no event later than 5 years after approval of the implementation plan revision."

As noted previously, to be approvable, the Regional Haze SIP must include monitoring, recordkeeping, and reporting requirements to ensure that the BART limits are enforceable. South Dakota has included these requirements in ARSD Chapter 74:36:21. We have reviewed these requirements and find them to be adequate as they relate to the BART limits we are proposing to approve. In particular, for SO_2 and NO_x BART limits, the rule requires the use of continuous emission monitoring systems (CEMS) to determine compliance, generally in accordance with 40 CFR part 75. For the filterable PM BART limits, the rule requires stack testing. Adequate recordkeeping and reporting requirements are also specified.

For the reasons discussed above, we propose to find that South Dakota satisfied the BART requirements of 40 CFR 51.308(e).

Table 11. South Dakota BART Determinations for Big Stone I Unit 1 Boiler

Pollutant	Baseline Emissions (tons/yr)[1]	Baseline Level of Control (% Reduction)	BART Level of Control (% Reduction)	Control Device	Emissions after Controls (tons/yr)	Emission Reduction (tons/yr)	Emission Limit
SO_2	18,000	0%	90%	Semi-dry FGD	1,880	16,120	505 lb/hr, and 0.09 lb/MMBtu, 30-day rolling Average
NO_x	18,000	25%	88%	SOFA + SCR	2,000	16,000	561 lb/hr, and 0.10 lb/MMBtu, 30-day rolling average
PM	300	95 – 99.9%	95-99.9%	Existing Fabric Filter	--	--	67.3 lb/hr , and 0.012 lb/MMBtu, 30-day rolling average

[1]South Dakota calculated baseline emissions for SO_2 and NO_x by identifying the highest average 24-hour average actual emission rate for the years 2001 through 2003 and adjusted this to 85% operations level or 7,746 hours per year.

Table 12. Visibility Impacts for South Dakota's BART Determinations for Big Stone I Unit 1 Boiler (98th Percentile – Deciviews)

Control Options	Class I Area	2002	2006	2007
SCR, SOFA, and Semi-Dry FGD[1]	Boundary Waters	0.097	0.136	0.170
	Voyageurs	0.086	0.107	0.123
	Isle Royale	0.092	0.077	0.098
	Badlands	0.079	0.060	0.070
	Theodore Roosevelt	0.036	0.070	0.064

[1]The results reflect the visibility impacts after installation of controls with an SCR at a NO_x emissions rate of 0.1 lb/MMBtu, a semi-dry FGD at an SO_2 emissions rate of 0.15 lb/MMBtu, and the existing pulse jet fabric filter baghouse at a PM emissions rate of 0.015 lb/MMBtu. The selected BART emissions limits for SO_2 and PM are lower than the modeled values, therefore, the visibility impacts after BART controls are installed will be lower than those presented in this table. See Table 8 for a comparison of visibility impacts for wet and semi-dry FGD. See Table 5 for baseline visibility impacts.

D. Evaluation of South Dakota's Reasonable Progress Goals

In order to establish reasonable progress goals for Badlands and Wind Cave and to determine the controls needed for the LTS, South Dakota followed the process established in the Regional Haze Rule. First, South Dakota identified the anticipated visibility improvement in 2018 in the two South Dakota Class I areas using the WRAP Community Multi-Scale Air Quality (CMAQ) photochemical grid modeling results. This modeling identified the extent of visibility improvement from the baseline by pollutant for each Class I area. The modeling relied on projected source emission inventories, which included enforceable federal and state regulations already in place and anticipated BART controls.

South Dakota then identified, with input from EPA, the sources and source categories (other than BART sources) in South Dakota that are major contributors to visibility impairment and considered whether these sources should be controlled based on a consideration of the factors identified in the CAA and EPA's regulations. *See* CAA 169A(g)(1) and 40 CFR 51.308(d)(1)(i)(A). South Dakota also computed the baseline visibility impacts for these sources

using their 2002 actual emissions and the CALPUFF modeling system. Next, based on this analysis, South Dakota set the reasonable progress goals for each Class I area and compared the reasonable progress goals for each area to the 2018 uniform rate of progress. The SIP includes South Dakota's analysis and conclusion that reasonable progress will be made by 2018, including an analysis of pollutant trends, emission reductions, and improvements expected. The reasonable progress discussion and analyses are included in Section 7 of the SIP. We are proposing to approve South Dakota's submitted reasonable progress goals as described more fully below.

1. WRAP Visibility Modeling

The primary tool WRAP relied upon for modeling regional haze improvements by 2018, and for estimating South Dakota's Reasonable Progress Goals, was the CMAQ model. The CMAQ model was used to estimate 2018 visibility conditions in South Dakota and all western Class I areas, based on application of anticipated regional haze strategies in the various states' regional haze plans, including assumed controls on BART sources.[18]

2. Reasonable Progress "Four-Factor" Analysis

In determining the measures necessary to make reasonable progress, states must take into account the following four factors and demonstrate how they were taken into consideration in selecting reasonable progress goals for a Class I area:

- Costs of Compliance,
- Time Necessary for Compliance,
- Energy and Non-Air Quality Environmental Impacts of Compliance, and
- Remaining Useful Life of any Potentially Affected Sources.

[18] We provide a more detailed discussion on the WRAP modeling in section IV.E.3 below and in the EPA WRAP Technical Support Document available in the docket.

CAA 169A(g)(1) and 40 CFR 308(d)(1)(i)(A).

As the purpose of the reasonable progress analysis is to evaluate the potential of controlling certain sources or source categories for addressing visibility from manmade sources, the four-factor analysis conducted by South Dakota addresses only anthropogenic sources, on the assumption that the focus should be on sources that can be "controlled." In its evaluation of potential sources or source categories for reasonable progress, South Dakota primarily considered point sources. South Dakota determined that the key pollutants contributing to visibility impairment at the two Class I areas are SO_2, organic carbon and NO_x. South Dakota also only considered controls for emissions of SO_2 and NO_x (i.e., sulfate and nitrate) which are typically associated with anthropogenic sources. South Dakota determined the major source of organic carbon in the two Class I areas is natural fire. By reviewing the WRAP modeling results, South Dakota determined that PM emissions from point sources contribute only a minimal amount to visibility impairment in the South Dakota Class I areas.

Based on the WRAP CMAQ modeling, South Dakota's contribution of ammonia sulfate, organic carbon mass, and ammonia nitrate concentrations is approximately 1.5% for ammonia sulfate, minimal for organic carbon mass, and 4% for ammonia nitrate. Therefore, South Dakota concluded that minimal gain would be achieved from further reduction in sulfur dioxide, organic carbon mass, and nitrogen oxide emissions from point sources within South Dakota. More discussion on sources of sulfate and nitrate emissions and the State's rationale for focusing on point sources is included in Section 7 of the SIP. South Dakota initially asserted that a four-factor analysis was not warranted based on its belief that Badlands and Wind Cave would both achieve the needed reductions to meet the uniform rate of progress for both Class I areas despite the WRAP predictions. This belief was based on the State's conclusion that the emission

estimates included in the WRAP modeling turned out to be too high. The emission estimates did not include reductions reflecting the BART emission limits for Otter Tail Power Company's BigStone I facility but did include anticipated emissions from two proposed coal-fired power plants -- Big Stone II and NextGen. The Big Stone II facility will not be constructed and the NextGen facility is on hold indefinitely.

However, South Dakota did not remodel with revised emissions estimates to demonstrate that the uniform rate of progress would be met for Badlands and Wind Cave. EPA therefore requested that South Dakota perform a four-factor analysis for three facilities, at a minimum: the Black Hills Ben French power plant, the GCC Dacotah cement plant, and the Pete Lien and Sons lime plan. South Dakota did perform a four-factor analysis for Black Hills Ben French and GCC Dacotah based on the WRAP's report, *Supplementary Information for Four-Factor Analyses for Selected Individual Facilities in South Dakota*, May 19, 2009, authored by EC/R (hereinafter referred to as the EC/R Report). The EC/R Report is included in Appendix F of the SIP. The EC/R report did not address the Pete Lien and Sons lime plant.

During our review of South Dakota's four-factor analysis, we analyzed actual emissions data from EPA's 2002 National Emissions Inventory database. We started with the emissions inventory totals for SO_2 and NO_x then divided the actual emissions (Q) in tons per year from the sources by their distance (D) in kilometers to the nearest Class I federal area. A summary list of the largest sources we reviewed in our Q/D analysis is included below in Table 13.

Table 13. EPA Q/D Analysis for South Dakota Sources

Source	SO_2 + NO_x 2000-2004 Average (tons)	Distance to Nearest Class I Area (km)	Q/D to Closest Class I Area (tons/km)
Black Hills, Ben French Power Plant	1,782	65	27.41
GCC Dacotah	4,465	66	67.66
John Morrell & Company	648	410	1.58
Merillat Industries Inc.	135	58	2.33
Pete Lien and Sons, Inc.	276	59	4.68

South Dakota did not undertake a reasonable progress analysis of John Morrel & Company or Merillat Industries, Inc. Given the low Q/D values associated with these two sources, we are proposing to find that South Dakota's approach was reasonable.

Although Pete Lien and Sons, Inc. also had a Q/D of less than 10, the State did consider whether controls should be required for reasonable progress. South Dakota opted, however, not to conduct a full four-factor analysis on Pete Lien and Sons but did a general review of the impacts of this facility. Pete Lien and Sons SO_2 emissions are less than 1 ton/year and so have a de minimus impact on visibility in any Class I area. For NO_x, the State has determined that the plant is already required to use what is considered Best Available Control Technology (BACT), and thus no further controls are required. As further explanation, the 2002 NO_x emissions for Pete Lien and Sons were 272 tons/year. In May 2008, the company included a BACT analysis

for NO_x in a PSD application for a new preheater-type rotary lime kiln and ancillary equipment for this facility. The BACT analysis found non-selective catalytic reduction and selective catalytic reduction to be technically infeasible for several reasons including temperatures and the location of injection nozzles. South Dakota reviewed the application at the time and agreed with the conclusion that BACT for a lime rotary kiln was considered good combustion practices. South Dakota conducted a further review of EPA's RACT/BACT/LAER Clearinghouse to determine if any new rotary lime kilns had been permitted since Pete Lien and Sons' PSD application had been submitted with more stringent post-combustion BACT controls. There were three entries. One occurred in each of the states of Texas, Ohio, and Wisconsin. The Texas source only involved carbon monoxide. In Ohio and Wisconsin, the permitting authorities had concluded in the BACT analyses for NO_x that no control technologies were cost effective and that good combustion practices were considered BACT. The State concluded there were no new rotary lime kilns that had been required to install post-combustion NO_x controls for BACT. As a result, the State concluded that such controls would not constitute BART.

South Dakota also evaluated Pete Lien and Sons visibility impacts at Badlands and Wind Cave by conducting a CALPUFF modeling analysis. The modeling report is included in Appendix I of the SIP. A summary of the modeling results in provided below in Table 14.

Table 14. Summary of Baseline Visibility Impacts from Reasonable Progress Source Pete Lien and Sons (98^{th} Percentile, dv)

Year	Badlands	Wind Cave
2002	0.05	0.06
2006	0.06	0.05
2007	0.07	0.05

We propose to approve South Dakota's less detailed analysis for Pete Lien and conclusion that no controls are required. A Q/D value of 10 is generally viewed as a

conservative threshold for identifying facilities that may have significant source-specific impacts. We consider a Q/D threshold of 10 to be reasonable for this planning period based on the FLM's proposed FLAG Guidance amendments for initial screening criteria, as well as statements in EPA's BART guidelines.[19] For Pete Lien and Sons, the Q/D of 4.68 is well below this threshold; the baseline visibility impacts analysis by South Dakota in Table 14 confirms that Pete Lien and Sons does not have significant source-specific impacts.

South Dakota undertook a more detailed analysis of the two sources that exceeded a Q/D of 10, Black Hills Ben French and GCC Dacotah. These sources are further described below in Table 15.

Table 15. South Dakota Sources for Reasonable Progress Four-Factor Analyses

Source	Unit	Type	Capacity	SO_2 Actual Average Emissions 2002 (tons/yr)	NO_x Actual Average Emissions 2002 (tons/yr)
Black Hills, Ben French Power Plant	Unit 1 Boiler	EGU	25 MWe	785	907
GCC Dacotah	Wet Kiln 4	Cement Plant	550 tons clinker/day	26	707
	Wet Kiln 5	Cement Plant	550 tons clinker/day	431	388
	Wet Kiln 6[1]	Cement Plant	2,250 tons clinker/day	885	2,267

[1]South Dakota opted not to include Kiln 6 in its four-factor analysis as further described in the State's conclusions in section III.D.3 below.

Four-Factor Analysis

[19] The relevant language in our BART Guidelines reads, "Based on our analyses, we believe that a state that has established 0.5 dv as a contribution threshold could reasonably exempt from the BART review process sources that emit less than 500 tons per year of NO_X or SO_2 (or combined NO_X and SO_2), as long as these sources are located more than 50 kilometers from any Class I area; and sources that emit less than 1000 tons per year of NO_X or SO_2 (or combined NO_X and SO_2) that are located more than 100 kilometers from any Class I area." (See 40 CFR 51, appendix Y, section III, How to Identify Sources "Subject to BART.") The values described equate to a Q/D of 10.

The control options and costs that South Dakota considered were derived, in part, from the EC/R report. EPA also requested South Dakota consider SNCR at GCC Dacotah which was not included in the EC/R report. For the Black Hills Ben French and GCC Dacotah reasonable progress sources, SO_2 and NO_x are uncontrolled, although the Black Hills Ben French facility uses low-sulfur coal (0.33 wt%) to minimize formation of SO_2 during combustion.

Cost of Compliance

Tables 16 and 17 show the cost of compliance for the control technologies evaluated for each of the reasonable progress sources.

Table 16. Control Option Costs for Reasonable Progress Source Black Hills, Ben French Power Plant[1]

Pollu-tant	Control Option	2002	Control Efficiency		Reductions		Capital Cost ($1000)	Annual Cost ($1000)	Cost Effectiveness Range ($/ton)	
		(tons /yr)	%	%	(tons/ yr)	(tons /yr)			High End	Low End
NO_x	LNB	907	30	75	272	680	1,250	195	717	287
	LNB w/ OFA	907	50	65	454	590	1,780	298	656	505
	SNCR	907	30	75	272	680	1,290	770	2,831	1,132
	SCR	907	40	90	363	816	3,000	754	2,077	924
							4,250	1,068	2,942	1,309
SO_2	Dry Sorbent Injection	785	10	40	79	314	4,300	1,700	21,519	5,414
	Spray Dryer Absorber	785		90		707	11,600	2,670		3,777
	Wet FGD	785		90		707	14,600	2,760		3,904

[1] The cost analysis was based on a 30-year equipment life. Black Hills indicated the expected life of the Ben French power plant is 10 years. South Dakota conducted an additional analysis with a 10-year equipment life. The 10-year evaluation resulted in slightly higher average cost effectiveness values but did not change the outcome of the analysis. All controls are cost effective with the exception of the dry sorbent injection at the lowest end of the control efficiency range which would not reflect the true performance capability of the technology; we consider the high end of the range to be most appropriate.

Table 17. Control Option Costs for Reasonable Progress Source GCC Dacotah, Cement Plant[1]

Pollu-tant	Control Option	2002	Control Efficiency		Reductions		Capital Cost ($1000)	Annual Cost ($1000)	Cost Effectiveness Range ($/ton)	
		(tons/yr)	%	%	(tons/ yr)	(tons/ yr)			High End	Low End

Wet Kiln 4										
NO_x	LNB (indirect)	707	30	40	212	283	526	129	608	456
	LNB (direct)	707	-	40	-	283	1,873	331	-	1,170
	Biosolids Injection	707	-	23	-	163	-	-	[2]	[2]
	CemStar	707	20	60	141	424	1,599	299	2,121	705
	Mid-Kiln	707	20	50	141	354	2,748	-315	[3]	[3]
	LoTOx™	707	80	90	566	636	-	-	[2]	[2]
	SCR	707		80		566	14,813	4,137	-	7,309
	SNCR	707	30	40	212	283	-	878[3]	4,142	3,102
SO_2	Wet FGD	26	90	99	23	26	9,133	1,370	59,565	52,692
Wet Kiln 5										
NO_x	LNB (indirect)	388	30	40	116	155	526	129	1,112	832
	LNB (direct)	388	-	40	-	155	1,873	331	-	2,135
	Biosolids Injection	388	-	23	-	89	-	-	[2]	[2]
	CemStar	388	20	60	78	233	1,599	299	3,833	1,283
	Mid-Kiln	388	20	50	78	194	2,748	-315	[3]	[3]
	LoTOx™	388	80	90	310	349	-	-	[2]	[2]
	SCR	388	30	40	116	155	-	878[3]	7,569	5,665
	SNCR	388		80	-	310	14,813	4,137	-	13,345
SO_2	Wet FGD	431	90	99	388	427	9,133	1,370	3,531	3,208

[1]South Dakota also did an analysis based on operating scenario with 50% fewer hours based on last five years of actual operations showing all costs would still be economical.
[2]The EC/R report did not list a cost per ton because it did not identify any capital or annual costs.
[3]South Dakota did not list a cost per ton because the annual cost was a negative number.

Time Necessary for Compliance

While the State did not provide specifics on the time necessary for compliance, the EC/R report upon which the State relied for other aspects of its four-factor analysis found that up to 6.5 years after SIP approval would be necessary to achieve compliance with some of the control options. The State did not identify the time necessary for compliance as a factor that would preclude selection of any of the analyzed control options.

Energy and Non-Air Quality Impacts

The State did not identify any energy or non-air quality impacts that would preclude selection of any of the analyzed control options. The EC/R report upon which the state relied for

other aspects of its four-factor analysis describes the various potential energy and non-air quality impacts of various control technologies in general terms for consideration.

Remaining Useful Life of the Source

South Dakota found the remaining useful life would be at least 10 years for the Black Hills, Ben French Power Plant but also considered a 30 year life in its cost analysis. South Dakota used a remaining useful life of at least 30 years for the GCC Dacotah Cement Plant Kiln 4 and Kiln 5 but generally questioned the accuracy of this based on much reduced operations over the past five years.

Visibility Improvement

In addition to evaluating the four statutory factors, South Dakota also considered the baseline visibility impacts for each RP source based on maximum 24-hour emission rates for meteorological years 2002, 2006, and 2007 compared to natural background. The CALPUFF modeling results for Black Hills Ben French and GCC Dacotah are summarized in Tables 18 and 19 below. The modeling reports are available in Appendices G and H of the SIP.

Table 18. Summary of Baseline Visibility Impacts from Reasonable Progress Source Black Hills Ben French Unit 1 Boiler (98^{th} Percentile, dv)

Year	Badlands	Wind Cave
2002	0.21	0.22
2006	0.23	0.23
2007	0.20	0.30

Table 19. Summary of Baseline Visibility Impacts from Reasonable Progress Source GCC Dacotah Kilns 4 and 5 (98^{th} Percentile, dv)

Year	Badlands	Wind Cave
2002	0.32	0.36
2006	0.32	0.36
2007	0.31	0.46

3. South Dakota's Conclusions from the Four-Factor Analysis

South Dakota declined to conduct a four-factor analysis for GCC Dacotah Kiln 6. In addressing a concern raised by the National Park Service[20] during the public comment period for the GCC Dacotah Cement Plant, South Dakota provided an explanation in an email to EPA regarding its decision not to include GCC Dacotah's Kiln 6 in its four-factor analysis for the facility and specifically, not to impose SNCR controls on that unit.[21] As the State explained, GCC Dacotah submitted a PSD air quality application for an upgrade to Kiln 6 in November 2001. In issuing the PSD permit in 2003, South Dakota determined NO_x BACT for Kiln 6 was the installation of staged combustion with a thermal efficient in-line low-NO_x calciner complimented by a LNB with indirect firing in the kiln; South Dakota found that SNCR was not technically feasible for Kiln 6. GCC Dacotah installed the required NOx BACT controls. South Dakota also determined SO_2 BACT for Kiln 6 and imposed a corresponding emissions limit.

Based on the baseline visibility impacts, the State concluded that visibility benefits from controls at Ben French and GCC Dacotah would be small. Given the small benefits, the State concluded that additional controls during this planning period would not be warranted to achieve reasonable progress. The State did not include a discussion of its four-factor analyses in explaining the basis for its conclusion that additional controls are unwarranted but instead based its determination on the modeling of baseline visibility impacts.

4. Establishment of the Reasonable Progress Goals

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[20] The National Park Service commented that South Dakota's reasonable progress analysis should also include Kiln #6 at GCC Dacotah as the National Park Service believes SNCR technology is a feasible control option for cement kilns. August 17, 2011 letter from NPS, John Bunyak to DENR, Rick Boddicker. This letter is included in the docket.

[21] Email from Rick Boddicker, DENR to Gail Fallon, EPA Region 8 (October 11, 2011). This email is included in the docket.

40 CFR 308(d)(1) of the Regional Haze Rule requires states to "establish goals (in deciviews) that provide for reasonable progress towards achieving natural visibility conditions" for each Class I area of the state. These reasonable progress goals are interim goals that must provide for incremental visibility improvement for the most impaired visibility days, and ensure no degradation for the least impaired visibility days. The reasonable progress goals for the first planning period are goals for the year 2018.

Based on (1) the results of the WRAP CMAQ modeling; (2) the results of the four-factor analysis of major South Dakota sources; and (3) the emission controls on South Dakota BART sources, South Dakota established reasonable progress goals for the most impaired days for both of South Dakota's Class I areas, as identified in Table 20 below. Also shown in Table 20 is a comparison of the reasonable progress goals to the uniform rate of progress for both Class I areas. The reasonable progress goals for the 20% worst days fall short of the uniform rate of progress by 1.28 and 1.34 deciviews for Badlands and Wind Cave, respectively.

Table 20. Comparison of Reasonable Progress Goals to Uniform Rate of Progress on Most Impaired Days for South Dakota Class I Areas

South Dakota Class I Area	Visibility Conditions on 20% Worst Days (dv)			Percentage of URP Achieved
	Average for 20% Worst Days (Baseline 2000-2004)	2018 URP Goal	RPG (WRAP Projection)	
Badlands National Park	17.14	15.02	16.30	40%
Wind Cave National Park	15.84	13.94	15.28	29%

South Dakota's reasonable progress goals for Badlands for 2018 for the 20% worst days represent a 0.84 deciviews improvement over baseline and its reasonable progress goals for Wind Cave for 2018 represent a 0.56 deciviews improvement over baseline. South Dakota's reasonable progress goals establish a slower rate of progress than the uniform rate of progress. South Dakota has calculated that under the rate of progress represented by its reasonable progress goals, South Dakota would attain natural visibility conditions in the year 2265 for Badlands and 2236 for Wind Cave, or 201 and 172 years, respectively, beyond 2064.

Table 21 provides a comparison of South Dakota's reasonable progress goals to baseline conditions on the least impaired days. This comparison demonstrates that South Dakota's reasonable progress goals will result in no degradation in visibility conditions in the first planning period; instead, for the 20% best days, there would be a slight improvement in visibility from the baseline for both Class I areas.

Table 21. Comparison of Reasonable Progress Goals to Baseline Conditions on Least Impaired Days for South Dakota Class I Areas

South Dakota Class I Area	Visibility Conditions on 20% Best Days (dv)		Achieved "No Degradation" (Y/N)
	Average for 20% Best Days (Baseline 2000-2004)	RPG (WRAP Projection)	
Badlands National Park	6.89	6.64	Y
Wind Cave National Park	5.14	5.02	Y

South Dakota believes the reasonable progress goals it established for the South Dakota Class I areas are reasonable, and that it is not reasonable to achieve the glide path in 2018, based

on the State's findings from the four-factor analysis combined with its visibility analyses that indicate the benefit would be small.

5. Reasonable Progress Consultation

In accordance with 40 CFR 51.308(d)(3)(i) and (ii), each state that causes or contributes to impairment in a Class I area in another state or states is required to consult with other states and demonstrate that it has included in its SIP all measures necessary to obtain its share of the emission reductions needed to meet the progress goals for the Class I area. If the state has participated in a regional planning process, the state must ensure it has included all measures needed to achieve its apportionment of emission reduction obligations agreed upon through that process.

South Dakota consulted directly with neighboring states through the WRAP, and relied on the technical tools, policy documents, and other products that all western states used to develop their regional haze plans. Discussions with neighboring states included review of major contributing sources of air pollution, as documented in numerous WRAP reports and projects. The focus of this review process was interstate transport of emissions, major sources believed to be contributing, and whether any mitigation measures were needed. All the states relied upon similar emission inventories, results from source apportionment studies and BART modeling, review of IMPROVE monitoring data, existing state smoke management programs, and other information in assessing the extent to which each state contributes to visibility impairment other states' Class I areas.

The WRAP Implementation Work Group was one of the primary collaboration mechanisms. South Dakota participated in WRAP and worked with other states that are not members of WRAP (including Minnesota and Nebraska) in developing its SIP. Otter Tail Power

Company's Big Stone I facility is the only source in South Dakota that is reasonably anticipated to contribute to visibility impairment with visibility impacts greater than 0.5 deciviews at a Class I area. This facility is predicted to contribute to visibility impairment at the Badlands National Park in South Dakota; Theodore Roosevelt National Park in North Dakota; Boundary Waters Canoe Area Wilderness and Voyageurs National Park in northern Minnesota and the Isle Royale National Park in Michigan. Otter Tail Power Company developed a case-by-case BART analysis that South Dakota reviewed to establish the BART emission limits for Big Stone I. The case-by-case BART analysis and South Dakota's review were submitted to the appropriate states for their comments. South Dakota established BART procedures in the Administrative Rules of South Dakota that are equivalent to federal regulation in 40 CFR part 51 and adopted the BART emission limits and monitoring recordkeeping and reporting requirements applicable to BART-eligible coal fired power plants (which includes Big Stone I) in the rule. The requirements will eventually be adopted in Otter Tail Power Company's Title V air quality operating permit for the Big Stone I facility. South Dakota believes the BART requirements represent South Dakota's fair share of emission reductions for Class I areas impacted by emissions from South Dakota sources and other states provided no adverse comments.

40 CFR 51.308(d)(3)(ii) of the Regional Haze Rule requires a state to demonstrate that its regional haze plan includes all measures necessary to obtain its fair share of emission reductions needed to meet reasonable progress goals. Based on the consultation described above, South Dakota identified no major contributions that supported developing new interstate strategies, mitigation measures, or emission reduction obligations. Both South Dakota and neighboring states agreed that the implementation of BART and other existing measures in state regional haze

plans were sufficient for the states to meet the reasonable progress goals for their Class I areas, and that future consultation would address any new strategies or measures needed.

6. Our Conclusion on South Dakota's Reasonable Progress Goals

We are proposing to approve South Dakota's conclusion that it is not reasonable to meet the uniform rate of progress for Badlands and Wind Cave by 2018. Where a state has established a reasonable progress goal that provides for a slower rate of improvement in visibility than the rate that would be needed to attain natural conditions by 2064, the state must demonstrate, based on the four statutory factors that the rate of progress for the implementation plan to attain natural conditions by 2064 is not reasonable and that the progress goal adopted by the State is reasonable. While South Dakota undertook a four-factor analyses which it described in its SIP, the State made the determination not to impose additional controls for reasonable progress at the facilities in South Dakota most likely to have the largest source-specific impacts. The State based that determination on the modeled baseline visibility impacts for the facilities.

EPA proposes to approve the State's determination that it is not reasonable to achieve the uniform rates of progress at Badlands and Wind Cave and that the reasonable progress goals adopted by the State are reasonable based on consideration of the following:

a. Findings from the four-factor analysis along with the State's baseline visibility analyses indicate likely visibility benefits from the most cost-effective controls would be small.
b. Sources outside South Dakota -- including other states and Canada -- contribute most of the visibility impairing pollutants at Class I areas in South Dakota, with South Dakota's emissions ranging from 2 to 18 percent of the total emissions for each type of pollutant.
c. On the 20 percent most impaired days, sulfate and organic carbon are the two greatest contributors to visibility impairment at both Class I areas. The four-factor analyses

performed by the State show the costs for controlling SO_2 at these facilities is excessive, given the minimal visibility benefits from such controls. Much of the organic carbon emissions are from natural fires that cannot be controlled.

d. Although, as noted in Table 20 above, the reasonable progress goals for Badlands and Wind Cave fall short of the uniform rate of progress, these goals are based on the WRAP CMAQ modeling and the WRAP 2018 projections. As South Dakota discussed in the SIP, the WRAP 2018 projections overestimated emissions of visibility-impairing pollutants from sources in South Dakota. It is therefore likely that the actual rate of progress will be closer to the uniform rate of progress.

We also agree with South Dakota's conclusion that it appropriately consulted with other states for this planning period. We also agree with South Dakota's determination that it needed no further controls beyond those already contained in the SIP to address impacts on Class I areas in other states. Finally, we are proposing to approve South Dakota's conclusion that no additional controls on non-BART sources are needed at this time. We expect South Dakota to evaluate additional controls for the sources below and other sources during the next regional haze planning period.

Below we discuss each reasonable progress source and EPA's conclusions regarding the State's reasonable progress determination.

Black Hills, Ben French Unit 1

EPA is proposing to approve the State's conclusion that no additional SO_2 controls are warranted for this unit for this planning period. The cost effectiveness values range from $3,777 for a spray dryer absorber to $21,519 per ton for the least efficient dry sorbent injection option. Based on the cost effectiveness values and the minimal visibility benefits from controlling this

unit, we find that South Dakota reasonably rejected additional SO_2 controls during this planning period.

EPA is proposing to approve the State's conclusion that no additional NO_x controls are warranted for this unit for this planning period. The cost effectiveness values range from $287 for LNB to $2,942 per ton for SCR. Some of these costs are reasonable. However, South Dakota also considered the visibility impacts – it modeled visibility impacts of 0.23 deciviews at Badlands and 0.30 deciviews at Wind Cave from all emissions from the source -- and any visibility improvement that would result from additional NO_x controls alone would be significantly less than these values. When the costs are weighed against visibility improvement, South Dakota's determination that additional controls of NO_x are not warranted in this planning period is reasonable, and we are proposing to approve it.

GCC Dacotah Kilns 4, 5, and 6

EPA is proposing to approve the State's conclusion that no additional SO_2 controls are warranted for Kilns 4 and 5 for this planning period. The cost effectiveness values for a new wet FGD system range from $52,692 to $59,565 per ton on Kiln 4 and from $3,208 to $3,531 per ton on Kiln 5. Based on the cost effectiveness values and South Dakota's modeling of baseline visibility impacts from Kilns 4 and 5, we find that South Dakota reasonably rejected additional SO_2 controls during this planning period.

EPA is proposing to approve the State's conclusion that no additional NO_x controls for Kilns 4 and 5 are reasonable for this planning period. For Kiln 4, the cost effectiveness values range from $456 per ton for LNB to $7,309 per ton for SCR. For Kiln 5 the cost effectiveness values range from $832 per ton for LNB to $13,345 per ton for SCR. Some of these costs are reasonable. However, South Dakota modeled the baseline visibility impacts from Kilns 4 and 5

combined – 0.32 deciviews at Badlands and 0.46 at Wind Cave – and any visibility benefits that would result from additional NO_x controls alone would be significantly less than these values. We therefore propose to find that South Dakota reasonably rejected additional NO_x controls during this planning period.

EPA is also proposing to approve the State's determination that no additional NO_x or SO_2 controls are required on Kiln 6. During this planning period, it is reasonable for the State to rely on the relatively recent NO_x and SO_2 BACT determinations in the 2003 PSD permit for Kiln 6. However, during the next planning period, the State should reconsider these determinations.

E. LTS

As described in section II.E of this action, the LTS is a compilation of state-specific control measures relied on by the state for achieving its reasonable progress goals. The LTS must include "enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals" for all Class I areas within, or affected by emissions from, the state. 40 CFR 51.308(d)(3). South Dakota's LTS for the first implementation period addresses the emissions reductions from federal, state and local controls that take effect in the state from the end of the baseline period starting in 2004 until 2018. The South Dakota LTS was developed by South Dakota, in coordination with the WRAP, through an evaluation of the following components: (1) WRAP emission inventories for a 2002 baseline and a 2018 projection (including reductions from WRAP member state controls required or expected under federal and state regulations (including BART)); (2) modeling to determine visibility improvement and apportion individual state contributions; (3) state consultation; and (4) application of the LTS factors. The State's detailed LTS is included in Section 8 of the Regional Haze SIP.

1. Emissions Inventories

40 CFR 51.308(d)(3)(iii) requires that South Dakota document the technical basis, including modeling, monitoring, and emissions information, on which it relied to determine its apportionment of emission reduction obligations necessary for achieving reasonable progress in each mandatory Class I federal area it affects. South Dakota must identify the baseline emissions inventory on which its strategies are based. 40 CFR 51.308(d)(3)(iv) requires that South Dakota identify all anthropogenic (human-caused) sources of visibility impairment it considered in developing its LTS. This includes major and minor stationary sources, mobile sources, and area sources. In its efforts to meet these requirements, South Dakota relied on technical analyses developed by WRAP and approved by all state participants, as described below.

Emissions within South Dakota are both naturally occurring and man-made. Two primary sources of naturally occurring emissions include wildfires and windblown dust. In South Dakota, the primary sources of anthropogenic emissions include electric utility steam generating units, energy production and processing sources, agricultural production and processing sources, prescribed burning, and fugitive dust sources. The South Dakota inventory includes emissions of SO_2, NO_x, $PM_{2.5}$, PM_{10}, primary organic aerosol, elemental carbon, VOCs, NH_3, and CO. See Section 5 of the SIP.

An emissions inventory for each pollutant was developed by WRAP for South Dakota for the baseline year 2002 and for 2018, which is the first reasonable progress milestone.[22] The 2018 emissions inventory was developed by projecting 2002 emissions and applying reductions expected from federal and state regulations. The emission inventories developed by WRAP were calculated using approved EPA methods.

[22] These inventories, in addition to being available in Section 5 of the SIP, are also available at http://vista.cira.colostate.edu/TSS/Results/HazePlanning.aspx .

There are 10 different emission inventory source categories identified in the South Dakota regional haze Plan: point, area, oil and gas, on-road, off-road, all fire, biogenic, road dust, fugitive dust and windblown dust. Tables 22 through 30 show the 2002 baseline emissions, the 2018 projected emissions, and net changes of emissions for SO_2, NO_x, primary organic aerosol, elemental carbon, $PM_{2.5}$, PM_{10}, NH_3, VOC and carbon monoxide (CO) by source category in South Dakota. The methods that WRAP used to develop these emission inventories are described in more detail in Section 5 of the SIP and in the EPA WRAP Technical Support Document (TSD).

Table 22. South Dakota SO_2 Emission Inventory – 2002 and 2018[1]

South Dakota Statewide SO_2 Emissions (tons/year)				
Source Category	**Baseline 2002**	**Future 2018**	**Net Change**	**Percent Change**
Point	14,037	11,996	-2,041	-15
Big Stone I[2]	11,171	3,425	-7,746	-69
All Fire	469	465	-4	-1
Biogenic	0	0	0	0
Area	1,198	1,789	591	49
Oil and Gas	6	0	-6	-100
On-Road Mobile	922	129	-793	-86
Off-Road Mobile	6,066	199	-5,867	-97
Road Dust	4	5	1	25
Fugitive Dust	24	26	2	8
Wind Blown Dust	0	0	0	0
Total	22,726	14,609	-8,117	-36

[1] SO_2 emissions shown include both gas and particulate.
[2] Otter Tail Power Company's Big Stone I emissions are included in the "Point" emissions but separated for comparison.

In 2018, South Dakota's sulfate contribution switched mainly to point and area sources, and like other states and regions in the United States, mobile source contributions are minimal due to new changes in federal emission standards from mobile sources.

Table 23. South Dakota NO_x Emission Inventory – 2002 and 2018[1]

South Dakota Statewide NO_x Emissions (tons/year)				
Source Category	**Baseline 2002**	**Future 2018**	**Net Change**	**Percent Change**
Point	20,699	30,186	9,487	46
Big Stone I[2]	14,552	15,323	771	5
All Fire	1,713	1,694	-19	-1
Biogenic	52,852	52,852	0	0
Area	2,903	3,309	406	14
Oil and Gas	361	557	196	54
On-Road Mobile	29,224	8,059	-21,165	-72
Off-Road Mobile	39,039	23,785	-15,254	-39
Road Dust	5	6	1	20
Fugitive Dust	27	27	0	0
Wind Blown Dust	0	0	0	0
Total	146,823	120,475	-26,348	-18

[1] NO_x emissions shown include both gas and particulate.
[2] Otter Tail Power Company's Big Stone I emissions are included in the "Point" emissions row but separated for comparison.

Table 24. South Dakota Primary Organic Aerosol Emission Inventory – 2002 and 2018

South Dakota Statewide Primary Organic Aerosol Emissions (tons/year)				
Source Category	**Baseline 2002**	**Future 2018**	**Net Change**	**Percent Change**
Point	10	8	-2	-20
Big Stone I[1]	0	0	0	
All Fire	4,574	4,531	-43	-1
Biogenic	0	0	0	

Area	1,792	1,769	-23	-1
Oil and Gas	0	0	0	
On-Road Mobile	278	270	-8	-3
Off-Road Mobile	942	386	-556	-59
Road Dust	255	325	70	27
Fugitive Dust	1,317	1,322	5	0
Wind Blown Dust	0	0	0	
Total	9,168	8,611	-557	-6

[1]Otter Tail Power Company's Big Stone I emissions are included in the "Point" emissions but separated for comparison.

Table 25. South Dakota Elemental Carbon Emission Inventory – 2002 and 2018

South Dakota Statewide Elemental Carbon Emissions (tons/year)				
Source Category	**Baseline 2002**	**Future 2018**	**Net Change**	**Percent Change**
Point	0	0	0	0
All Fire	717	715	-2	0
Biogenic	0	0	0	0
Area	306	314	8	0
Area Oil and Gas	0	0	0	0
On-Road Mobile	339	86	-253	-75
Off-Road Mobile	3,234	1,072	-2,162	-67
Road Dust	18	23	5	28
Fugitive Dust	89	90	1	1
Wind Blown Dust	0	89	89	Greater than 100
Total	4,703	2,389	-2,314	-49

As detailed in Tables 26 and 27, the primary sources of PM (both $PM_{2.5}$ and PM_{10}) are road, fugitive and windblown dust (agriculture, construction, and unpaved and paved roads).

Table 26. South Dakota $PM_{2.5}$ Emission Inventory – 2002 and 2018

South Dakota Statewide $PM_{2.5}$ Emissions (tons/year)				
Source Category	**Baseline 2002**	**Future 2018**	**Net Change**	**Percent Change**
Point	216	205	-11	-5
Big Stone I[1]	209	0	-209	-100
All Fire	839	821	-18	-2
Biogenic	0	0	0	0
Area	1,804	1,920	116	6
Area Oil and Gas	0	0	0	0
On-Road Mobile	0	0	0	0
Off-Road Mobile	0	0	0	0
Road Dust	4,061	5,190	1,129	28
Fugitive Dust	25,220	25,840	620	2
Wind Blown Dust	50,274	50,274	0	0
Total	82,414	84,250	-11	-5

[1]Otter Tail Power Company's Big Stone I emissions are included in the "Point" emissions but separated for comparison.

Table 27. South Dakota PM_{10} Emission Inventory – 2002 and 2018

South Dakota Statewide PM_{10} Emissions (tons/year)				
Source Category	**Baseline 2002**	**Future 2018**	**Net Change**	**Percent Change**
Point	727	9,847	9,120	Greater than 100
Big Stone I[1]	209	318	109	52
All Fire	754	751	-3	0
Biogenic	0	0	0	0
Area	156	190	34	22
Area Oil and Gas	0	0	0	0
On-Road Mobile	169	188	19	0
Off-Road Mobile	0	0	0	0

Road Dust	38,164	48,773	10,609	28
Fugitive Dust	122,914	129,009	6,095	5
Wind Blown Dust	452,470	452,470	0	0
Total	615,354	641,228	25,874	4

[1]Otter Tail Power Company's Big Stone I emissions are included in the "Point" emissions but separated for comparison.

Table 28. South Dakota NH_3 Emission Inventory – 2002 and 2018

South Dakota Statewide NH_3 Emissions (tons/year)				
Source Category	**Baseline 2002**	**Future 2018**	**Net Change**	**Percent Change**
Point	100	102	2	2
Big Stone I[1]	29	0	-29	-100
All Fire	562	553	-9	-2
Biogenic	0	0	0	0
Area	118,877	118,992	115	0
Area Oil and Gas	0	0	0	0
On-Road Mobile	842	1,075	233	0
Off-Road Mobile	25	36	11	0
Road Dust	0	0	0	0
Fugitive Dust	0	0	0	0
Wind Blown Dust	0	0	0	0
Total	120,406	120,758	352	0

[1]Otter Tail Power Company's Big Stone I emissions are included in the "Point" emissions but separated for comparison.

Table 29. South Dakota VOC Emission Inventory – 2002 and 2018

South Dakota Statewide VOC Emissions (tons/year)				
Source Category	**Baseline 2002**	**Future 2018**	**Net Change**	**Percent Change**
Point	2,542	4,510	1,968	77
Big Stone I[1]	107	112	5	5

All Fire	3,853	3,808	-45	-1
Biogenic	445,241	445,241	0	0
Area	40,511	49,659	9,148	23
Area Oil and Gas	33,721	562	-33,159	0
On-Road Mobile	13,741	5,101	-8,640	0
Off-Road Mobile	12,764	7,686	-5,078	0
Road Dust	0	0	0	0
Fugitive Dust	0	0	0	0
Wind Blown Dust	0	0	0	0
Total	552,373	516,567	-35,806	-6

[1]Otter Tail Power Company's Big Stone I emissions are included in the "Point" emissions but separated for comparison.

Table 30. South Dakota CO Emission Inventory – 2002 and 2018

South Dakota Statewide CO Emissions (tons/year)				
Source Category	**Baseline 2002**	**Future 2018**	**Net Change**	**Percent Change**
Point	4,700	16,632	11,932	Greater than 100
Big Stone I[1]	490	509	19	4
All Fire	64,326	63,843	-483	-1
Biogenic	103,402	103,402	0	0
Area	23,029	23,773	744	3
Area Oil and Gas	11	16	5	0
On-Road Mobile	221,726	120,041	-101,685	0
Off-Road Mobile	92,508	95,276	2,768	0
Road Dust	0	0	0	0
Fugitive Dust	0	0	0	0
Wind Blown Dust	0	0	0	0

Total	509,702	422,983	-86,719	-17

[1]Otter Tail Power Company's Big Stone I emissions are included in the "Point" emissions but separated for comparison.

2. Sources of Visibility Impairment in South Dakota Class I Areas

In order to determine the significant sources contributing to haze in South Dakota's Class I areas, South Dakota relied upon two source apportionment analysis techniques developed by the WRAP. The first technique was regional modeling using the Comprehensive Air Quality Model (CAMx) and the PM Source Apportionment Technology (PSAT) tool, used for the attribution of sulfate and nitrate sources only. The second technique was the Weighted Emissions Potential (WEP) tool, used for attribution of sources of organic carbon, elemental carbon, $PM_{2.5}$ and PM_{10}. The WEP tool is based on emissions and residence time, not modeling.

PSAT uses the CAMx air quality model to show nitrate-sulfate-ammonia chemistry and apply this chemistry to a system of tracers or "tags" to track the chemical transformations, transport, and removal of NO_x and SO_2. These two pollutants are important because they tend to originate from anthropogenic sources. Therefore, the results from this analysis can be useful in determining contributing sources that may be controllable, both in-state and in neighboring states.

WEP is a screening tool that helps to identify source regions that have the potential to contribute to haze formation at specific Class I areas. Unlike PSAT, this method does not account for chemistry or deposition. The WEP combines emissions inventories, wind patterns and residence times of air masses over each area where emissions occur, to estimate the percent contribution of different pollutants. Like PSAT, the WEP tool compares baseline values (2000-2004) to 2018 values, to show the improvement expected by 2018, for sulfate, nitrate, organic

carbon, elemental carbon, $PM_{2.5}$ and PM_{10}. More information on the WRAP modeling methodologies is available in the EPA WRAP TSD.

The PSAT and WEP results for South Dakota are provided in Sections 4 and 5 of the SIP. See the EPA WRAP TSD for details on how the 2018 emissions inventory was constructed. WRAP and South Dakota used this inventory and other states' 2018 emission inventories to construct visibility projection modeling for 2018.

3. Visibility Projection Modeling

The Regional Modeling Center (RMC) at the University of California Riverside, under the oversight of the WRAP Modeling Forum, performed modeling for the regional haze LTS for the WRAP member states, including South Dakota. The modeling analysis is a complex technical evaluation that began with selection of the modeling system. The RMC primarily used the CMAQ photochemical grid model to estimate 2018 visibility conditions in South Dakota and all western Class I areas, based on application of the regional haze strategies in the various state plans, including assumed controls on BART sources.

The RMC developed air quality modeling inputs, including annual meteorology and emissions inventories for: (1) a 2002 actual emissions base case; (2) a planning case to represent the 2000-2004 regional haze baseline period using averages for key emissions categories; and (3) a 2018 base case of projected emissions determined using factors known at the end of 2005. All emission inventories were spatially and temporally allocated using the SMOKE modeling system. Each of these inventories underwent a number of revisions throughout the development process to arrive at the final versions used in CMAQ modeling. The WRAP states' modeling

was developed in accordance with our guidance.[23] A more detailed description of the CMAQ modeling performed for the WRAP can be found in Section 5 of the SIP and in the EPA WRAP TSD.

The photochemical modeling of regional haze for the WRAP states for 2002 and 2018 was conducted on the 36-km resolution national regional planning organization domain that covered the continental United States, portions of Canada and Mexico, and portions of the Atlantic and Pacific Oceans along the east and west coasts. The RMC examined the model performance of the regional modeling for the areas of interest before determining whether the CMAQ model results were suitable for use in the regional haze assessment of the LTS and for use in the modeling assessment. The 2002 modeling efforts were used to evaluate air quality/visibility modeling for a historical episode—in this case, for calendar year 2002—to demonstrate the suitability of the modeling systems for subsequent planning, sensitivity and emissions control strategy modeling. Model performance evaluation compares output from model simulations with ambient air quality data for the same time period to determine whether model performance is sufficiently accurate to justify using the model to simulate future conditions. Once the RMC determined that model performance was acceptable, it used the model to determine the 2018 reasonable progress goals using the current and future year air quality modeling predictions, and compared the reasonable progress goals to the uniform rate of progress.

4. Consultation and Emissions Reductions for Other States' Class I Areas

40 CFR 51.308(d)(3)(i) requires that South Dakota consult with another state if its

[23] Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze, (EPA-454/B-07-002), April 2007, located at http://www.epa.gov/scram001/guidance/guide/final-03-pm-rh-guidance.pdf
Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations, August 2005, updated November 2005 ("our Modeling Guidance"), located at http://www.epa.gov/ttnchie1/eidocs/eiguid/index.html, EPA-454/R-05-001.

emissions are reasonably anticipated to contribute to visibility impairment in that state's Class I area(s), and that South Dakota consult with other states if those other states' emissions are reasonably anticipated to contribute to visibility impairment at Badlands or Wind Cave. South Dakota's consultations with other states are described in section III.D.5 above. After evaluating whether emissions from South Dakota sources contribute to visibility impairment in other states' Class I areas, South Dakota concluded that Otter Tail Power Company's Big Stone I facility was the only source in South Dakota that is reasonably anticipated to contribute to visibility impairment of a Class I are in another state. South Dakota's evaluation relied upon NO_x and SO_2 BART and reasonable progress reductions as described in the SIP. South Dakota did consult with other states and tribes, largely through the WRAP process, in order to meet the regulatory requirements. South Dakota also worked with states that are not members of WRAP including Minnesota and Nebraska.

40 CFR 51.308(d)(3)(ii) requires that if South Dakota emissions cause or contribute to impairment in another state's Class I area, South Dakota must demonstrate that it has included in its Regional Haze SIP all measures necessary to obtain its share of the emission reductions needed to meet the progress goal for that Class I area. Section 51.308(d)(3)(ii) also requires that, since South Dakota participated in a regional planning process, it must ensure it has included all measures needed to achieve its apportionment of emission reduction obligations agreed upon through that process. As we state in the Regional Haze Rule, South Dakota's commitments to participate in WRAP bind it to secure emission reductions agreed to as a result of that process, unless it proposes a separate process and performs its consultations on the basis of that process. See 64 FR 35735.

South Dakota accepted and incorporated the WRAP-developed visibility modeling into

its Regional Haze SIP, and the Regional Haze SIP includes the controls assumed in the modeling. South Dakota satisfied the Regional Haze Rule's requirements for consultation and included controls in the SIP sufficient to address the relevant requirements of the Regional Haze Rule related to impacts on Class I areas in other states.

5. Mandatory LTS Factors

40 CFR 51.308(d)(3)(v) requires that South Dakota, at a minimum, consider certain factors in developing its LTS. The LTS factors are: (a) emission reductions due to ongoing air pollution control programs, including measures to address RAVI; (b) measures to mitigate the impacts of construction activities; (c) emissions limitations and schedules for compliance to achieve the reasonable progress goals; (d) source retirement and replacement schedules; (e) smoke management techniques for agricultural and forestry management purposes including plans as currently exist within the state for these purposes; (f) enforceability of emissions limitations and control measures; and (g) the anticipated net effect on visibility due to projected changes in point, area and mobile source emissions over the period addressed by the LTS.

a. Reductions Due to Ongoing Air Pollution Programs

In addition to its BART determinations, South Dakota's LTS incorporates emission reductions due to a number of ongoing air pollution control programs.

i. PSD/New Source Review Rules

The two primary regulatory tools for addressing visibility impairment from industrial sources are BART and the PSD New Source Review rules. The PSD rules protect visibility in Class I areas from new industrial sources and major changes to existing sources. South Dakota's Air Pollution Control Rules (ARSD Chapter 74:36) contain requirements for visibility impact assessment and mitigation associated with emissions from new and modified major stationary

sources. A primary responsibility of South Dakota under these rules is visibility protection. Chapter 74:36:09 and 74:36:10 describes mechanisms for visibility impact assessment and review by South Dakota, as well as impact modeling methods and requirements. Typically, this modeling is conducted for sources within 300 kilometers of a Class I area. South Dakota will not issue an air quality permit to any new major source or major modification within this distance that is found through modeling to cause significant visibility impairment, unless the impact is mitigated.

ii. South Dakota's Phase I Visibility Protection Program

EPA implemented a RAVI protection program in 1987 with a Federal Implementation Plan (FIP) for South Dakota to meet the general visibility plan requirements and long-term strategies of 40 CFR 51.302 and 51.306, respectively. The existing federal RAVI program is compatible with the regional haze program and no revisions are needed at this time. South Dakota indicated in the SIP that it will coordinate with EPA to conduct joint periodic reviews and revisions of the long-term RAVI strategy as required by 40 CFR 51.306(c). South Dakota noted in its Regional Haze Plan that it may consider incorporation of the RAVI program into South Dakota's SIP in the future. See Section 8.5.1 of the SIP.

iii. On-going Implementation of State and Federal Mobile Source Regulations

Mobile source annual emissions show a major decrease in NO_x in South Dakota from 2002 to 2018. See Table 23 above. This reduction will result from numerous "on the books" federal mobile source regulations. This trend is expected to provide significant visibility benefits. Beginning in 2006, EPA mandated new standards for on-road (highway) diesel fuel, known as ultra-low sulfur diesel. This regulation dropped the sulfur content of diesel fuel from 500 parts per million (ppm) to 15 ppm. Ultra-low sulfur diesel fuel enables the use of cleaner

technology diesel engines and vehicles with advanced emissions control devices, resulting in significantly lower emissions.

Diesel fuel intended for locomotive, marine, and non-road (farming and construction) engines and equipment was required to meet a low sulfur diesel fuel maximum specification of 500 ppm sulfur in 2007 (down from 5000 ppm). By 2010, the ultra-low sulfur diesel fuel standard of 15 ppm sulfur applied to all non-road diesel fuel. Locomotive and marine diesel fuel will be required to meet the ultra-low sulfur diesel standard beginning in 2012, resulting in further reductions of diesel emissions.

b. Measures to Mitigate the Impacts of Construction Activities

In developing its LTS, South Dakota has considered the impact of construction activities. Based on general knowledge of construction activity in the state, and without conducting extensive research on the contribution of emissions from construction activities to visibility impairment in South Dakota Class I areas, South Dakota found that current state regulations adequately address construction activities. Current rules addressing impacts from construction activities in South Dakota include ARSD 74:36:18, which regulates fugitive dust emissions for facilities in the Rapid City area.

c. Emission Limitation and Schedules of Compliance

The SIP contains emission limits and schedules of compliance for the one source subject to BART -- Otter Tail Power Company's Big Stone I. The schedule for implementation of BART for this source is identified in Section 6.4 of the SIP and in State rule ARSD 74:36:21 that we are proposing to approve with this SIP.

d. Source Retirement and Replacement Schedules

The State does not anticipate major source retirements or replacements. Replacement of existing facilities will be managed according to the State's existing SIP. The 2018 modeling that WRAP conducted included emissions from two proposed coal-fired power plants and one proposed oil refinery in South Dakota. Although the PSD permit has been issued for one of the proposed coal-fired power plants, the applicant notified South Dakota that it is no longer going to build the plant. The second coal-fired power plant requested that South Dakota put its application on hold until further notice. Therefore, the next modeling exercise for determining visibility in 2018 will need to be adjusted to reflect these developments, and the current modeling results for 2018 are potentially conservative.

e. Agricultural and Forestry Smoke Management Techniques

40 CFR 308(d)(3)(v)(E) of the Regional Haze Rule requires the LTS to address smoke management techniques for agricultural and forestry burning. As part of the long term strategy, South Dakota will investigate the impacts that a smoke management plan for wild fires and prescribed burns will have on the 20% most impaired days within the first planning period of 2013. Currently very little agricultural burning takes place in South Dakota and the majority of agricultural land lies in the eastern two-thirds of the State, while both Class I areas are in the western third. In addition, South Dakota did not observe any of the 20% most impaired days that were attributed to agricultural burning in the eastern half of South Dakota. Therefore, agricultural burning does not appear to have much of an impact on visibility at South Dakota's Class I areas. However, there is some grass burning in and around the Class I areas that South Dakota has committed to investigate to determine if this practice warrants being covered under a smoke management plan. See Section 8.5.5 of the SIP.

Additionally, South Dakota is investigating prescribed burns conducted by the National Park Service and the U.S. Forest Service and the impact of prescribed burns on organic carbon mass, ammonia sulfide, and ammonia nitrate levels. South Dakota has observed there is evidence that fires contributed to the 20% most impaired days during the baseline period.

South Dakota has taken the initial steps in developing a smoke management plan by contacting appropriate groups that will need to collaborate on this effort. South Dakota has been in contact with the South Dakota Division of Wildland Fire Suppression regarding their prescribed fire database to begin assessing the impacts from such fires on visibility at the State's Class I areas. South Dakota will continue working with the FLMs, other state agencies, and local governments during the development and implementation of the smoke management plan.

f. Enforceability of South Dakota's Measures

40 CFR 51.308(d)(3)(v)(F) of the Regional Haze Rule requires states to ensure that emission limitations and control measures used to meet reasonable progress goals are enforceable. In addition to what is required by the Regional Haze Rule, general SIP requirements mandate that the SIP must also include adequate monitoring, recordkeeping, and reporting requirements for the regional haze emission limits and requirements. *See* CAA section 110(a). As noted, the SIP specifies BART emission limits and compliance schedules, and South Dakota has included such limits and compliance schedules in the state regional haze rule, ARSD 74:36:21, included in the regional haze SIP we are proposing to approve. These emission limits apply at all times, including periods of startup, shutdown, and malfunction.[24] In addition to specifying the limits and compliance schedules, the state rule specifies monitoring, recordkeeping and reporting requirements. South Dakota worked closely with EPA in

[24] As noted above, with respect to the PM BART limits for Big Stone I Unit 1, because the SIP does not explicitly exempt emissions during malfunctions from the limits, we interpret the SIP to require compliance with the PM limits at all times (including malfunctions).

developing these requirements. For SO_2 and NO_x limits, South Dakota has required the use of CEMS that must be operated and maintained in accordance with relevant EPA regulations, in particular, 40 CFR part 75. For PM limits, the SIP requires testing in accordance with EPA-approved test methods. The SIP requires that relevant records be kept for five years, and that sources report excess emissions on a quarterly basis.

g. Anticipated Net Effect on Visibility Due to Projected Changes

The anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions during this planning period is addressed in sections III.E.3 above.

6. Our Conclusion on South Dakota's LTS

South Dakota's LTS satisfies the requirements of 40 CFR 51.308(d)(3), and we are proposing to approve it.

F. Coordination of RAVI and Regional Haze Requirements

Our visibility regulations direct states to coordinate their RAVI LTS and monitoring provisions with those for regional haze, as explained in section II.F, above. Under our RAVI regulations, the RAVI portion of a state SIP must address any integral vistas identified by the FLMs pursuant to 40 CFR 51.304. *See* 40 CFR 51.302. An *integral vista* is defined in 40 CFR 51.301 as a "view perceived from within the mandatory Class I federal area of a specific landmark or panorama located outside the boundary of the mandatory Class I federal area." Visibility in any mandatory Class I federal area includes any integral vista associated with that area. The FLMs did not identify any integral vistas in South Dakota. In addition, there have been no certifications of RAVI for South Dakota Class I areas. The South Dakota Regional Haze SIP, in Sections 10.6.1 and 9.0, does address the two requirements regarding coordination of the regional haze LTS and monitoring provisions with the RAVI LTS and monitoring

provisions. As noted in the Regional Haze SIP, South Dakota has made a commitment to coordinate the South Dakota regional haze long term strategy with EPA's RAVI FIP long term strategy. See Section 8.5.1 of the SIP. We propose to find that the Regional Haze SIP appropriately supplements and augments the EPA FIP for RAVI visibility provisions by updating the monitoring and LTS provisions to address regional haze. We discuss the relevant monitoring provisions further below.

G. Monitoring Strategy and Other SIP Requirements

40 CFR 51.308(d)(4) requires that the SIP contain a monitoring strategy for measuring, characterizing, and reporting regional haze visibility impairment that is representative of all mandatory Class I federal areas within the state. This monitoring strategy must be coordinated with the monitoring strategy required in 40 CFR 51.305 for RAVI. As 40 CFR 51.308(d)(4) notes, compliance with this requirement may be met through participation in the IMPROVE network. 40 CFR 51.308(d)(4)(i) further requires the establishment of any additional monitoring sites or equipment needed to assess whether reasonable progress goals to address regional haze for all mandatory Class I federal areas within the state are being achieved. Consistent with EPA's monitoring regulations for RAVI and regional haze, South Dakota indicates in Section 9.0 of the Regional Haze SIP that it will rely on the IMPROVE network for compliance purposes. The IMPROVE monitors at the South Dakota Class I Areas also described in Section 9.0 of the SIP. We propose to find that South Dakota has satisfied the requirements in 40 CFR 51.308(d)(4) enumerated in this paragraph.

40 CFR 51.308(d)(4)(ii) requires that South Dakota establish procedures by which monitoring data and other information are used in determining the contribution of emissions from within South Dakota to regional haze visibility impairment at mandatory Class I federal

areas both within and outside the State. The IMPROVE monitoring program is national in scope, and other states have similar monitoring and data reporting procedures, ensuring a consistent and robust monitoring data collection system. As 40 CFR 51.308(d)(4) indicates, participation in the IMPROVE program constitutes compliance with this requirement. We therefore propose that South Dakota has satisfied this requirement.

40 CFR 51.308(d)(4)(iv) requires that the SIP provide for the reporting of all visibility monitoring data to the Administrator at least annually for each mandatory Class I federal area in the state. To the extent possible, South Dakota should report visibility monitoring data electronically. 40 CFR 51.308(d)(4)(vi) also requires that the SIP provide for other elements, including reporting, recordkeeping, and other measures, necessary to assess and report on visibility. We propose that South Dakota's participation in the IMPROVE network ensures that the monitoring data is reported at least annually and is easily accessible; therefore, such participation complies with this requirement.

40 CFR 51.308(d)(4)(v) requires that South Dakota maintain a statewide inventory of emissions of pollutants that are reasonably anticipated to cause or contribute to visibility impairment in any mandatory Class I federal area. The inventory must include emissions for a baseline year, emissions for the most recent year for which data are available, and estimates of future projected emissions. The State must also include a commitment to update the inventory periodically. Please refer to section III.E.1, above, where we discuss South Dakota's emission inventory. South Dakota states in Section 5.1 of the SIP that it intends to update the South Dakota statewide emissions inventories periodically and review periodic emissions information from other states and future emissions projections. We propose that this satisfies the requirement.

H. FLM Coordination

Badlands and Wind Cave are both managed by the National Park Service, the FLM for these South Dakota Class I areas. Although the FLMs are very active in participating in the regional planning organizations, the Regional Haze Rule grants the FLMs a special role in the review of the regional haze SIPs, summarized in section II.H, above. The FLMs and the state environmental agencies are our partners in the regional haze process.

Under 40 CFR 51.308(i)(2), South Dakota was obligated to provide National Park Service with an opportunity for consultation, in person and at least 60 days prior to holding a public hearing on the Regional Haze SIP. South Dakota sent a draft of its Regional Haze SIP to the National Park Service and other FLMs on January 15, 2010. South Dakota held a public hearing in front of the Board of Minerals and Environment on September 15, 2010. In July 2011, South Dakota provided the FLMs and others a draft of proposed amendments to the Regional Haze SIP. The FLMs provided comments to South Dakota's amended submittal. The State held another public hearing on August 18, 2011.

40 CFR 51.308(i)(3) requires that South Dakota provide in its Regional Haze SIP a description of how it addressed any comments provided by the FLMs. The FLMs communicated to the State (and EPA) their concerns on the January 15, 2010 draft Regional Haze SIP. South Dakota responded to the FLM's comments and concerns in Appendix D of the Regional Haze SIP. The National Park Service commented on the Regional Haze SIP amendment regarding its concerns pertaining to a reasonable progress four-factor analysis to evaluate controls at GCC Dacotah's Kiln 6 and additional consultation with Nebraska on Gerald Gentleman Station. South Dakota provided us with its rationale on GCC Dacotah's Kiln 6 which we discussed in section III.D.2. above. We also noted our agreement with the level of consultation with Nebraska for

this planning period in section III.D.6. above. According to the Regional Haze Rule, South Dakota should consult with Nebraska during the next planning period.

Lastly, 40 CFR 51.308(i)(4) specifies the regional haze SIP must provide procedures for continuing consultation between the state and FLMs on the implementation of the visibility protection program required by 40 CFR 51.308, including development and review of implementation plan revisions and 5-year progress reports, and on the implementation of other programs having the potential to contribute to impairment of visibility in mandatory Class I federal areas. South Dakota commits in Section 10 of its Regional Haze SIP to continue to coordinate and consult with the FLMs as required by 40 CFR 51.308(i)(4). South Dakota states that it intends to consult the FLMs in the development and review of implementation plan revisions; review of progress reports; and development and implementation of other programs that may contribute to impairment of visibility at South Dakota and other Class I areas.

We are proposing that the State complied with the requirements of 40 CFR 51.308(i).

I. Periodic SIP Revisions and Five-Year Progress Reports

South Dakota commits in Section 11 of the SIP to complete items required in the future by the Regional Haze Rule. South Dakota acknowledged its obligation under 40 CFR 51.308(f) to submit periodic progress reports and Regional Haze SIP revisions, with the first report due by July 31, 2018 and every ten years thereafter.

South Dakota acknowledged its obligation under 40 CFR 51.308(g) to submit a progress report in the form of a SIP revision to us every five years following the initial submittal of the Regional Haze SIP. The report will evaluate the progress made towards the reasonable progress goals for each mandatory Class I area located within South Dakota and in each mandatory Class I area located outside South Dakota that may be affected by emissions from within South

Dakota.

IV. Proposed Action

We are proposing to approve South Dakota's Regional Haze SIP revision, including ARSD Chapter 74:36:21, that was submitted on January 21, 2011 and an amendment to this submittal that was submitted on September 19, 2011.

V. Statutory and Executive Order Reviews

Under the CAA, the Administrator is required to approve a SIP submission that complies with the provisions of the Act and applicable federal regulations 42 U.S.C. 7410(k); 40 CFR 52.02(a). Thus, in reviewing SIP submissions, EPA's role is to approve state choices, provided that they meet the criteria of the CAA. Accordingly, this action merely approves state law as meeting federal requirements, and it does not impose additional requirements beyond those imposed by state law. For that reason, this action:

- is not a "significant regulatory action" subject to review by the Office of Management and Budget under Executive Order 12866 (58 FR 51735, October 4, 1993);
- does not impose an information collection burden under the provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*);
- is certified as not having a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*);
- does not contain any unfunded mandate or significantly or uniquely affect small governments, as described in the Unfunded Mandates Reform Act of 1995 (Public Law 104-4);
- does not have federalism implications as specified in Executive Order 13132 (64 FR 43255, August 10, 1999);

- is not an economically significant regulatory action based on health or safety risks subject to Executive Order 13045 (62 FR 19885, April 23, 1997);
- is not a significant regulatory action subject to Executive Order 13211 (66 FR 28355, May 22, 2001);
- is not subject to requirements of Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) because application of those requirements would be inconsistent with the CAA; and
- does not provide EPA with the discretionary authority to address, as appropriate, disproportionate human health or environmental effects, using practicable and legally permissible methods, under Executive Order 12898 (59 FR 7629, February 16, 1994).

In addition, this rule does not have tribal implications as specified by Executive Order 13175 (65 FR 67249, November 9, 2000), because the SIP is not approved to apply in Indian country located in the state, and EPA notes that it will not impose substantial direct costs on tribal governments or preempt tribal law.

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Intergovernmental relations, Nitrogen dioxides, Particulate matter, Reporting and recordkeeping requirements, Sulfur dioxide, Volatile organic compounds.

AUTHORITY: 42 U.S.C. 7401 *et seq.*

Dated: November 29, 2011

Howard M. Cantor,

Acting Regional Administrator, EPA, Region 8.

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