

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA-R08-OAR-2023-0489; FRL-12135-01-R8]

Air Plan Partial Approval and Partial Disapproval; Wyoming; Regional Haze Plan for the Second Implementation Period

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing to partially approve and partially disapprove the regional haze state implementation plan (SIP) submission submitted by the State of Wyoming on August 10, 2022 (Wyoming's 2022 SIP submission) under the Clean Air Act (CAA) and the EPA's Regional Haze Rule (RHR) for the program's second implementation period. Wyoming's 2022 SIP submission addresses the requirement that states revise their long-term strategies every implementation period to make reasonable progress towards the national goal of preventing any future, and remedying any existing, anthropogenic impairment of visibility, including regional haze, in mandatory Class I Federal areas. Wyoming's 2022 SIP submission also addresses other applicable requirements for the second implementation period of the regional haze program. The EPA is taking this action pursuant to the CAA.

DATES: Written comments must be received on or before September 3, 2024.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA-R08-OAR-2023-0489, to the Federal Rulemaking Portal: <https://www.regulations.gov>. Follow the online instructions for submitting comments. Once submitted, comments cannot be edited or removed from <https://www.regulations.gov>. The EPA may publish any comment received to its public docket. Do not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (*i.e.*, on the web,

cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit <https://www2.epa.gov/dockets/commenting-epa-dockets>.

Docket: All documents in the docket are listed in the <https://www.regulations.gov> index. Although listed in the index, some information is not publicly available, *e.g.*, CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available electronically in <https://www.regulations.gov>. Please email or call the person listed in the **FOR FURTHER INFORMATION CONTACT** section if you need to make alternative arrangements for access to the docket.

FOR FURTHER INFORMATION CONTACT: Jaslyn Dobrahner, Air and Radiation Division, EPA, Region 8, Mailcode 8ARD-IO, 1595 Wynkoop Street, Denver, Colorado, 80202-1129, telephone number: (303) 312-6252; email address: dobrahner.jaslyn@epa.gov.

SUPPLEMENTARY INFORMATION: Throughout this document wherever "we," "us," or "our" is used, we mean the EPA.

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I. What action is the EPA proposing?

The EPA is proposing to partially approve and partially disapprove a SIP submission submitted by the State of Wyoming to the EPA on August 10,

2022, addressing the requirements of the second implementation period of the RHR. Specifically, the EPA is proposing approval for the portions of Wyoming's 2022 SIP submission relating to 40 CFR 51.308(f)(1): calculations of baseline, current, and natural visibility conditions, progress to date, and the uniform rate of progress; 40 CFR 51.308(f)(4): reasonably attributable visibility impairment; 40 CFR 51.308(f)(5) and 40 CFR 51.308(g): progress report requirements; and 40 CFR 51.308(f)(6): monitoring strategy and other implementation plan requirements. For the reasons described in this document, the EPA is proposing disapproval for the remainder of Wyoming's 2022 SIP submission, which addresses 40 CFR 51.308(f)(2): long-term strategy; 40 CFR 51.308(f)(3): reasonable progress goals; and 40 CFR 51.308(i): FLM consultation. Consistent with section 110(k)(3) of the CAA, the EPA may partially approve portions of a submittal if those elements meet all applicable requirements and may disapprove the remainder so long as the elements are fully separable.¹

II. Background and Requirements for Regional Haze Plans

A. Regional Haze

In the 1977 CAA amendments, Congress created a program for protecting visibility in the nation's mandatory Class I Federal areas, which include certain national parks and wilderness areas.² CAA section 169A. The CAA 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 which impairment results from manmade air pollution." CAA section 169A(a)(1). The CAA further directs the EPA to promulgate regulations to assure reasonable progress toward meeting this national goal. CAA section 169A(a)(4). On December 2, 1980, the EPA promulgated regulations to address visibility impairment in mandatory Class I Federal areas (hereinafter referred to as "Class I areas") that is "reasonably attributable" to a single source or small

¹ See CAA section 110(k)(3) and July 1992 EPA memorandum titled "Processing of State Implementation Plan (SIP) Submittals" from John Calcagni, at <https://www.epa.gov/sites/default/files/2015-07/documents/procsip.pdf>.

² Areas statutorily designated as mandatory Class I Federal areas consist of national parks exceeding 6,000 acres, wilderness areas and national memorial parks exceeding 5,000 acres, and all international parks that were in existence on August 7, 1977. CAA section 162(a). There are 156 mandatory Class I areas. The list of areas to which the requirements of the visibility protection program apply is in 40 CFR part 81, subpart D.

group of sources. (45 FR 80084, December 2, 1980). These regulations, codified at 40 CFR 51.300 through 51.307, represented the first phase of the EPA's efforts to address visibility impairment. In 1990, Congress added section 169B to the CAA to further address visibility impairment, specifically, impairment from regional haze. CAA section 169B. The EPA promulgated the Regional Haze Rule (RHR), codified at 40 CFR 51.308 and 51.309,³ on July 1, 1999. (64 FR 35714, July 1, 1999). On January 10, 2017, the EPA promulgated additional regulations that address visibility impairment for the second and subsequent implementation periods (82 FR 3078, January 10, 2017). These regional haze regulations are a central component of the EPA's comprehensive visibility protection program for Class I areas.

Regional haze is visibility impairment that is produced by a multitude of anthropogenic sources and activities that are located across a broad geographic area and that emit pollutants that impair visibility. Visibility impairing pollutants include fine and coarse particulate matter (PM) (e.g., sulfates, nitrates, organic carbon, elemental carbon, and soil dust) and their precursors (e.g., sulfur dioxide (SO₂), nitrogen oxides (NO_x), and, in some cases, volatile organic compounds (VOC) and ammonia (NH₃)). Fine particle precursors react in the atmosphere to form fine particulate matter (PM_{2.5}), which impairs visibility by scattering and absorbing light. Visibility impairment reduces the perception of clarity and color, as well as visible distance.⁴

³ In addition to the generally applicable regional haze provisions at 40 CFR 51.308, the EPA also promulgated regulations specific to addressing regional haze visibility impairment in Class I areas on the Colorado Plateau at 40 CFR 51.309. The requirements under 40 CFR 51.309(d)(4) contain general requirements pertaining to stationary sources and market trading and allow states to adopt alternatives to the point source application of BART.

⁴ There are several ways to measure the amount of visibility impairment, i.e., haze. One such measurement is the deciview, which is the principal metric used by the RHR. Under many circumstances, a change in one deciview will be perceived by the human eye to be the same on both clear and hazy days. The deciview is unitless. It is proportional to the logarithm of the atmospheric extinction of light, which is the perceived dimming of light due to its being scattered and absorbed as it passes through the atmosphere. Atmospheric light extinction (b^{ext}) is a metric used for expressing visibility and is measured in inverse megameters (Mm⁻¹). The EPA's Guidance on Regional Haze State Implementation Plans for the Second Implementation Period ("2019 Guidance") offers the flexibility for the use of light extinction in certain cases. Light extinction can be simpler to use in calculations than deciviews, since it is not a logarithmic function. See, e.g., 2019 Guidance at 16,

To address regional haze visibility impairment, the 1999 RHR established an iterative planning process that requires both states in which Class I areas are located and states "the emissions from which may reasonably be anticipated to cause or contribute to any impairment of visibility" in a Class I area to periodically submit SIP revisions to address such impairment. CAA section 169A(b)(2);⁵ see also 40 CFR 51.308(b), (f) (establishing submission dates for iterative regional haze SIP revisions); (64 FR at 35768, July 1, 1999). Under the CAA, each SIP submission must contain "a long-term (ten to fifteen years) strategy for making reasonable progress toward meeting the national goal," CAA section 169A(b)(2)(B); the initial round of SIP submissions also had to address the statutory requirement that certain older, larger sources of visibility impairing pollutants install and operate the best available retrofit technology (BART). CAA section 169A(b)(2)(A); 40 CFR 51.308(d) and (e). States' first regional haze SIPs were due by December 17, 2007, 40 CFR 51.308(b), with subsequent SIP submissions containing updated long-term strategies originally due July 31, 2018, and every ten years thereafter. (64 FR at 35768, July 1, 1999). The EPA established in the 1999 RHR that all states either have Class I areas within their borders or "contain sources whose emissions are reasonably anticipated to contribute to regional haze in a Class I area"; therefore, all states must submit regional haze SIPs.⁶ Id. at 35721.

Much of the focus in the first implementation period of the regional haze program, which ran from 2007 through 2018, was on satisfying states' BART obligations. First implementation period SIPs were additionally required to contain long-term strategies for making reasonable progress toward the national visibility goal, of which BART is one component. The core required

19, <https://www.epa.gov/visibility/guidance-regional-haze-state-implementation-plans-second-implementation-period>. The EPA Office of Air Quality Planning and Standards, Research Triangle Park (August 20, 2019). The formula for the deciview is $10 \ln(\text{bext})/10 \text{ Mm}^{-1}$. 40 CFR 51.301.

⁵ The RHR expresses the statutory requirement for states to submit plans addressing out-of-state Class I areas by providing that states must address visibility impairment "in each mandatory Class I Federal area located outside the State that may be affected by emissions from within the State." 40 CFR 51.308(d), (f).

⁶ In addition to each of the fifty states, the EPA also concluded that the Virgin Islands and District of Columbia must also submit regional haze SIPs because they either contain a Class I area or contain sources whose emissions are reasonably anticipated to contribute regional haze in a Class I area. See 40 CFR 51.300(b), (d)(3).

elements for the first implementation period SIPs (other than BART) are laid out in 40 CFR 51.308(d). Those provisions required that states containing Class I areas establish reasonable progress goals (RPGs) that are measured in deciviews and reflect the anticipated visibility conditions at the end of the implementation period including from implementation of states' long-term strategies. The first planning period⁷ RPGs were required to provide for an improvement in visibility for the most impaired days over the period of the implementation plan and ensure no degradation in visibility for the least impaired days over the same period. In establishing the RPGs for any Class I area in a state, the state was required to consider four statutory factors: the costs of compliance, the time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any potentially affected sources. CAA section 169A(g)(1); 40 CFR 51.308(d)(1).

States were also required to calculate baseline (using the five-year period of 2000–2004) and natural visibility conditions (*i.e.*, visibility conditions without anthropogenic visibility impairment) for each Class I area, and to calculate the linear rate of progress needed to attain natural visibility conditions, assuming a starting point of baseline visibility conditions in 2004 and ending with natural conditions in 2064. This linear interpolation is known as the uniform rate of progress (URP) and is used as a tracking metric to help states assess the amount of progress they are making towards the national visibility goal over time in each Class I area.⁸ 40 CFR 51.308(d)(1)(i)(B), (d)(2). The 1999 RHR also provided that states' long-term strategies must include the "enforceable emissions limitations,

⁷ The EPA uses the terms "implementation period" and "planning period" interchangeably.

⁸ The EPA established the URP framework in the 1999 RHR to provide "an equitable analytical approach" to assessing the rate of visibility improvement at Class I areas across the country. The starting point for the URP analysis is 2004 and the endpoint was calculated based on the amount of visibility improvement that was anticipated to result from implementation of existing CAA programs over the period from the mid-1990s to approximately 2005. Assuming this rate of progress would continue into the future, the EPA determined that natural visibility conditions would be reached in 60 years, or 2064 (60 years from the baseline starting point of 2004). However, the EPA did not establish 2064 as the year by which the national goal *must* be reached. 64 FR at 35731–32. That is, the URP and the 2064 date are not enforceable targets but are rather tools that "allow for analytical comparisons between the rate of progress that would be achieved by the state's chosen set of control measures and the URP." (82 FR 3078, 3084, January 10, 2017).

compliance schedules, and other measures as necessary to achieve the reasonable progress goals." 40 CFR 51.308(d)(3). In establishing their long-term strategies, states are required to consult with other states that also contribute to visibility impairment in a given Class I area and include all measures necessary to obtain their shares of the emission reductions needed to meet the RPGs. 40 CFR 51.308(d)(3)(i), (ii). Section 51.308(d) also contains seven additional factors states must consider in formulating their long-term strategies, 40 CFR 51.308(d)(3)(v), as well as provisions governing monitoring and other implementation plan requirements. 40 CFR 51.308(d)(4). Finally, the 1999 RHR required states to submit periodic progress reports—SIP revisions due every five years that contain information on states' implementation of their regional haze plans and an assessment of whether anything additional is needed to make reasonable progress, see 40 CFR 51.308(g), (h)—and to consult with the Federal Land Manager(s)⁹ (FLMs) responsible for each Class I area according to the requirements in CAA section 169A(d) and 40 CFR 51.308(i).

On January 10, 2017, the EPA promulgated revisions to the RHR, (82 FR 3078, January 10, 2017), that apply for the second and subsequent implementation periods. The 2017 rulemaking made several changes to the requirements for regional haze SIPs to clarify states' obligations and streamline certain regional haze requirements. The revisions to the regional haze program for the second and subsequent implementation periods focused on the requirement that states' SIPs contain long-term strategies for making reasonable progress towards the national visibility goal. The reasonable progress requirements as revised in the 2017 rulemaking (referred to here as the 2017 RHR Revisions) are codified at 40 CFR 51.308(f). Among other changes, the 2017 RHR Revisions adjusted the deadline for states to submit their second implementation period SIPs from July 31, 2018, to July 31, 2021, clarified the order of analysis and the relationship between RPGs and the long-term strategy, and focused on making visibility improvements on the days with the most *anthropogenic* visibility impairment, as opposed to the days with the most visibility

⁹ The EPA's regulations define "Federal Land Manager" as "the Secretary of the department with authority over the Federal Class I area (or the Secretary's designee) or, with respect to Roosevelt-Campobello International Park, the Chairman of the Roosevelt-Campobello International Park Commission." 40 CFR 51.301.

impairment overall. The EPA also revised requirements of the visibility protection program related to periodic progress reports and FLM consultation. The specific requirements applicable to second implementation period regional haze SIP submissions are addressed in detail below.

The EPA provided guidance to the states for their second implementation period SIP submissions in the preamble to the 2017 RHR Revisions as well as in subsequent, stand-alone guidance documents. In August 2019, the EPA issued "Guidance on Regional Haze State Implementation Plans for the Second Implementation Period" ("2019 Guidance").¹⁰ On July 8, 2021, the EPA issued a memorandum containing "Clarifications Regarding Regional Haze State Implementation Plans for the Second Implementation Period" ("2021 Clarifications Memo").¹¹ Additionally, the EPA further clarified the recommended procedures for processing ambient visibility data and optionally adjusting the URP to account for international anthropogenic and prescribed fire impacts in two technical guidance documents: the December 2018 "Technical Guidance on Tracking Visibility Progress for the Second Implementation Period of the Regional Haze Program" ("2018 Visibility Tracking Guidance"),¹² and the June 2020 "Recommendation for the Use of Patched and Substituted Data and Clarification of Data Completeness for Tracking Visibility Progress for the Second Implementation Period of the Regional Haze Program" and associated Technical Addendum ("2020 Data Completeness Memo").¹³

¹⁰ Guidance on Regional Haze State Implementation Plans for the Second Implementation Period. <https://www.epa.gov/visibility/guidance-regional-haze-state-implementation-plans-second-implementation-period>. The EPA Office of Air Quality Planning and Standards, Research Triangle Park (August 20, 2019).

¹¹ Clarifications Regarding Regional Haze State Implementation Plans for the Second Implementation Period. <https://www.epa.gov/system/files/documents/2021-07/clarifications-regarding-regional-haze-state-implementation-plans-for-the-second-implementation-period.pdf>. The EPA Office of Air Quality Planning and Standards, Research Triangle Park (July 8, 2021).

¹² Technical Guidance on Tracking Visibility Progress for the Second Implementation Period of the Regional Haze Program. <https://www.epa.gov/visibility/technical-guidance-tracking-visibility-progress-second-implementation-period-regional>. The EPA Office of Air Quality Planning and Standards, Research Triangle Park. (December 20, 2018).

¹³ Recommendation for the Use of Patched and Substituted Data and Clarification of Data Completeness for Tracking Visibility Progress for the Second Implementation Period of the Regional Haze Program. <https://www.epa.gov/visibility/memo-and-technical-addendum-ambient-data>

As explained in the 2021 Clarifications Memo, the EPA intends the second implementation period of the regional haze program to secure meaningful reductions in visibility impairing pollutants that build on the significant progress states have achieved to date. The Agency also recognizes that analyses regarding reasonable progress are state-specific and that, based on states' and sources' individual circumstances, what constitutes reasonable reductions in visibility impairing pollutants will vary from state-to-state. While there exist many opportunities for states to leverage both ongoing and upcoming emission reductions under other CAA programs, the Agency expects states to undertake rigorous reasonable progress analyses that identify further opportunities to advance the national visibility goal consistent with the statutory and regulatory requirements. See generally 2021 Clarifications Memo. This is consistent with Congress's determination that a visibility protection program is needed in addition to the CAA's National Ambient Air Quality Standards and Prevention of Significant Deterioration programs, as further emission reductions may be necessary to adequately protect visibility in Class I areas throughout the country.¹⁴

B. Roles of Agencies in Addressing Regional Haze

Because the air pollutants and pollution affecting visibility in Class I areas can be transported over long distances, successful implementation of the regional haze program requires long-term, regional coordination among multiple jurisdictions and agencies that have responsibility for Class I areas and the emissions that impact visibility in those areas. To address regional haze, states need to develop strategies in coordination with one another, considering the effect of emissions from one jurisdiction on the air quality in another. Five regional planning organizations (RPOs),¹⁵ which include representation from state and Tribal

usage-and-completeness-regional-haze-program. The EPA Office of Air Quality Planning and Standards, Research Triangle Park (June 3, 2020).

¹⁴ See, e.g., H.R. Rep. No. 95–294 at 205 (“In determining how to best remedy the growing visibility problem in these areas of great scenic importance, the committee realizes that as a matter of equity, the national ambient air quality standards cannot be revised to adequately protect visibility in all areas of the country.”), (“the mandatory Class I increments of [the PSD program] do not adequately protect visibility in Class I areas”).

¹⁵ RPOs are sometimes also referred to as “multi-jurisdictional organizations,” or MJOs. For the purposes of this document, the terms RPO and MJO are synonymous.

governments, the EPA, and FLMs, were developed in the lead-up to the first implementation period to address regional haze. RPOs evaluate technical information to better understand how emissions from state and tribal land impact Class I areas across the country, pursue the development of regional strategies to reduce emissions of particulate matter and other pollutants leading to regional haze, and help states meet the consultation requirements of the RHR.

The Western Regional Air Partnership (WRAP), one of the five regional planning organizations described in the previous paragraph, is a collaborative effort of state governments, local air agencies, tribal governments, and various federal agencies established to initiate and coordinate activities associated with the management of regional haze, visibility, and other air quality issues in the Western United States. Members include the states of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming, and 28 tribal governments.¹⁶ The federal partner members of WRAP are the EPA, U.S. National Parks Service (NPS), U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS), and the Bureau of Land Management (BLM).

The WRAP membership formed a workgroup to develop a planning framework for state regional haze second planning period SIPs. Based on emissions and monitoring data supplied by its membership, WRAP produced a technical system to support regional modeling of visibility impacts at Class I areas across the West. The WRAP Technical Support System consolidated air quality monitoring data, meteorological and receptor modeling data analyses, emissions inventories and projections, and gridded air quality/visibility regional modeling results. The Technical Support System is accessible by member states and allows for the creation of maps, figures, and tables to export and use in state plan development. It also maintains the original source data for verification and further analysis.

C. Status of Wyoming's Regional Haze Plan for the First Implementation Period

The CAA requires that regional haze plans for the first implementation period (2008 through 2018) include, among other things, a long-term strategy for making reasonable progress and BART requirements for certain older

stationary sources, where applicable.¹⁷ In 2011 and 2012, Wyoming submitted first implementation period regional haze SIP submissions addressing the requirements of 40 CFR 51.309, which superseded its regional haze SIP submissions from 2003, 2004, and 2008.¹⁸ On December 12, 2012, the EPA approved the 2011 and 2012 SIP submissions as meeting the requirements of the CAA and the RHR, with the exception of 40 CFR 51.309(d)(4)(vii) and 40 CFR 51.309(g).¹⁹ The EPA then issued a final rule in 2014 (2014 final rule) partially approving and partially disapproving the 2011 SIP submission under 40 CFR 51.309(g) and promulgating a FIP for the disapproved portions (together referred to as the regional haze implementation plan).²⁰

Several parties filed petitions for review of the 2014 final rule in the U.S. Court of Appeals for the Tenth Circuit, challenging the portions of the rule related to NO_x BART determinations for several facilities.²¹ The parties settled the challenges regarding Laramie River Station Units 1–3²² and Dave Johnston Unit 3. The Court ruled on the remaining issues in 2023. It upheld the EPA's approval of Wyoming's NO_x BART determination for Naughton Units 1 and 2 and vacated and remanded the EPA's disapproval of Wyoming's NO_x

¹⁷ Requirements for regional haze SIPs for the first implementation period are also contained in CAA section 169A(b)(2). The 1999 Regional Haze Rule provided two paths for states to address regional haze in the first implementation period. Most states must follow 40 CFR 51.308(d) and (e), which require states to perform individual point source BART determinations and evaluate the need for other control strategies. Additionally, the requirements for addressing regional haze visibility impairment in the sixteen Class I areas covered by the Grand Canyon Visibility Transport Commission are found in 40 CFR 51.309(d)(4), which contains general requirements pertaining to stationary sources and market trading and allows states to adopt alternatives to the point source application of BART. See also 40 CFR 51.308(b). States with Class I areas covered by the Grand Canyon Visibility Transport Commission could choose to submit a regional haze SIP under 40 CFR 51.308 or 40 CFR 51.309.

¹⁸ These SIP submissions were submitted on January 12, 2011; April 19, 2012; December 24, 2003; May 27, 2004; and November 21, 2008.

¹⁹ 77 FR 73926 (December 12, 2012).

²⁰ 79 FR 5032 (January 30, 2014).

²¹ *Basin Electric Cooperative v. EPA*, No. 14–9533 (10th Cir.); *Wyoming v. EPA*, No. 14–9529 (10th Cir.); *PacificCorp v. EPA*, No. 14–9534 (10th Cir.); *Powder River Basin Resource Council, et al. v. EPA*, No. 14–9530 (10th Cir.).

²² Following that settlement, on May 20, 2019, the EPA approved SIP revisions and revised the FIP to: (1) modify the SO₂ emissions reporting requirements for Laramie River Station Units 1 and 2; (2) revise the NO_x emission limits for Laramie River Station Units 1, 2 and 3; and (3) establish an SO₂ emission limit averaged annually across Laramie River Station Units 1 and 2. 84 FR 22711 (May 20, 2019).

¹⁶ A full list of WRAP members is available at <https://www.westar.org/wrap-council-members/>.

BART determination (and the EPA's subsequent promulgation of a FIP emission limit) for Wyodak power plant.²³

On November 28, 2017, Wyoming submitted its first progress report SIP submission. It detailed progress made toward achieving reasonable progress for visibility improvement and included a determination of adequacy of the State's regional haze implementation plan to meet reasonable progress goals. In 2020, we approved Wyoming's progress report SIP submission.²⁴

In addition, in 2019, we approved an additional first implementation period SIP submission regarding BART requirements for Naughton Unit 3.²⁵ On April 10, 2024, we proposed to approve additional revisions for Jim Bridger Power Plant that Wyoming submitted for the first implementation period regional haze SIP.²⁶

D. Wyoming's Regional Haze Plan for the Second Implementation Period

On August 10, 2022, Wyoming submitted a SIP submission to address its regional haze obligations for the second implementation period (2018–2028). Wyoming's 2022 SIP submission contains the State's long-term strategy to address regional haze visibility impairment for each Class I area within the State and each Class I area outside the State that may be affected by emissions from the State. In developing its long-term strategy, the State examined the need to implement additional enforceable emission limitations, compliance schedules, and other measures that are necessary to make reasonable progress since the first implementation period. Specifically, Wyoming's 2022 SIP submission contains an assessment of visibility progress made at Class I areas since the first implementation period and a long-term strategy to address regional haze visibility impairment at the 23 Class I areas the State identified, including: Wyoming's selection of sources that may affect visibility in Class I areas within the State and outside the State for four-factor analysis; its evaluation of the selected sources to determine what emission reduction measures constitute reasonable progress for the long-term strategy; regional scale modeling of the State's long-term strategy to set reasonable progress goals for 2028; and ultimately, Wyoming's determinations

on what control measures are necessary for the long-term strategy to address regional haze visibility impairment in the 23 Class I areas. The State concluded that no additional emission reduction measures for any Wyoming facilities are required for the second implementation period under its long-term strategy.

III. Requirements for Regional Haze Plans for the Second Implementation Period

Under the CAA and the EPA's regulations, all 50 states, the District of Columbia, and the U.S. Virgin Islands are required to submit regional haze SIPs satisfying the applicable requirements for the second implementation period of the regional haze program by July 31, 2021.²⁷ Each state's SIP must contain a long-term strategy for making reasonable progress toward meeting the national goal of remedying any existing and preventing any future anthropogenic visibility impairment in Class I areas. CAA section 169A(b)(2)(B). To this end, § 51.308(f) lays out the process by which states determine what constitutes their long-term strategies, with the order of the requirements in § 51.308(f)(1) through (3) generally mirroring the order of the steps in the reasonable progress analysis²⁸ and (f)(4) through (6) containing additional, related requirements. Broadly speaking, a state first must identify the Class I areas within the state and determine the Class I areas outside the state in which visibility may be affected by emissions from the state. These are the Class I areas that must be addressed in the state's long-term strategy. See 40 CFR 51.308(f), (f)(2). For each Class I area within its borders, a state must then calculate the baseline, current, and natural visibility conditions for that

area, as well as the visibility improvement made to date and the URP. See 40 CFR 51.308(f)(1). Each state having a Class I area and/or emissions that may affect visibility in a Class I area must then develop a long-term strategy that includes the enforceable emission limitations, compliance schedules, and other measures that are necessary to make reasonable progress in such areas. A reasonable progress determination is based on applying the four factors in CAA section 169A(g)(1) to sources of visibility impairing pollutants that the state has selected to assess for controls for the second implementation period. Additionally, as further explained below, the RHR at 40 CFR 51.3108(f)(2)(iv) separately provides five "additional factors"²⁹ that states must consider in developing their long-term strategies. See 40 CFR 51.308(f)(2). A state evaluates potential emission reduction measures for those selected sources and determines which are necessary to make reasonable progress. Those measures are then incorporated into the state's long-term strategy. After a state has developed its long-term strategy, it then establishes RPGs for each Class I area within its borders by modeling the visibility impacts of all reasonable progress controls at the end of the second implementation period, *i.e.*, in 2028, as well as the impacts of other requirements of the CAA. The RPGs include reasonable progress controls not only for sources in the state in which the Class I area is located, but also for sources in other states that contribute to visibility impairment in that area. The RPGs are then compared to the baseline visibility conditions and the URP to ensure that progress is being made towards the statutory goal of preventing any future and remedying any existing anthropogenic visibility impairment in Class I areas. 40 CFR 51.308(f)(2)–(3).

In addition to satisfying the requirements at 40 CFR 51.308(f) related to reasonable progress, the regional haze SIP revisions for the second implementation period must address the requirements in § 51.308(g)(1) through (5) pertaining to periodic reports describing progress towards the RPGs, 40 CFR 51.308(f)(5), as well as requirements for FLM consultation that apply to all visibility protection SIPs and SIP revisions. 40 CFR 51.308(i).

A state must submit its regional haze SIP and subsequent SIP revisions to the EPA according to the requirements

²³ *Wyoming v. EPA*, 78 F.4th 1171, 1175, 1181, 1183 (10th Cir. 2023).

²⁴ 85 FR 21341 (April 17, 2020) (proposed rule); 85 FR 38325 (June 26, 2020) (final rule).

²⁵ 84 FR 10433 (March 21, 2019).

²⁶ 89 FR 25200 (April 10, 2024). The EPA has not yet issued a final rule.

²⁷ Wyoming is one of a few states with outstanding first planning period obligations. The EPA is not precluded from acting on a second planning period SIP submission on the basis that a state has outstanding first planning period obligations. All states have an obligation to submit second planning period SIP submissions by July 31, 2021, regardless of the status of first planning period obligations. After a second planning period SIP submission is submitted to the EPA for review, the EPA is statutorily required to review and act on that submission within 12 months of it being deemed complete. See CAA section 110(k)(1)(B), 42 U.S.C. 7410(k)(1)(B). Throughout actions on the second planning period, the EPA will continue to work with those states who have outstanding first planning period obligations to ensure there is no gap that could affect the continuous progress of visibility improvement.

²⁸ The EPA explained in the 2017 RHR Revisions that we were adopting new regulatory language in 40 CFR 51.308(f) that, unlike the structure in 51.308(d), "tracked the actual planning sequence." (82 FR at 3091).

²⁹ The five "additional factors" for consideration in § 51.308(f)(2)(iv) are distinct from the four factors listed in CAA section 169A(g)(1) and 40 CFR 51.308(f)(2)(i) that states must consider and apply to sources in determining reasonable progress.

applicable to all SIP revisions under the CAA and the EPA's regulations. See CAA section 169A(b)(2); CAA section 110(a). Upon approval by the EPA, a SIP is enforceable by the Agency and the public under the CAA. If the EPA finds that a state fails to make a required SIP revision, or if the EPA finds that a state's SIP is incomplete or if it disapproves the SIP, the Agency must promulgate a federal implementation plan (FIP) that satisfies the applicable requirements. CAA section 110(c)(1).

A. Identification of Class I Areas

The first step in developing a regional haze SIP is for a state to determine which Class I areas, in addition to those within its borders, "may be affected" by emissions from within the state. In the 1999 RHR, the EPA determined that all states contribute to visibility impairment in at least one Class I area, 64 FR at 35720–22, and explained that the statute and regulations lay out an "extremely low triggering threshold" for determining "whether States should be required to engage in air quality planning and analysis as a prerequisite to determining the need for control of emissions from sources within their State." *Id.* at 35721.

A state must determine which Class I areas must be addressed by its SIP by evaluating the total emissions of visibility impairing pollutants from all sources within the state. While the RHR does not require this evaluation to be conducted in any particular manner, EPA's 2019 Guidance provides recommendations for how such an assessment might be accomplished, including by, where appropriate, using the determinations previously made for the first implementation period. 2019 Guidance at 8–9. In addition, the determination of which Class I areas may be affected by a state's emissions is subject to the requirement in 40 CFR 51.308(f)(2)(iii) to "document the technical basis, including modeling, monitoring, cost, engineering, and emissions information, on which the State is relying to determine the emission reduction measures that are necessary to make reasonable progress in each mandatory Class I Federal area it affects."

B. Calculation of Baseline, Current, and Natural Visibility Conditions; Progress to Date; and Uniform Rate of Progress

As part of assessing whether a SIP submission for the second implementation period is providing for reasonable progress towards the national visibility goal, the RHR contains requirements in § 51.308(f)(1) related to tracking visibility

improvement over time. The requirements of this section apply only to states having Class I areas within their borders; the required calculations must be made for each such Class I area. The EPA's 2018 Visibility Tracking Guidance³⁰ provides recommendations to assist states in satisfying their obligations under § 51.308(f)(1); specifically, in developing information on baseline, current, and natural visibility conditions, and in making optional adjustments to the URP to account for the impacts of international anthropogenic emissions and prescribed fires. See 82 FR at 3103–05.

The RHR requires tracking of visibility conditions on two sets of days: the clearest and the most impaired days. Visibility conditions for both sets of days are expressed as the average deciview index for the relevant five-year period (the period representing baseline or current visibility conditions). The RHR provides that the relevant sets of days for visibility tracking purposes are the 20% clearest (the 20% of monitored days in a calendar year with the lowest values of the deciview index) and 20% most impaired days (the 20% of monitored days in a calendar year with the highest amounts of anthropogenic visibility impairment).³¹ 40 CFR 51.301. A state must calculate visibility conditions for both the 20% clearest and 20% most impaired days for the baseline period of 2000–2004 and the most recent five-year period for which visibility monitoring data are available (representing current visibility conditions). 40 CFR 51.308(f)(1)(i), (iii). States must also calculate natural visibility conditions for the clearest and most impaired days,³² by estimating the conditions that would exist on those two sets of days absent anthropogenic visibility impairment. 40 CFR 51.308(f)(1)(ii). Using all these data,

³⁰ The 2018 Visibility Tracking Guidance references and relies on parts of the 2003 Tracking Guidance: "Guidance for Tracking Progress Under the Regional Haze Rule," which can be found at <https://www.epa.gov/sites/default/files/2021-03/documents/tracking.pdf>.

³¹ This document also refers to the 20% clearest and 20% most anthropogenically impaired days as the "clearest" and "most impaired" or "most anthropogenically impaired" days, respectively.

³² The RHR at 40 CFR 51.308(f)(1)(ii) contains an error related to the requirement for calculating two sets of natural conditions values. The rule says "most impaired days or the clearest days" where it should say "most impaired days and clearest days." This is an error that was intended to be corrected in the 2017 RHR Revisions but did not get corrected in the final rule language. This is supported by the preamble text at 82 FR at 3098: "In the final version of 40 CFR 51.308(f)(1)(ii), an occurrence of 'or' has been corrected to 'and' to indicate that natural visibility conditions for both the most impaired days and the clearest days must be based on available monitoring information."

states must then calculate, for each Class I area, the amount of progress made since the baseline period (2000–2004) and how much improvement is left to achieve to reach natural visibility conditions.

Using the data for the set of most impaired days only, states must plot a line between visibility conditions in the baseline period and natural visibility conditions for each Class I area to determine the URP—the amount of visibility improvement, measured in deciviews, that would need to be achieved during each implementation period to achieve natural visibility conditions by the end of 2064. The URP is used in later steps of the reasonable progress analysis for informational purposes and to provide a non-enforceable benchmark against which to assess a Class I area's rate of visibility improvement.³³ Additionally, in the 2017 RHR Revisions, the EPA provided states the option of proposing to adjust the endpoint of the URP to account for impacts of anthropogenic sources outside the United States and/or impacts of certain types of wildland prescribed fires. These adjustments, which must be approved by the EPA, are intended to avoid any perception that states should compensate for impacts from international anthropogenic sources and to give states the flexibility to determine that limiting the use of wildland-prescribed fire is not necessary for reasonable progress. 82 FR at 3107 footnote 116.

The EPA's 2018 Visibility Tracking Guidance can be used to help satisfy the 40 CFR 51.308(f)(1) requirements, including in developing information on baseline, current, and natural visibility conditions, and in making optional adjustments to the URP. In addition, the 2020 Data Completeness Memo provides recommendations on the data completeness language referenced in § 51.308(f)(1)(i) and provides updated natural conditions estimates for each Class I area.

C. Long-Term Strategy for Regional Haze

The core component of a regional haze SIP submission is a long-term strategy that addresses regional haze in each Class I area within a state's borders and each Class I area outside the state that may be affected by emissions from the state. The long-term strategy "must include the enforceable emissions

³³ Being on or below the URP is not a "safe harbor"; *i.e.*, achieving the URP does not mean that a Class I area is making "reasonable progress" and does not relieve a state from using the four statutory factors to determine what level of control is needed to achieve such progress. See, *e.g.*, 82 FR at 3093.

limitations, compliance schedules, and other measures that are necessary to make reasonable progress, as determined pursuant to (f)(2)(i) through (iv).” 40 CFR 51.308(f)(2). The amount of progress that is “reasonable progress” is based on applying the four statutory factors in CAA section 169A(g)(1) in an evaluation of potential control options for sources of visibility impairing pollutants, which is referred to as a “four-factor” analysis.³⁴ The outcome of that analysis is the emission reduction measures that a particular source or group of sources needs to implement to make reasonable progress towards the national visibility goal. See 40 CFR 51.308(f)(2)(i). Emission reduction measures that are necessary to make reasonable progress may be either new, additional control measures for a source, or they may be the existing emission reduction measures that a source is already implementing. See 2019 Guidance at 43; 2021 Clarifications Memo at 8–10. Such measures must be represented by “enforceable emissions limitations, compliance schedules, and other measures” (*i.e.*, any additional compliance tools) in a state’s long-term strategy in its SIP. 40 CFR 51.308(f)(2).

Section 51.308(f)(2)(i) provides the requirements for the four-factor analysis. The first step of this analysis entails selecting the sources to be evaluated for emission reduction measures; to this end, the RHR requires states to consider “major and minor stationary sources or groups of sources, mobile sources, and area sources” of visibility impairing pollutants for potential four-factor control analysis. 40 CFR 51.308(f)(2)(i). A threshold question at this step is which visibility impairing pollutants will be analyzed. As the EPA previously explained, consistent with the first implementation period, the EPA generally expects that each state will analyze at least SO₂ and NO_x in selecting sources and determining control measures. See 2019 Guidance at 12, 2021 Clarifications Memo at 4. A state that chooses not to consider at least these two pollutants should demonstrate why such consideration would be unreasonable. 2021 Clarifications Memo at 4.

While states have the option to analyze *all* sources, the 2019 Guidance explains that “an analysis of control measures is not required for every source in each implementation period,” and that “[s]electing a set of sources for analysis of control measures in each implementation period is . . .

consistent with the Regional Haze Rule, which sets up an iterative planning process and anticipates that a state may not need to analyze control measures for all its sources in a given SIP revision.” 2019 Guidance at 9. However, given that source selection is the basis of all subsequent control determinations, a reasonable source selection process “should be designed and conducted to ensure that source selection results in a set of pollutants and sources the evaluation of which has the potential to meaningfully reduce their contributions to visibility impairment.” 2021 Clarifications Memo at 3.

The EPA explained in the 2021 Clarifications Memo that each state has an obligation to submit a long-term strategy that addresses the regional haze visibility impairment that results from emissions from within that state. Thus, source selection should focus on the in-state contribution to visibility impairment and be designed to capture a meaningful portion of the state’s total contribution to visibility impairment in Class I areas. A state should not decline to select its largest in-state sources on the basis that there are even larger out-of-state contributors. 2021 Clarifications Memo at 4.³⁵

Thus, while states have discretion to choose any source selection methodology that is reasonable, whatever choices they make should be reasonably explained. To this end, 40 CFR 51.308(f)(2)(i) requires that a state’s SIP submission include “a description of the criteria it used to determine which sources or groups of sources it evaluated.” The technical basis for source selection, which may include methods for quantifying potential visibility impacts such as emissions divided by distance metrics, trajectory analyses, residence time analyses, and/or photochemical modeling, must also be appropriately documented, as required by 40 CFR 51.308(f)(2)(iii).

Once a state has selected the set of sources, the next step is to determine the emissions reduction measures for those sources that are necessary to make reasonable progress for the second implementation period.³⁶ This is

³⁵ Similarly, in responding to comments on the 2017 RHR Revisions the EPA explained that “[a] state should not fail to address its many relatively low-impact sources merely because it only has such sources and another state has even more low-impact sources and/or some high impact sources.” Responses to Comments on Protection of Visibility: Amendments to Requirements for State Plans; Proposed Rule (81 FR 26942, May 4, 2016) at 87–88.

³⁶ The CAA provides that, “[i]n determining reasonable progress there shall be taken into consideration” the four statutory factors. CAA section 169A(g)(1). However, in addition to four-

accomplished by considering the four factors—“the costs of compliance, the time necessary for compliance, and the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any existing source subject to such requirements.” CAA section 169A(g)(1). The EPA has explained that the four-factor analysis is an assessment of potential emission reduction measures (*i.e.*, control options) for sources; “use of the terms ‘compliance’ and ‘subject to such requirements’ in section 169A(g)(1) strongly indicates that Congress intended the relevant determination to be the requirements with which sources would have to comply to satisfy the CAA’s reasonable progress mandate.” 82 FR at 3091. Thus, for each source it has selected for four-factor analysis,³⁷ a state must consider a “meaningful set” of technically feasible control options for reducing emissions of visibility impairing pollutants. *Id.* at 3088. The 2019 Guidance provides that “[a] state must reasonably pick and justify the measures that it will consider, recognizing that there is no statutory or regulatory requirement to consider all technically feasible measures or any particular measures. A range of technically feasible measures available to reduce emissions would be one way to justify a reasonable set.” 2019 Guidance at 29.

The EPA’s 2021 Clarifications Memo provides further guidance on what constitutes a reasonable set of control options for consideration: “A reasonable four-factor analysis will consider the full range of potentially reasonable options for reducing emissions.” 2021 Clarifications Memo at 7. In addition to

factor analyses for selected sources, groups of sources, or source categories, a state may also consider additional emission reduction measures for inclusion in its long-term strategy, *e.g.*, from other newly adopted, on-the-books, or on-the-way rules and measures for sources not selected for four-factor analysis for the second implementation period.

³⁷ “Each source” or “particular source” is used here as shorthand. While a source-specific analysis is one way of applying the four factors, neither the statute nor the RHR requires states to evaluate individual sources. Rather, states have “the flexibility to conduct four-factor analyses for specific sources, groups of sources or even entire source categories, depending on state policy preferences and the specific circumstances of each state.” 82 FR at 3088. However, not all approaches to grouping sources for four-factor analysis are necessarily reasonable; the reasonableness of grouping sources in any particular instance will depend on the circumstances and the manner in which grouping is conducted. If it is feasible to establish and enforce different requirements for sources or subgroups of sources, and if relevant factors can be quantified for those sources or subgroups, then states should make a separate reasonable progress determination for each source or subgroup. 2021 Clarifications Memo at 7–8.

³⁴ Four-factor analysis considers the four statutory factors specified in CAA section 169A(g)(1) and 40 CFR 51.308(f)(2)(i).

add-on controls and other retrofits (*i.e.*, new emissions reduction measures for sources), the EPA explained that states should generally analyze efficiency improvements for sources' existing measures as control options in their four-factor analyses, as in many cases such improvements are reasonable given that they typically involve only additional operation and maintenance costs. Additionally, the 2021 Clarifications Memo provides that states that have assumed a higher emissions rate than a source has achieved or could potentially achieve using its existing measures should also consider lower emissions rates as potential control options. That is, a state should consider a source's recent actual and projected emission rates to determine if it could reasonably attain lower emission rates with its existing measures. If so, the state should analyze the lower emission rate as a control option for reducing emissions. 2021 Clarifications Memo at 7. The EPA's recommendations to analyze potential efficiency improvements and achievable lower emission rates apply to both sources that have been selected for four-factor analysis and those that have forgone a four-factor analysis on the basis of existing "effective controls." See 2021 Clarifications Memo at 5, 10.

After identifying a reasonable set of potential control options for the sources it has selected, a state then collects information on the four factors with regard to each option identified. The EPA has also explained that, in addition to the four statutory factors, states have flexibility under the CAA and RHR to reasonably consider visibility benefits as an additional factor alongside the four statutory factors.³⁸ The 2019 Guidance provides recommendations for the types of information that can be used to characterize the four factors (with or without visibility), as well as ways in which states might reasonably consider and balance that information to determine which of the potential control options is necessary to make reasonable progress. See 2019 Guidance at 30–36. The 2021 Clarifications Memo contains further guidance on how states can reasonably consider modeled visibility impacts or benefits in the context of a four-factor analysis. 2021 Clarifications Memo at 12–13, 14–15. Specifically, the EPA explained that while visibility can reasonably be used when comparing and choosing between multiple

reasonable control options, it should not be used to summarily reject controls that are reasonable given the four statutory factors. 2021 Clarifications Memo at 13. Ultimately, while states have discretion to reasonably weigh the factors and to determine what level of control is needed, § 51.308(f)(2)(i) provides that a state "must include in its implementation plan a description of . . . how the four factors were taken into consideration in selecting the measure for inclusion in its long-term strategy."

As explained above, § 51.308(f)(2)(i) requires states to determine the emission reduction measures for sources that are necessary to make reasonable progress by considering the four factors. Pursuant to § 51.308(f)(2), measures that are necessary to make reasonable progress towards the national visibility goal must be included in a state's long-term strategy and in its SIP.³⁹ If the outcome of a four-factor analysis is a new, additional emission reduction measure for a source, that new measure is necessary to make reasonable progress towards remedying existing anthropogenic visibility impairment and must be included in the SIP. If the outcome of a four-factor analysis is that no new measures are reasonable for a source, continued implementation of the source's existing measures is generally necessary to prevent future emission increases and thus to make reasonable progress towards the second part of the national visibility goal: preventing future anthropogenic visibility impairment. See CAA section 169A(a)(1). That is, when the result of a four-factor analysis is that no new measures are necessary to make reasonable progress, the source's existing measures are generally necessary to make reasonable progress and must be included in the SIP. However, there may be circumstances in which a state can demonstrate that a source's existing measures are *not* necessary to make reasonable progress. Specifically, if a state can demonstrate that a source will continue to implement its existing measures and will not increase its emissions rate, it

³⁹ States may choose to, but are not required to, include measures in their long-term strategies beyond just the emission reduction measures that are necessary for reasonable progress. See 2021 Clarifications Memo at 16. For example, states with smoke management programs may choose to submit their smoke management plans to the EPA for inclusion in their SIPs but are not required to do so. See, *e.g.*, 82 FR at 3108–09 (requirement to consider smoke management practices and smoke management programs under 40 CFR 51.308(f)(2)(iv) does not require states to adopt such practices or programs into their SIPs, although they may elect to do so).

may not be necessary to have those measures in the long-term strategy to prevent future emissions increases and future visibility impairment. The EPA's 2021 Clarifications Memo provides further explanation and guidance on how states may demonstrate that a source's existing measures are not necessary to make reasonable progress. See 2021 Clarifications Memo at 8–10. If the state can make such a demonstration, it need not include a source's existing measures in the long-term strategy or its SIP.

As with source selection, the characterization of information on each of the factors is also subject to the documentation requirement in § 51.308(f)(2)(iii). The reasonable progress analysis, including source selection, information gathering, characterization of the four statutory factors (and potentially visibility), balancing of the four factors, and selection of the emission reduction measures that represent reasonable progress, is a technically complex exercise, but also a flexible one that provides states with bounded discretion to design and implement approaches appropriate to their circumstances. Given this flexibility, § 51.308(f)(2)(iii) plays an important function in requiring a state to document the technical basis for its decision making so that the public and the EPA can comprehend and evaluate the information and analysis the state relied upon to determine what emission reduction measures must be in place to make reasonable progress. The technical documentation must include the modeling, monitoring, cost, engineering, and emissions information on which the state relied to determine the measures necessary to make reasonable progress. This documentation requirement can be met through the provision of and reliance on technical analyses developed through a regional planning process, so long as that process and its output has been approved by all state participants. In addition to the explicit regulatory requirement to document the technical basis of their reasonable progress determinations, states are also subject to the general principle that those determinations must be reasonably moored to the statute.⁴⁰ That is, a state's decisions about the emission reduction measures that are necessary to

⁴⁰ See *Arizona ex rel. Darwin v. U.S. EPA*, 815 F.3d 519, 531 (9th Cir. 2016); *Nebraska v. EPA*, 812 F.3d 662, 668 (8th Cir. 2016); *North Dakota v. EPA*, 730 F.3d 750, 761 (8th Cir. 2013); *Oklahoma v. EPA*, 723 F.3d 1201, 1206, 1208–10 (10th Cir. 2013); *cf. Nat'l Parks Conservation Ass'n v. EPA*, 803 F.3d 151, 165 (3d Cir. 2015); *Alaska Dep't of Env'tl. Conservation v. EPA*, 540 U.S. 461, 485, 490 (2004).

³⁸ See, *e.g.*, Responses to Comments on Protection of Visibility: Amendments to Requirements for State Plans; Proposed Rule (81 FR 26942, May 4, 2016), Docket ID No. EPA-HQ-OAR-2015-0531, U.S. Environmental Protection Agency at 186; 2019 Guidance at 36–37.

make reasonable progress must be consistent with the statutory goal of remedying existing and preventing future visibility impairment.

The four statutory factors (and potentially visibility) are used to determine what emission reduction measures for selected sources must be included in a state's long-term strategy for making reasonable progress. Additionally, the RHR at 40 CFR 51.3108(f)(2)(iv) separately provides five "additional factors"⁴¹ that states must consider in developing their long-term strategies: (1) Emission reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment; (2) measures to reduce the impacts of construction activities; (3) source retirement and replacement schedules; (4) basic smoke management practices for prescribed fire used for agricultural and wildland vegetation management purposes and smoke management programs; and (5) the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the long-term strategy. The 2019 Guidance provides that a state may satisfy this requirement by considering these additional factors in the process of selecting sources for four-factor analysis, when performing that analysis, or both, and that not every one of the additional factors needs to be considered at the same stage of the process. See 2019 Guidance at 21. The EPA provided further guidance on the five additional factors in the 2021 Clarifications Memo, explaining that a state should generally not reject cost-effective and otherwise reasonable controls merely because there have been emission reductions since the first planning period owing to other ongoing air pollution control programs or merely because visibility is otherwise projected to improve at Class I areas. Additionally, states generally should not rely on these additional factors to summarily assert that the state has already made sufficient progress and, therefore, no sources need to be selected or no new controls are needed regardless of the outcome of four-factor analyses. 2021 Clarifications Memo at 13.

Because the air pollution that causes regional haze crosses state boundaries, § 51.308(f)(2)(ii) requires a state to consult with other states that also have emissions that are reasonably

anticipated to contribute to visibility impairment in a given Class I area. Consultation allows for each state that impacts visibility in an area to share whatever technical information, analyses, and control determinations may be necessary to develop coordinated emission management strategies. This coordination may be managed through inter- and intra-RPO consultation and the development of regional emissions strategies; additional consultations between states outside of RPO processes may also occur. If a state, pursuant to consultation, agrees that certain measures (e.g., a certain emission limitation) are necessary to make reasonable progress at a Class I area, it must include those measures in its SIP. 40 CFR 51.308(f)(2)(ii)(A). Additionally, the RHR requires that states that contribute to visibility impairment at the same Class I area consider the emission reduction measures the other contributing states have identified as being necessary to make reasonable progress for their own sources. 40 CFR 51.308(f)(2)(ii)(B). If a state has been asked to consider or adopt certain emission reduction measures, but ultimately determines those measures are not necessary to make reasonable progress, that state must document in its SIP the actions taken to resolve the disagreement. 40 CFR 51.308(f)(2)(ii)(C). The EPA will consider the technical information and explanations presented by the submitting state and the state with which it disagrees when considering whether to approve the state's SIP. See *id.*; 2019 Guidance at 53. Under all circumstances, a state must document in its SIP submission all substantive consultations with other contributing states. 40 CFR 51.308(f)(2)(ii)(C).

D. Reasonable Progress Goals

Reasonable progress goals "measure the progress that is projected to be achieved by the control measures states have determined are necessary to make reasonable progress based on a four-factor analysis." 82 FR at 3091. Their primary purpose is to assist the public and the EPA in assessing the reasonableness of states' long-term strategies for making reasonable progress towards the national visibility goal for Class I areas within the state. See 40 CFR 51.308(f)(3)(iii)–(iv). States in which Class I areas are located must establish two RPGs, both in deciviews—one representing visibility conditions on the clearest days and one representing visibility on the most anthropogenically impaired days—for each area within their borders. 40 CFR 51.308(f)(3)(i). The two RPGs are intended to reflect the

projected impacts, on the two sets of days, of the emission reduction measures the state with the Class I area, as well as all other contributing states, have included in their long-term strategies for the second implementation period.⁴² The RPGs also account for the projected impacts of implementing other CAA requirements, including non-SIP based requirements. Because RPGs are the modeled result of the measures in states' long-term strategies (as well as other measures required under the CAA), they cannot be determined before states have conducted their four-factor analyses and determined the control measures that are necessary to make reasonable progress. See 2021 Clarifications Memo at 6.

For the second implementation period, the RPGs are set for 2028. Reasonable progress goals are not enforceable targets, 40 CFR 51.308(f)(3)(iii); rather, they "provide a way for the states to check the projected outcome of the [long-term strategy] against the goals for visibility improvement." 2019 Guidance at 46. While states are not legally obligated to achieve the visibility conditions described in their RPGs, § 51.308(f)(3)(i) requires that "[t]he long-term strategy and the reasonable progress goals must provide for an improvement in visibility for the most impaired days since the baseline period and ensure no degradation in visibility for the clearest days since the baseline period." Thus, states are required to have emission reduction measures in their long-term strategies that are projected to achieve visibility conditions on the most impaired days that are better than the baseline period and that show no degradation on the clearest days compared to the clearest days from the baseline period. The baseline period for the purpose of this comparison is the baseline visibility condition—the annual average visibility condition for the period 2000–2004. See 40 CFR 51.308(f)(1)(i), 82 FR at 3097–98.

So that RPGs may also serve as a metric for assessing the amount of progress a state is making towards the national visibility goal, the RHR

⁴¹ The five "additional factors" for consideration in § 51.308(f)(2)(iv) are distinct from the four factors listed in CAA section 169A(g)(1) and 40 CFR 51.308(f)(2)(i) that states must consider and apply to sources in determining reasonable progress.

⁴² RPGs are intended to reflect the projected impacts of the measures all contributing states include in their long-term strategies. However, due to the timing of analyses, control determinations by other states, and other on-going emissions changes, a particular state's RPGs may not reflect all control measures and emissions reductions that are expected to occur by the end of the implementation period. The 2019 Guidance provides recommendations for addressing the timing of RPG calculations when states are developing their long-term strategies on disparate schedules, as well as for adjusting RPGs using a post-modeling approach. 2019 Guidance at 47–48.

requires states with Class I areas to compare the 2028 RPG for the most impaired days to the corresponding point on the URP line (representing visibility conditions in 2028 if visibility were to improve at a linear rate from conditions in the baseline period of 2000–2004 to natural visibility conditions in 2064). If the most impaired days RPG in 2028 is above the URP (*i.e.*, if visibility conditions are improving more slowly than the rate described by the URP), each state that contributes to visibility impairment in the Class I area must demonstrate, based on the four-factor analysis required under 40 CFR 51.308(f)(2)(i), that no additional emission reduction measures would be reasonable to include in its long-term strategy. 40 CFR 51.308(f)(3)(ii). To this end, 40 CFR 51.308(f)(3)(ii) requires that each state contributing to visibility impairment in a Class I area that is projected to improve more slowly than the URP provide “a robust demonstration, including documenting the criteria used to determine which sources or groups [of] sources were evaluated and how the four factors required by paragraph (f)(2)(i) were taken into consideration in selecting the measures for inclusion in its long-term strategy.” The 2019 Guidance provides suggestions about how such a “robust demonstration” might be conducted. See 2019 Guidance at 50–51.

The 2017 RHR, 2019 Guidance, and 2021 Clarifications Memo also explain that projecting an RPG that is on or below the URP based on only on-the-books and/or on-the-way control measures (*i.e.*, control measures already required or anticipated before the four-factor analysis is conducted) is not a “safe harbor” from the CAA’s and RHR’s requirement that all states must conduct a four-factor analysis to determine what emission reduction measures constitute reasonable progress. The URP is a planning metric used to gauge the amount of progress made thus far and the amount left before reaching natural visibility conditions. However, the URP is not based on consideration of the four statutory factors and therefore cannot answer the question of whether the amount of progress being made in any particular implementation period is “reasonable progress.” See 82 FR at 3093, 3099–3100; 2019 Guidance at 22; 2021 Clarifications Memo at 15–16.

E. Monitoring Strategy and Other State Implementation Plan Requirements

Section 51.308(f)(6) requires states to have certain strategies and elements in place for assessing and reporting on visibility. Individual requirements

under this section apply either to states with Class I areas within their borders, states with no Class I areas but that are reasonably anticipated to cause or contribute to visibility impairment in any Class I area, or both. A state with Class I areas within its borders must submit with its SIP revision a monitoring strategy for measuring, characterizing, and reporting regional haze visibility impairment that is representative of all Class I areas within the state. SIP revisions for such states must also provide for the establishment of any additional monitoring sites or equipment needed to assess visibility conditions in Class I areas, as well as reporting of all visibility monitoring data to the EPA at least annually. Compliance with the monitoring strategy requirement may be met through a state’s participation in the Interagency Monitoring of Protected Visual Environments (IMPROVE) monitoring network, which is used to measure visibility impairment caused by air pollution at the 156 Class I areas covered by the visibility program. 40 CFR 51.308(f)(6), (f)(6)(i), (f)(6)(iv). The IMPROVE monitoring data is used to determine the 20% most anthropogenically impaired and 20% clearest sets of days every year at each Class I area and tracks visibility impairment over time.

All states’ SIPs must provide for procedures by which monitoring data and other information are used to determine the contribution of emissions from within the state to regional haze visibility impairment in affected Class I areas. 40 CFR 51.308(f)(6)(ii) and (iii). Section 51.308(f)(6)(v) further requires that all states’ SIPs provide for 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 the most recent year for which data are available and estimates of future projected emissions. States must also include commitments to update their inventories periodically. The inventories themselves do not need to be included as elements in the SIP and are not subject to the EPA’s review as part of the Agency’s evaluation of a SIP revision.⁴³ All states’ SIPs must also provide for any other elements, including reporting, recordkeeping, and other measures, that are necessary for states to assess and report on visibility. 40 CFR 51.308(f)(6)(vi). Per the 2019 Guidance, a state may note in its regional haze SIP that its compliance

⁴³ See “Step 8: Additional requirements for regional haze SIPs” in the 2019 Guidance at 55.

with the Air Emissions Reporting Rule (AERR) in 40 CFR part 51, subpart A satisfies the requirement to provide for an emissions inventory for the most recent year for which data are available. To satisfy the requirement to provide estimates of future projected emissions, a state may explain in its SIP how projected emissions were developed for use in establishing RPGs for its own and nearby Class I areas.⁴⁴

Separate from the requirements related to monitoring for regional haze purposes under 40 CFR 51.308(f)(6), the RHR also contains a requirement at § 51.308(f)(4) related to any additional monitoring that may be needed to address visibility impairment in Class I areas from a single source or a small group of sources. This is called “reasonably attributable visibility impairment.”⁴⁵ Under this provision, if the EPA or the FLM of an affected Class I area has advised a state that additional monitoring is needed to assess reasonably attributable visibility impairment, the state must include in its SIP revision for the second implementation period an appropriate strategy for evaluating such impairment.

F. Requirements for Periodic Reports Describing Progress Towards the Reasonable Progress Goals

Section 51.308(f)(5) requires a state’s regional haze SIP revision to address the requirements of paragraphs 40 CFR 51.308(g)(1) through (5) so that the plan revision due in 2021 will serve also as a progress report addressing the period since submission of the progress report for the first implementation period. The regional haze progress report requirement is designed to inform the public and the EPA about a state’s implementation of its existing long-term strategy and whether such implementation is in fact resulting in the expected visibility improvement. See 81 FR 26942, 26950 (May 4, 2016), (82 FR at 3119, January 10, 2017). To this end, every state’s SIP revision for the second implementation period is required to describe the status of implementation of all measures included in the state’s long-term strategy, including BART and reasonable progress emission reduction measures from the first implementation period, and the resulting emissions reductions. 40 CFR 51.308(g)(1) and (2).

A core component of the progress report requirements is an assessment of

⁴⁴ *Id.*

⁴⁵ The EPA’s visibility protection regulations define “reasonably attributable visibility impairment” as “visibility impairment that is caused by the emission of air pollutants from one, or a small number of sources.” 40 CFR 51.301.

changes in visibility conditions on the clearest and most impaired days. For second implementation period progress reports, § 51.308(g)(3) requires states with Class I areas within their borders to first determine current visibility conditions for each area on the most impaired and clearest days, 40 CFR 51.308(g)(3)(i), and then to calculate the difference between those current conditions and baseline (2000–2004) visibility conditions to assess progress made to date. See 40 CFR 51.308(g)(3)(ii). States must also assess the changes in visibility impairment for the most impaired and clearest days since they submitted their first implementation period progress reports. See 40 CFR 51.308(g)(3)(iii), (f)(5). Since different states submitted their first implementation period progress reports at different times, the starting point for this assessment will vary state by state.

Similarly, states must provide analyses tracking the change in emissions of pollutants contributing to visibility impairment from all sources and activities within the state over the period since they submitted their first implementation period progress reports. See 40 CFR 51.308(g)(4), (f)(5). Changes in emissions should be identified by the type of source or activity. Section 51.308(g)(5) also addresses changes in emissions since the period addressed by the previous progress report and requires states' SIP revisions to include an assessment of any significant changes in anthropogenic emissions within or outside the state. This assessment must explain whether these changes in emissions were anticipated and whether they have limited or impeded progress in reducing emissions and improving visibility relative to what the state projected based on its long-term strategy for the first implementation period.

G. Requirements for State and Federal Land Manager Coordination

CAA section 169A(d) requires that before a state holds a public hearing on a proposed regional haze SIP revision, it must consult with the appropriate FLM or FLMs; pursuant to that consultation, the state must include a summary of the FLMs' conclusions and recommendations in the notice to the public. Consistent with this statutory requirement, the RHR also requires that states "provide the [FLM] with an opportunity for consultation, in person and at a point early enough in the State's policy analyses of its long-term strategy emission reduction obligation so that information and recommendations provided by the [FLM] can meaningfully inform the State's decisions on the long-term

strategy." 40 CFR 51.308(i)(2). Consultation that occurs 120 days prior to any public hearing or public comment opportunity will be deemed "early enough," but the RHR provides that in any event the opportunity for consultation must be provided at least 60 days before a public hearing or comment opportunity. This consultation must include the opportunity for the FLMs to discuss their assessment of visibility impairment in any Class I area and their recommendations on the development and implementation of strategies to address such impairment. 40 CFR 51.308(i)(2). For the EPA to evaluate whether FLM consultation meeting the requirements of the RHR has occurred, the SIP submission should include documentation of the timing and content of such consultation. The SIP revision submitted to the EPA must also describe how the state addressed any comments provided by the FLMs. 40 CFR 51.308(i)(3). Finally, a SIP revision 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. 40 CFR 51.308(i)(4).

IV. The EPA's Evaluation of Wyoming's Regional Haze Plan for the Second Implementation Period

In section IV. of this document, we describe Wyoming's 2022 SIP submission and evaluate it against the requirements of the CAA and RHR for the second implementation period of the regional haze program.

A. Identification of Class I Areas

Section 169A(b)(2) of the CAA requires each state in which any Class I area is located or "the emissions from which may reasonably be anticipated to cause or contribute to any impairment of visibility" in a Class I area to have a long-term strategy for making reasonable progress toward the national visibility goal. The RHR implements this statutory requirement in 40 CFR 51.308(f) for the second and subsequent planning periods for regional haze. 40 CFR 51.308(f)(2) requires states to submit a long-term strategy that addresses regional haze visibility impairment for each mandatory Class I area within the state and for each mandatory Class I area located outside the state that may be affected by emissions from the state.

There are seven designated Class I areas within the State of Wyoming, including two national parks managed

by the U.S. National Parks Service (Grand Teton National Park and Yellowstone National Park) and five wilderness areas managed by the U.S. Forest Service (Bridger Wilderness Area, Fitzpatrick Wilderness Area, North Absaroka Wilderness Area, Teton Wilderness Area, and Washakie Wilderness Area).⁴⁶

Grand Teton National Park, established in 1929, occupies 305,504 acres along the Teton Range and Jackson Lake. It is adjacent to the Teton Wilderness Area to the northeast and is 6 miles south of Yellowstone National Park. In 2018, Grand Teton National Park had 3,491,151 visitors.

Yellowstone National Park became the world's first national park on March 1, 1872, and occupies 2,020,625 acres⁴⁷ in northwestern Wyoming, overlapping into Montana and Idaho. In 2018, Yellowstone National Park had 4,114,999 visitors.

The Bridger Wilderness Area, consisting of 392,160 acres, is situated on the western slope of the Wind River Range in Wyoming and extends approximately 80 miles along the western slope of the Continental Divide. It lies south of the other six Class I areas in Wyoming and is on the western border of the Fitzpatrick Wilderness Area.

The Fitzpatrick Wilderness Area, designated in 1976, occupies 191,103 acres and is located on the east slope of the northern Wind River Range in Wyoming along the Continental Divide, which makes up its western border. It shares its western border with the Bridger Wilderness Area and its eastern border with the Wind River Indian Reservation.

The North Absaroka Wilderness Area, designated in 1964, is part of the Greater Yellowstone Area of northwestern Wyoming. It is located along the northeastern boundary of Yellowstone National Park, east of the Continental Divide, and occupies 351,104 acres.

The Teton Wilderness Area encompasses 557,311 acres that straddle the Continental Divide in western Wyoming. It is bordered by Yellowstone National Park to the north, Grand Teton National Park to the west, and the Washakie Wilderness Area to the east.

The Washakie Wilderness Area encompasses 686,584 acres. It is bordered on the west by the Teton Wilderness Area and Yellowstone

⁴⁶ Wyoming 2022 SIP submission at 20, 35–57.

⁴⁷ Yellowstone National Park has 2,219,737 acres overall, of which 2,020,625 acres are in Wyoming. EPA. List of Areas Protected by the Regional Haze Program. <https://www.epa.gov/visibility/list-areas-protected-regional-haze-program>.

National Park, and the North Absaroka Wilderness Area lies to the north. Additionally, Wyoming identified 16 Class I areas outside the State where visibility may be affected by Wyoming sources (table 1).⁴⁸

TABLE 1—CLASS I AREAS IN OTHER STATES THAT MAY BE AFFECTED BY WYOMING SOURCES

State	Class I area
Colorado	Eagles Nest Wilderness Area.
Colorado	Flat Tops Wilderness Area.
Colorado	Maroon Bells-Snowmass Wilderness Area.
Colorado	Mount Zirkel.
Colorado	Rawah Wilderness.
Colorado	Rocky Mountain National Park.
Colorado	West Elk Wilderness.
Idaho	Craters of the Moon National Monument.
Montana	Red Rocks Lakes National Wildlife Refuge.
North Dakota	Theodore Roosevelt National Park.
Nevada	Jarvis Wilderness.
South Dakota	Badlands/Sage Creek Wilderness.
South Dakota	Wind Cave National Park.
Utah	Arches National Park.
Utah	Canyonlands National Park.
Utah	Capitol Reef National Park.

B. Calculation of Baseline, Current, and Natural Visibility Conditions; Progress to Date; and Uniform Rate of Progress for Class I Areas Within the State

Section 51.308(f)(1) requires states to determine the following for “each mandatory Class I Federal area located within the State”: baseline visibility conditions for the most impaired and clearest days, natural visibility

conditions for the most impaired and clearest days, progress to date for the most impaired and clearest days, the differences between current visibility conditions and natural visibility conditions, and the URP. This section also provides the option for states to propose adjustments to the URP line for a Class I area to account for visibility impacts from anthropogenic sources outside the United States and/or the

impacts from wildland prescribed fires that were conducted for certain specified objectives. 40 CFR 51.308(f)(1)(vi)(B).

The IMPROVE monitoring network measures visibility impairment caused by air pollution at Class I areas. Wyoming’s 2022 SIP submission provides visibility conditions for each IMPROVE monitor and associated Class I area in Wyoming (table 2).⁴⁹

TABLE 2—VISIBILITY CONDITIONS (DECIVIEWS) FOR WYOMING IMPROVE STATIONS

Monitor ID	Class I areas	Baseline (2000–2004)	Period (2008–2012)	Current (2014–2018)	Natural (2064)	Progress since baseline (2000–2004)–(2014–2018)	Progress during last implementation period (2008–2012)–(2014–2018)	Difference between current (2014–2018) and natural (2064)
Most Impaired Days								
YELL2	Yellowstone National Park, Grand Teton National Park, Teton Wilderness Area.	8.3	7.5	7.5	4.0	0.8	0	3.5
NOAB1	Washakie Wilderness Area, North Absaroka Wilderness Area.	8.8	7.7	7.2	4.5	1.6	0.5	2.7
BRID1	Bridger Wilderness Area, Fitzpatrick Wilderness Area.	8.0	7.2	6.8	3.9	1.2	0.4	3.5
Clearest Days								
YELL2	Yellowstone National Park, Grand Teton National Park, Teton Wilderness Area.	2.6	1.5	1.4	0.4	1.1	0.1	1
NOAB1	Washakie Wilderness Area, North Absaroka Wilderness Area.	2.0	1.4	0.7	0.6	1.3	0.7	0.1
BRID1	Bridger Wilderness Area, Fitzpatrick Wilderness Area.	2.1	1.1	0.9	0.3	1.2	0.2	0.6

The State also determined the uniform rate of progress for the most impaired and clearest days for all Wyoming Class I areas.⁵⁰ Under 40 CFR

51.308(f)(1)(vi)(B), Wyoming chose to adjust the uniform rate of progress glidepath for all the State’s Class I areas to account for impacts from

anthropogenic sources outside the United States and impacts from wildland prescribed fires.^{51 52} Wyoming also provided haze indices and the

⁴⁸ To identify Class I areas in other states that may be affected by emissions from Wyoming sources, the State used a threshold of Q/d > 10. Wyoming 2022 SIP submission at 64–67.

⁴⁹ Wyoming 2022 SIP submission at 34–63.

⁵⁰ Wyoming 2022 SIP submission at Figures 6–9 and 6–10 (YELL2), Figures 6–18 and 6–19 (NOAB1), and Figures 6–26 and 6–27 (BRID1).

⁵¹ Wildland prescribed fires are those conducted with the objective to establish, restore, and/or maintain sustainable and resilient wildland

ecosystems, to reduce the risk of catastrophic wildfires, and/or to preserve endangered or threatened species during which appropriate basic smoke management practices were applied.

⁵² Wyoming 2022 SIP submission at 239–242.

uniform rate of progress for IMPROVE monitors and associated Class I areas outside the State.⁵³

Based on the information provided in Chapter 6 of Wyoming’s 2022 SIP submission, the EPA is proposing to approve the State’s visibility condition calculations for Grand Teton National Park, Yellowstone National Park, Bridger Wilderness Area, Fitzpatrick Wilderness Area, North Absaroka Wilderness Area, Teton Wilderness Area, and Washakie Wilderness Area, as meeting the requirements of 40 CFR 51.308(f)(1) related to the calculations of baseline, current, and natural visibility conditions; progress to date; and the URP.

C. Long-Term Strategy

Each state having a Class I area within its borders or emissions that may affect visibility in any Class I area outside the state must develop a long-term strategy for making reasonable progress towards the national visibility goal for each impacted Class I area. CAA section 169A(b)(2)(B). As explained in the Background section of this document, reasonable progress is achieved when all states contributing to visibility impairment in a Class I area are implementing the measures determined—through application of the four statutory factors to sources of visibility impairing pollutants—to be necessary to make reasonable progress. 40 CFR 51.308(f)(2)(i). Each state’s long-term strategy must include the enforceable emission limitations, compliance schedules, and other measures that are necessary to make reasonable progress. 40 CFR 51.308(f)(2). All new (*i.e.*, additional)

measures that are the outcome of four-factor analyses are necessary to make reasonable progress and must be in the long-term strategy. If the outcome of a four-factor analysis and other measures necessary to make reasonable progress is that no new measures are reasonable for a source, that source’s existing measures are necessary to make reasonable progress, unless the state can demonstrate that the source will continue to implement those measures and will not increase its emission rate. Existing measures that are necessary to make reasonable progress must also be in the long-term strategy. In developing its long-term strategy, a state must also consider the five additional factors in 40 CFR 51.308(f)(2)(iv). As part of its reasonable progress determinations, the state must describe the criteria used to determine which sources or group of sources were evaluated (*i.e.*, subjected to four-factor analysis) for the second implementation period and how the four factors were taken into consideration in selecting the emission reduction measures for inclusion in the long-term strategy. 40 CFR 51.308(f)(2)(iii).

1. Summary of Wyoming’s 2022 SIP Submission

Wyoming identified 23 Class I areas that must be addressed in its long-term strategy.⁵⁴ Under 40 CFR 51.308(f)(2)(i), SIP submittals must include a description of the criteria a state used to determine which sources or groups of sources to evaluate through four-factor analysis. Wyoming used a Q/d screening approach to identify sources for four-factor analysis. The Q/d screening metric uses a source’s annual emissions

in tons (Q) divided by the distance in kilometers (d) between the source and the nearest Class I area, along with a reasonably selected threshold for this metric. The larger the Q/d value, the greater the source’s expected effect on visibility in each associated Class I area. Wyoming opted to use the Q/d screening metric because, according to the State, it accounts for three of the largest anthropogenically-sourced pollutants (NO_x, SO₂, and PM) that contribute to visibility impairment in Wyoming Class I areas.⁵⁵

Using a screening threshold of Q/d > 10 and emissions information from the 2014 National Emission Inventory (NEI), Wyoming initially identified 20 sources in the State that may be affecting visibility at Class I areas in Wyoming and surrounding states.⁵⁶ Upon contacting the identified sources, the State received updated emissions information from 14 of the 20 sources,⁵⁷ and the State further revised emissions values for the sources that did not provide updated emissions information to reflect the 2017 NEI.⁵⁸ Using updated emissions information to calculate Q/d, the State screened out five sources because they fell below its Q/d threshold of 10.⁵⁹ Three coal facilities (Antelope Mine, Black Thunder Mine, and North Antelope Rochelle Mine) were also screened out from further consideration based on the State’s assessment that coarse mass PM, the primary component of emissions from those mines, has relatively little effect on visibility in Class I areas and should not be included in the mines’ Q values.⁶⁰ Ultimately, the State selected twelve sources to perform a four-factor analysis (table 3).

TABLE 3—FACILITIES SCREENED IN USING Q/d AND CLASS I AREA WITH MAXIMUM Q/d

Facility name	Class I area with maximum Q/d	Class I area state	Distance (km) to Class I area	Updated Q/d value (tpy/km)			
				NO _x + SO ₂ + PM ₁₀	NO _x	SO ₂	PM ₁₀
Jim Bridger Power Plant (<i>PacifiCorp</i>).	Bridger Wilderness Area ..	WY	97.39	160	83.75	68.48	7.77
Laramie River Station Power Plant (<i>Basin Electric</i>).	Rawah Wilderness Area ..	CO	164.27	85.89	36.25	42.80	6.85
Laramie Portland Cement (<i>Mountain Cement Company</i>).	Rocky Mountain National Park.	CO	30.54	82.23	73.16	4.19	4.87
Naughton Power Plant (<i>PacifiCorp</i>)	Bridger Wilderness Area ..	WY	141.64	78.57	39.31	28.58	10.68
Dave Johnston Power Plant (<i>PacifiCorp</i>).	Wind Cave National Park	SD	198.38	77.33	32.15	41.38	3.80
Green River Works (<i>TATA Chemicals</i>).	Bridger Wilderness Area ..	WY	122.11	43.81	16.08	18.52	9.22
Westvaco Facility (<i>Genesis Alkali</i>)	Bridger Wilderness Area ..	WY	122.62	38.23	17.04	11.96	9.23

⁵³ Wyoming 2022 SIP submission at 70–106.

⁵⁴ Wyoming 2022 SIP submission at 34, 64.

⁵⁵ Wyoming 2022 SIP submission at Figures 8–1 and 8–2 (YELL2), Figures 8–3 and 8–4 (NOAB1), and Figures 8–5 and 8–6 (BRID1), and 121.

⁵⁶ Wyoming 2022 SIP submission at Figure 10–1.

⁵⁷ The State did not receive updated emissions information from Westvaco, Wyodak, Laramie

Portland Cement, Naughton Power Plant, Dave Johnston Power Plant, and Rock Springs Coke Production Facility. Wyoming 2022 SIP submission at 125–26.

⁵⁸ Wyoming noted that the 2017 NEI was released in April 2020, after sources were asked to prepare four-factor analyses. Wyoming 2022 SIP submission at 125.

⁵⁹ Rock Springs Coke Production Facility, Cordero Rojo Complex, Solvay Green River Soda Ash Plant, Simplot Rock Springs Fertilizer Complex, and HollyFrontier Refinery. Wyoming 2022 SIP submission at 128.

⁶⁰ Wyoming 2022 SIP submission at 128–130 and appendix B.

TABLE 3—FACILITIES SCREENED IN USING Q/d AND CLASS I AREA WITH MAXIMUM Q/d—Continued

Facility name	Class I area with maximum Q/d	Class I area state	Distance (km) to Class I area	Updated Q/d value (tpy/km)			
				NO _x + SO ₂ + PM ₁₀	NO _x	SO ₂	PM ₁₀
Wyodak Power Plant (<i>PacifiCorp</i>) ..	Wind Cave National Park	SD	167.23	37.53	21.89	14.65	0.99
Elk Basin Gas Plant (<i>Contango Resources, Inc.</i>).	North Absaroka Wilderness Area.	WY	52.84	27.64	16.58	10.82	0.24
Granger Soda Ash Facility (<i>Genesis Alkali</i>).	Bridger Wilderness Area ..	WY	119.74	15.49	10.94	1.62	2.93
Lost Cabin Gas Plant (<i>Burlington Resources</i>).	Washakie Wilderness Area.	WY	132.94	13.06	0.54	12.28	0.24
Cheyenne Fertilizer (<i>Dyno Nobel Inc.</i>).	Rocky Mountain National Park.	CO	81.73	12.33	8.57	0.01	3.76

The State then requested each of the twelve sources to submit four-factor analyses for its review and consideration.⁶¹ As described in this document, some sources elected not to do so, arguing that four-factor analysis should not be required for their facilities. Wyoming attached the facilities’ four-factor analyses (or other submissions) as Appendices C–L to its 2022 SIP submission. Chapter 11 of the SIP submission contains Wyoming’s evaluation of the four statutory factors for each source (or the reasons for not performing a four-factor analysis) and

Wyoming’s determinations of the source-specific emission reduction measures necessary to make reasonable progress. In sections IV.C.1.a.–l. of this document, we summarize the four-factor analyses or other facility submissions for the twelve selected sources.

a. PacifiCorp—Jim Bridger Power Plant⁶²

PacifiCorp’s Jim Bridger Power Plant is located in Sweetwater County, Wyoming. Jim Bridger is comprised of four identically sized nominal 530 megawatts (MW) tangentially coal-fired

boilers that have a total net generating capacity of 2,120 MW. Emissions from Jim Bridger may affect visibility in 17 Class I areas in Colorado, Montana, Utah, and Wyoming (table 32 in section IV.C.2.a. of this document).

Neither the State nor PacifiCorp conducted a four-factor analysis for this source. Relying on the “facility analysis information” submitted by PacifiCorp (appendix C to Wyoming’s 2022 SIP submission), the State concluded that Jim Bridger Units 1–4 already have effective NO_x and SO₂ emission control technologies in place (table 4).

TABLE 4—INSTALLED NO_x AND SO₂ EMISSIONS CONTROLS AT JIM BRIDGER UNITS 1–4

Unit	SO ₂ controls	NO _x controls
1	FGD ¹	LNB ² /SOFA. ³
2	FGD	LNB/SOFA.
3	FGD	LNB/SOFA + SCR. ⁴
4	FGD	LNB/SOFA + SCR.

¹ Flue gas desulfurization (FGD).

² Low NO_x burners (LNB).

³ Separated overfire air (SOFA).

⁴ Selective catalytic reduction (SCR).

Additionally, the State describes a consent decree between Wyoming and PacifiCorp allowing for the short-term continued operation of Jim Bridger Units 1–2, subject to lower plant-wide month-by-month permitted emission limits and an annual emissions cap for NO_x and SO₂, until Units 1–2 are converted to natural gas in 2024.⁶³ Finally, the State notes that dry sorbent injection (DSI) was not recommended for Jim Bridger because the existing SO₂ controls are more efficient.

In its response to the State’s initial request to submit a four-factor analysis,⁶⁴ PacifiCorp asserted that Jim Bridger should be excluded from that requirement, and consequently the

facility should not be analyzed or required to install any additional controls or take further actions during the regional haze second planning period. First, PacifiCorp claimed that Jim Bridger Units 1–4 already have effective NO_x and SO₂ controls in place, thereby exempting these units from further analysis. Specifically, PacifiCorp referenced: (1) FGD scrubber systems, installed on all units, as meeting the applicable alternative SO₂ emission limit of the 2012 Mercury and Air Toxics Standards (MATS); (2) LNB/SOFA NO_x emission controls installed in 2010 (Unit 1), 2006 (Unit 2), 2007 (Unit 3), and 2008 (Unit 4); and (3) SCR NO_x emission controls installed in 2015

(Unit 3) and 2016 (Unit 4). PacifiCorp also referenced plant-wide monthly-block NO_x and SO₂ emission limits, which it stated have been demonstrated to achieve greater reasonable progress and visibility improvement than could be achieved through installation of SCR at Jim Bridger Units 1 and 2 and at a substantially lower cost. PacifiCorp contended that these circumstances align with the examples provided in the EPA’s 2019 Guidance, which detail scenarios⁶⁵ in which it may be reasonable for a state not to select a particular source for further analysis, including: (1) FGD controls that meet the applicable alternative SO₂ emission limit of the 2012 MATS rule for power

⁶¹ Id. at 123–25.

⁶² This facility is addressed at pages 134–35 and appendix C of the Wyoming 2022 SIP submission.

⁶³ The consent decree was approved by the Wyoming First Judicial District Court on February 14, 2022, and requires Jim Bridger Units 1 and 2 to convert to natural gas with NO_x emission limits of 0.12 lb/MMBtu (30-day rolling average) and

1,314 tons/year per unit along with a 41.6% reduction in maximum heat input.

⁶⁴ Wyoming 2022 SIP submission, appendix C.

⁶⁵ 2019 Guidance at 22–25.

plants; (2) NO_x and SO₂ controls that were installed during the first planning period and operate year-round with an effectiveness of at least 90 percent on a pollutant-specific basis (e.g., FGD or SCR); and (3) BART-eligible units that installed and began operating controls to meet BART emission limits for the first regional haze implementation period.

Second, PacifiCorp argued that recent decision making regarding emission controls for the first implementation period and PacifiCorp’s installation of post-combustion controls during that period should exempt Jim Bridger from further analysis during the second implementation period. PacifiCorp referenced the reasonable progress “reassessment” conducted under 40 CFR 51.308(d)(1) for the first implementation period, which led to Wyoming’s submission of a first implementation period SIP revision containing emission limits associated with the conversion from coal-firing to natural gas-firing at Units 1–2.⁶⁶ PacifiCorp also highlighted the 2015–2016 installation of SCR on Units 3–4 and FGD scrubbers upgraded on Units 1–4 between 2008–2011. PacifiCorp argued that these first implementation period controls eliminate the need for a four-factor analysis for the second implementation period, pointing to the

EPA’s statement in the 2019 Guidance that “it may be appropriate for a state to rely on a previous . . . reasonable progress analysis for the characterization of a factor, for example information developed in the first implementation period on the availability, cost, and effectiveness of controls for a particular source, if the previous analysis was sound and no significant new information is available.”⁶⁷

Third, PacifiCorp asserted that Jim Bridger Units 1–2 are exempt from four-factor analysis for the second implementation period because, under the company’s 2019 Integrated Resource Plan (IRP), Unit 1 was scheduled for retirement by the end of 2023 and Unit 2 was scheduled for retirement before the end of 2028.⁶⁸ Those scheduled closures both fall within the second planning period, although PacifiCorp acknowledged it is not subject to an enforceable obligation to close any units at Jim Bridger.

Lastly, PacifiCorp stated that under the EPA’s 2019 Guidance, Wyoming may consider changes in operating parameters, such as those resulting from renewable energy sources coming online, to exempt Jim Bridger Units 1–4 from four-factor analysis. PacifiCorp cited its 2019 IRP,⁶⁹ which documents plans to make operational adjustments

at Jim Bridger to accommodate renewable energy resources. PacifiCorp stated that these changes will cause future emissions at Jim Bridger to differ significantly from historical emissions.

b. PacifiCorp—Naughton Power Plant⁷⁰

PacifiCorp’s Naughton Power Plant is located in Lincoln County, Wyoming. Naughton is comprised of two tangentially-fired units burning pulverized coal (Units 1–2) and one natural gas-fired unit (Unit 3), which have a total net generating capacity of 700 MW. Emissions from Naughton may affect the visibility in 17 Class I areas in Colorado, Idaho, Montana, Nevada, Utah, and Wyoming (table 32).

Neither the State nor PacifiCorp conducted a four-factor analysis for Naughton. Instead, Wyoming refers to the “facility analysis information” submitted by PacifiCorp, which Wyoming included as appendix C in its 2022 SIP submission. The State references PacifiCorp’s 2019 IRP, which includes the planned retirement of Units 1 and 2 by the end of 2025.⁷¹ Unit 3 ceased coal combustion in 2019 and converted to natural gas that same year. The State also notes that Naughton Units 1–2 already have NO_x and SO₂ emission control technologies in place (table 5).

TABLE 5—INSTALLED NO_x AND SO₂ EMISSIONS CONTROLS AT NAUGHTON UNITS 1–2

Unit	SO ₂ controls	NO _x controls
1	FGD	LNB/SOFA.
2	FGD	LNB/SOFA.

The State further explains that although its modeling incorporated the planned retirements and associated emissions reductions at Units 1–2, the State is not crediting the planned emissions reductions until the facility submits a permit application and the State issues a permit. The State notes that DSI is not being considered for Units 1–2 because the existing scrubbers are more effective for SO₂ removal. Wyoming states that it intends to conduct additional analysis on Units 1–2 in its 2025 regional haze progress report.

With respect to Naughton Unit 3, the State asserts that the 2019 conversion to natural gas resulted in a potential reduction of 8,909.5 tons of visibility impairing pollutants. The Q/d analysis of Naughton Unit 3 is 4.1, which the State notes is below its chosen threshold of Q/d > 10 for sources warranting a four-factor analysis.

In its response to the State’s initial request to submit a four-factor analysis,⁷² PacifiCorp asserted that its Naughton facility should be excluded from that requirement, and consequently should not be required to

install any additional controls or take further actions during the regional haze second implementation period. PacifiCorp relied on arguments similar to those it provided for Jim Bridger, discussed in section IV.C.1.a. above.

First, PacifiCorp cited its 2019 IRP preferred portfolio, which includes the planned retirement of Naughton Units 1–2 by the end of 2025 (before the end of the regional haze second planning period in 2028). PacifiCorp acknowledged that it is under no legal obligation to close those units by that time, but detailed the plans in its 2019

⁶⁶ If approved, Wyoming’s first planning period SIP submission would replace the State’s previously approved source-specific NO_x long-term strategy determination for Jim Bridger Units 1 and 2 of 0.07 lb/MMBtu for each unit, which is associated with the installation of SCR controls. Wyoming found that conversion from coal-firing to natural gas-firing, together with NO_x emission limits of 0.12 lb/MMBtu (30-day rolling average) and 1,314 tons/year, and a heat input limit of

21,900,000 MMBtu/year, allows for identical reasonable progress during the first planning period as the installation of SCR controls. The EPA issued a notice of proposed rulemaking on this first implementation period SIP submission, 89 FR 25200 (April 10, 2024), but has not yet taken final action.

⁶⁷ 2019 Guidance at 36.

⁶⁸ PacifiCorp Integrated Resource Plan, October 18, 2019. Volume I at 12–13.

⁶⁹ Id., Volume I at 8.

⁷⁰ This facility is addressed at pages 136–37 and appendix C of the Wyoming 2022 SIP submission.

⁷¹ Separately, and in the State’s discussion of the long-term strategy to set reasonable progress goals, Wyoming refers to the planned retirement of Naughton Units 1–2 by the end of 2025 to meet the requirements of the CCR rule. Wyoming 2022 SIP submission at 227.

⁷² Wyoming 2022 SIP submission, appendix C.

IRP to initiate closure of Units 1–2, complete regulatory notices and filings, engage in employee transition and community action plans, confirm transmission system reliability, and terminate, amend, or close out existing permits, contracts, and agreements.⁷³ PacifiCorp also pointed to the EPA’s coal combustion residuals (CCR) disposal rule as further impacting the certainty of closure for Naughton Units 1–2 if that rule is finalized as proposed. According to PacifiCorp, the CCR rule would require it to construct new, lined CCR impoundments that PacifiCorp claimed would prove uneconomical for its customers, or otherwise cease operation and close the CCR impoundments by 2028.

Second, PacifiCorp asserted that Naughton Units 1–3 already have effective NO_x and SO₂ controls in place, thereby exempting these units from further analysis. Specifically, PacifiCorp referenced: (1) FGD scrubber systems, installed on Unit 1 in 2011 and on Unit

2 in 2012, as meeting the applicable alternative SO₂ emission limit of the 2012 MATS rule; and (2) LNB/SOFA NO_x emission controls installed on Unit 1 in 2012 and on Unit 2 in 2011. Additionally, PacifiCorp explained that Unit 3 ceased coal-fired operation in 2019 and is undergoing conversion to natural gas. These NO_x and SO₂ emission control technologies, according to PacifiCorp, align with the examples provided in the EPA’s 2019 Guidance.

Third, PacifiCorp cited expected operational adjustments at Naughton to accommodate increases in renewable energy as an additional reason why a four-factor analysis is not required. PacifiCorp stated that Naughton’s 2028 projected operations, or lack thereof, indicate that the plant’s emissions will differ significantly from historical emissions due to PacifiCorp’s changing portfolio and market opportunities to increase both energy efficiency and renewable resources.

Finally, PacifiCorp concluded that given the planned retirements of Units 1–2, Naughton would fall below Wyoming’s Q/d threshold of >10 and should therefore be excluded from four-factor analysis at this time. According to PacifiCorp’s calculations, Unit 3 would be the only operating unit throughout the second implementation period and has a Q/d of 4.1 for the nearest Class I area (Bridger Wilderness).

c. Basin Electric—Laramie River Station Power Plant⁷⁴

Basin Electric’s Laramie River Station Power Plant is located in Platte County, Wyoming and is comprised of three 614 MW (gross) subbituminous coal-fired boilers. Emissions from Laramie River Station may affect the visibility in 10 Class I areas in Colorado, South Dakota, and Wyoming (table 32).

Table 6 describes the installed NO_x, SO₂, and PM emissions controls for all three units.

TABLE 6—INSTALLED NO_x, SO₂, AND PM EMISSIONS CONTROLS AT LARAMIE RIVER STATION 1–3

Unit	SO ₂ controls	NO _x controls	PM controls
1	Wet FGD	LNB/OFA ¹ + SCR	ESPs. ²
2	Wet FGD	LNB/OFA + SNCR ³	ESPs.
3	Dry FGD	LNB/OFA + SNCR	ESPs.

¹ Overfire air (OFA).

² Electrostatic precipitation (ESP).

³ Selective non-catalytic reduction (SNCR).

Relying on an analysis submitted by the facility (included as appendix D in the Wyoming 2022 SIP submission), the State conducted a four-factor analysis for NO_x and SO₂ controls, but not for PM controls. The State did not evaluate Unit 1 for further NO_x emissions controls because it is equipped with

SCR, which the State asserts is the best available control technology (BACT) for NO_x. The State evaluated SCR as the technically feasible option for further NO_x emissions control on Units 2 and 3 (table 7). For further SO₂ emissions control for Units 1 and 2, the State evaluated equipment upgrades and

chemical additives to the existing wet FGD controls as well as the installation of a 6th absorber vessel. For SO₂ emissions controls for Unit 3, the State evaluated converting the existing ESP to a fabric filter (FF) and replacing the existing ESP and installing a new stand-alone FF (table 8).

TABLE 7—SUMMARY OF LARAMIE RIVER STATION UNITS 2–3 NO_x COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
2	SCR	1,917	\$45,473,000	\$23,722
3	SCR	2,676	45,058,000	16,840

TABLE 8—SUMMARY OF LARAMIE RIVER STATION UNITS 1–3 SO₂ COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
1	Wet FGD upgrades	235	\$1,134,000	\$4,824
	Wet FGD additives	494	5,018,000	10,156
	6th absorber vessel	587	7,399,000	12,611
2	Wet FGD upgrades	266	1,167,000	4,388
	Wet FGD additives	559	7,266,000	12,998

⁷³ PacifiCorp Integrated Resource Plan, October 18, 2019. Volume I at 22–23.

⁷⁴ This facility is addressed at pages 137–42 and appendix D of the Wyoming 2022 SIP submission.

TABLE 8—SUMMARY OF LARAMIE RIVER STATION UNITS 1–3 SO₂ COST ANALYSIS—Continued

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
3	6th absorber vessel	664	10,068,000	15,168
	ESP to FF conversion	703	20,079,000	28,551
	ESP to FF replacement	703	25,022,000	35,580

The State estimated the time necessary to achieve compliance using SCR controls at Units 2 and 3 to be 60 months. It estimated the time necessary to achieve compliance at Units 1 and 2 using wet FGD upgrades as 11 months, wet FGD additives as 12 months, and addition of a 6th absorber vessel as 60 months. The State estimated the time necessary to achieve compliance with ESP to FF conversion to be 32 months and ESP to FF replacement to be 46 months. These timelines do not include the time associated with regulation development or SIP approval.

The State identified several energy and non-air environmental impacts associated with the installation and operation of potential controls at Laramie River Station. For SCR on Units 2 and 3, the State noted increased auxiliary power requirements and heat rate penalty, potential decrease in ammonia slip emissions, and potential increase in SO₂ emissions. For SO₂ controls on Units 1 and 2, the State observed that (1) wet FGD upgrades may result in increased limestone consumption, increased solid FGD by-product management and disposal, and increased auxiliary power requirements and heat rate penalty; (2) wet FGD additives may result in increased limestone consumption, high reagent consumption cost, increased solid FGD by-product management and disposal, and increased auxiliary power requirements and heat rate penalty; and (3) 6th absorber vessel addition may require capital intensive projects, resulting in relocation of existing dewatering equipment, increased limestone and water consumption, increased solid FGD by-product management and disposal, and increased auxiliary power requirements and heat rate penalty. Finally, as to converting the existing ESP to a FF or replacing the existing ESP with a FF, the State noted impacts from capital intensive projects, extended unit outage or unit derate, and increased auxiliary power requirements and heat rate penalty.

In its consideration of the remaining useful life of Laramie River Station Units 1–3, the State used the 20-year equipment life of the control measures.

Finally, the State highlighted that NO_x emissions are below the permitted⁷⁵ threshold and have been decreasing overall, particularly for Units 1 and 3. The State also noted that it did not expect permit conditions to change between 2020 and the third implementation period. Likewise, the State determined that SO₂ emissions have declined by over 780 tons/year between the three units, SO₂ emissions trends do not show an increase in emissions, and permit conditions are not anticipated to change between 2020 and the third planning period.

Ultimately, after considering the four factors, historical emissions data, and permit conditions, Wyoming determined that no additional controls are necessary on Laramie River Station Units 1–3 in the second planning period for regional haze. The State concluded that further controls will be evaluated in the third planning period.

d. PacifiCorp—Dave Johnston Power Plant⁷⁶

PacifiCorp’s Dave Johnston Power Plant is located in Converse County, Wyoming and is comprised of four coal-fired units using local subbituminous coal. Units 3 and 4 were both subject to BART in the first planning period. Unit 3 is a nominal 230 MW pulverized coal-fired boiler that commenced service in 1964 and has a federally enforceable commitment to shut down by December 31, 2027. Unit 4 is a nominal 361 MW pulverized coal-fired tangential boiler that commenced service in 1972 and is equipped with FGD for SO₂ control, LNB/SOFA for NO_x control, and a baghouse retrofit for PM control. Emissions from Dave Johnston may affect the visibility in 13 Class I areas in Colorado, South Dakota, and Wyoming (table 32).

Neither the State nor PacifiCorp conducted a four-factor analysis for Units 1–3. Instead, the State referenced information supplied by PacifiCorp in appendix C of Wyoming’s 2022 SIP submission and in PacifiCorp’s 2019 IRP. The 2019 IRP includes the planned retirement of Units 1 and 2 by the end

of 2027⁷⁷ and the federally enforceable retirement of Unit 3 by December 31, 2027.⁷⁸ The State explained that its modeling incorporated the planned retirements and associated emission reductions at Units 1–3. However, until the facility submits a permit application and the State issues a permit, the State is not crediting the planned emission reductions and intends to conduct additional analysis on Units 1–3 in its 2025 regional haze progress report.

In its response to the State’s initial request to submit a four-factor analysis,⁷⁹ PacifiCorp asserted that Dave Johnston should be excluded from that requirement, and consequently should not be required to install any additional controls or take further actions during the regional haze second planning period. PacifiCorp submitted a four-factor analysis only for Unit 4.

PacifiCorp argued that several factors alleviate the need for a four-factor analysis for Dave Johnston Units 1–3. First, PacifiCorp cited its 2019 IRP preferred portfolio, which includes the planned—but not federally enforceable—retirement of Dave Johnston Units 1–2 by the end of 2027 (before the end of the regional haze second planning period in 2028).⁸⁰ PacifiCorp also pointed to the EPA’s proposed revisions to the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category as further impacting the certainty of closure for Units 1–2 if the rules are finalized as proposed. PacifiCorp contended that the rules would require generating units like Dave Johnston Units 1–2 that currently rely on the discharge of treated bottom ash transport water into

⁷⁷ Separately, and in the State’s discussion of the long-term strategy to set reasonable progress goals, Wyoming refers to an enforceable federal commitment to close Dave Johnston Units 1–2 by the end of 2028 to meet the requirements of the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category for regulation of wastewater discharges from power plants. Wyoming 2022 SIP submission at 227.

⁷⁸ PacifiCorp Integrated Resource Plan, October 18, 2019. Volume I at 13.

⁷⁹ Wyoming 2022 SIP submission, appendix C.

⁸⁰ PacifiCorp Integrated Resource Plan, October 18, 2019. Volume I at 12–13.

⁷⁵ Wyoming Permit Number 3–2–102.

⁷⁶ This facility is addressed at pages 143–45 and appendix C of the Wyoming 2022 SIP submission.

a surface impoundment to close by December 31, 2028.

Second, PacifiCorp explained that Dave Johnston Unit 3 is subject to a federally enforceable requirement to shut down and is therefore not subject to four-factor analysis. As a result of its decision to pursue a shutdown compliance option provided in the EPA’s 2014 FIP, PacifiCorp requested that the State revise BART permit MD–6041A to include an enforceable requirement for Unit 3 to cease operation by December 31, 2027.

Third, PacifiCorp argued that Dave Johnston Unit 3 currently has effective

SO₂ and PM emissions control technology in place, which it asserted exempts this unit from further analysis. PacifiCorp referenced: (1) FGD scrubber systems, installed in 2010, as meeting the applicable alternative SO₂ emission limit of the 2012 MATS rule; and (2) a baghouse retrofit for PM emissions control installed in 2010. PacifiCorp argued that these SO₂ and PM emissions controls align with the examples provided in the EPA’s 2019 Guidance.

Finally, PacifiCorp urged Wyoming to consider changes in operating parameters at Dave Johnston Units 1–3 to accommodate increased deployment

of renewable energy resources in its portfolio. PacifiCorp stated that these operational adjustments will cause future emissions at Dave Johnston to decline compared to historical emissions. PacifiCorp argued that the EPA’s 2019 Guidance allows for consideration of such circumstances when evaluating the need for a four-factor analysis.

Unlike Units 1–3, the State performed a four-factor analysis for Dave Johnston Unit 4 for NO_x and SO₂ controls. Table 9 describes the installed NO_x, SO₂, and PM controls at Unit 4.

TABLE 9—INSTALLED NO_x, SO₂, AND PM EMISSIONS CONTROLS AT DAVE JOHNSTON, UNIT 4

Unit	SO ₂ controls	NO _x controls	PM controls
4	FGD; SDA ¹	LNB/OFA	FF baghouse.

¹Spray dryer absorber.

The State evaluated both SNCR and SCR as technically feasible options for NO_x control at Unit 4 (table 10). DSI was not evaluated for SO₂ control

because, according to the State, scrubber upgrades are more effective than DSI for incremental pollution control; no further SO₂ analysis was conducted. No

four-factor analysis for PM controls was provided.

TABLE 10—SUMMARY OF DAVE JOHNSTON UNIT 4 NO_x COST ANALYSIS

Control technology	Emission rate (lb/MMBtu) ¹	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
SNCR	0.12	187	\$2,889,000	\$15,411
SCR	0.05	1,035	11,881,000	11,480

¹ Pound per one million British thermal units (lb/MMBtu).

The State estimated the time necessary to achieve compliance using either SNCR or SCR at Unit 4 to be 2028, the end of the second planning period.

The State identified the following energy and non-air environmental impacts associated with the installation and operation of SCR: increased electrical energy to operate; the storage, use, and disposal of ammonia (a hazardous substance); and a potential increase in the amount of coal the unit would be required to burn to achieve the same amount of energy production, resulting in an increase of CCR waste requiring disposal, emissions of greenhouse gases, and consumption of water and other resources. The State also identified the storage and use of urea as a non-air environmental impact associated with the installation and operation of SNCR.

The State estimated the remaining useful life of Unit 4 to be 2027 based on PacifiCorp’s 2019 IRP. However, the State also noted that PacifiCorp used a

depreciable life of 20 years for SNCR and 30 years for SCR to estimate costs.

Based on the four-factor analysis, the State determined that installation of SNCR or SCR at Unit 4 is not cost-effective, would require long lead times before emissions reductions are achieved, would have negative energy and non-air environmental impacts, and would make the unit less likely to operate through the end of its remaining useful life. Additional consideration of historical emissions data and permit conditions, which Wyoming expects to remain the same, led the State to ultimately determine that no additional controls are necessary for Unit 4 in the second planning period.

e. Genesis Alkali—Westvaco⁸¹

Genesis Alkali’s Westvaco facility is a trona ore⁸² mine and soda ash production plant located in Sweetwater County, Wyoming. Westvaco has two existing subbituminous coal-fired boilers, Unit NS–1A and Unit NS–1B, with each having a design heat input rate of 887 MMBtu/hr. The facility also has two mono calciners (MONO5 and NS3) and one lime kiln (SM–1) that, combined with the two boilers, have emissions of NO_x, SO₂, and PM totaling at least 100 tons/year. Emissions from Westvaco may affect the visibility in 19 Class I areas in Colorado, Idaho, Montana, Utah, and Wyoming (table 32).

Table 11 describes the installed NO_x, SO₂, and PM emissions controls at Westvaco.

⁸¹This facility is addressed at pages 145–55 and appendix E of the Wyoming 2022 SIP submission.

⁸²Trona is a mineral found in large deposits in Wyoming and elsewhere. It is a common source of sodium carbonate (soda ash).

TABLE 11—INSTALLED NO_x, SO₂, AND PM EMISSIONS CONTROLS AT WESTVACO

Unit	SO ₂ controls	NO _x controls	PM controls
NS-1A (coal-fired boiler)	Wet scrubber	LNB/OFA	ESP.
NS-1B (coal-fired boiler)	Wet scrubber	LNB/OFA	ESP.
NS3 (gas-fired calciner)		Good combustion ¹	ESP.
MONO5 (gas-fired calciner)		Good combustion ¹	Wet scrubber.
SM-1 (gas-fired kiln)		Good combustion ¹	Wet scrubber.

¹ Wyoming used the term “good combustion practices” to describe existing efforts to control NO_x emissions from these units. Although not specified by the State, good combustion practices may include, but are not limited to, proper burner maintenance, proper burner alignment, proper fuel to air distribution and mixing, routine inspection, and preventive maintenance.

The State conducted a four-factor analysis for several units at Westvaco, relying on information submitted by the facility (attached as appendix E to the Wyoming 2022 SIP submission). In its evaluation of further NO_x emissions controls, the State considered SNCR and

SCR for the two coal-fired boilers and LNB for the gas-fired calciners and lime kiln (table 12). Trona injection prior to ESP was evaluated for further SO₂ emissions control on the coal-fired boilers; no further SO₂ emissions controls were evaluated for the gas-fired

calciners and lime kiln (table 13). For further PM emissions control, the State evaluated FF and wet ESP on the two coal-fired boilers, wet ESP on one of the calciners (NS3), and ESP and wet ESP on the other calciner (MONO5) and lime kiln (table 14).

TABLE 12—SUMMARY OF WESTVACO NO_x COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
NS-1A (coal-fired boiler)	SNCR/SCR	397/893	\$3,079,590/\$5,395,079	\$7,757/\$6,039
NS-1B (coal-fired boiler)	SNCR/SCR	414/933	3,014,532/5,379,506	7,273/5,769
NS3 (gas-fired calciner)	LNB	36.6	530,569	14,490
MONO5 (gas-fired calciner)	LNB	28.3	395,507	14,000
SM-1 (gas-fired kiln)	LNB	44.1	323,875	7,339

TABLE 13—SUMMARY OF WESTVACO SO₂ COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
NS-1A (coal-fired boiler)	Trona injection prior to ESP	205.6	\$2,674,635	\$13,007
NS-1B (coal-fired boiler)	Trona injection prior to ESP	201.9	2,674,634	13,249

TABLE 14—SUMMARY OF WESTVACO PM COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
NS-1A (coal-fired boiler)	Fabric filter/Wet ESP	¹ 242.2/242.2	\$3,466,804/\$3,064,278	\$14,314/\$12,652
NS-1B (coal-fired boiler)	Fabric filter/Wet ESP	¹ 33.4/33.4	3,445,297/3,026,284	103,079/90,542
NS3 (gas-fired calciner)	Wet ESP	267.2	2,196,068	8,219
MONO5 (gas-fired calciner)	ESP/Wet ESP	145/145	1,203,249/1,330,528	8,296/9,174
SM-1 (gas-fired kiln)	ESP/Wet ESP	15.7/15.7	911,823/1,114,931	58,004/70,924

¹ The PM emissions reductions for NS-1A and NS-1B do not match due to a difference in the 2014 stack test data and heat input.

The State estimated the time necessary to achieve compliance using the controls it evaluated to be at least four years.

The State identified several energy and non-air environmental impacts associated with potential controls at Westvaco. For installation and operation of SNCR on the coal-fired boilers, the State noted storage of additional reagent chemicals onsite, ammonia slip, generation and disposal of wastewater, and generation of emissions due to additional fuel combustion to overcome

the energy penalty associated with SNCR. For installation and operation of SCR on the coal-fired boilers, the State identified impacts related to the transport, handling, and use of aqueous ammonia, replacement and disposal of spent catalyst, and adverse air impacts due to ammonia slip; possible formation of a visible plume; oxidation of carbon monoxide to carbon dioxide; and oxidation of SO₂ to sulfur trioxide, with subsequent formation of sulfuric acid mist due to ambient or stack moisture. The State observed that running a wet

ESP would require additional electricity and would lead to the generation and disposal of solid waste and wastewater, while replacement of the ESP with a FF would require additional electricity and disposal of the filter bags as waste upon replacement.

The State considered the remaining useful life of the emission units at Westvaco to be 20 years or more.

Finally, Wyoming described the Westvaco permitted NO_x, SO₂, and PM

emissions limits⁸³ for the boilers, calciners, and lime kiln in addition to emissions trends for these units over five years (2016–2020). For the boilers, the figures show consistent declines in NO_x emissions (from approximately 900 tons/year to approximately 600 tons/year), SO₂ emissions (from approximately 1,300 tons/year to approximately 550 tons/year), and PM emissions (from approximately 100 tons/year to almost 0 tons/year). For the calciners, NO_x emissions remained constant (50–100 tons/year) and PM emissions slightly declined (from approximately 230 tons/year to 220 tons/year). PM emissions for the lime kiln remained consistent (approximately 20 tons/year), while NO_x emissions

increased slightly (from approximately 50 tons/year to approximately 75 tons/year). The State notes that permit conditions were renewed in 2021 and it does not expect emissions at Westvaco to increase before the third planning period.

After considering the four factors, historical emissions data, and current control technologies, Wyoming determined that no additional controls are necessary at Westvaco in the second planning period for regional haze. The State concluded that further controls will be evaluated in the third planning period.

f. Mountain Cement Company—Laramie Portland Cement⁸⁴

Mountain Cement Company’s Laramie Portland Cement plant is located in Laramie, Wyoming and consists of one long-dry process kiln (Kiln 1) and one long-dry 2-stage preheater kiln (Kiln 2). Together, the kilns are permitted to produce 900,000 tons of cement annually, with Kilns 1 and 2 capable of producing 254,000 tons/year of clinker and 547,500 tons/year of clinker, respectively. Emissions from Laramie Portland Cement may affect the visibility in five Class I areas in Colorado (table 32).

Table 15 describes the installed NO_x, SO₂, and PM emissions controls at Laramie Portland Cement.

TABLE 15—INSTALLED NO_x, SO₂, AND PM EMISSIONS CONTROLS AT LARAMIE PORTLAND CEMENT

Unit	SO ₂ controls	NO _x controls	PM controls
Kiln 1	Inherent dry scrubbing	Good combustion practice	Baghouse.
Kiln 2	Inherent dry scrubbing	Good combustion practice/2-stage preheater.	Baghouse.

Wyoming did not evaluate further SO₂ or PM emissions controls based on historical decreasing emissions trends, PM emissions limits for both kilns based on CAA maximum achievable control

technology (MACT) standards, and the use of dust collectors/baghouses that constitute BACT for PM at all point sources at the facility.⁸⁵

Relying on an evaluation submitted by the facility (attached as appendix L

to the Wyoming 2022 SIP submission), the State conducted a four-factor analysis for NO_x emissions control and evaluated SNCR as a technically feasible option (table 16).

TABLE 16—SUMMARY OF LARAMIE PORTLAND CEMENT PLANT KILNS 1–2 * NO_x COST ANALYSIS ASSOCIATED WITH SNCR

Level of control (% emissions reductions)	Total capital investment (\$)	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
10	\$5,833,000	933	\$17,639,442	\$18,900
15		1,005.6		17,540
20		1,077.9		16,360
25		1,150.2		15,340

* Figures are for both kilns combined.

The State estimated the time necessary to achieve compliance using SNCR to be a minimum of 18 months for design, procurement, build, and installation, plus an additional 12 months for staging the installation process across both kilns.

The State identified the following energy and non-air environmental impacts associated with the installation and operation of SNCR: increased electrical energy to operate the SNCR system; possible byproducts from unreacted ammonia, including

ammonium sulfate, ammonium bisulfite, and ammonium chloride; and ammonia slip, which can reduce visibility. In addition, the State noted that ammonia and salt absorption into the cement kiln dust (a byproduct) could also make the cement kiln dust unsellable, resulting in an economic penalty.

The State estimated the remaining useful life of Kilns 1 and 2 to be longer than the projected lifetime of the pollution control technology (SNCR) of

20 years, which is the capital cost recovery period of the controls.⁸⁶

The State noted that NO_x emissions at Kilns 1 and 2 consistently decreased between 2016 and 2020 and that permitted emissions are not expected to change. It also pointed out that Kiln 2 NO_x emissions, in particular, have consistently fallen under the allowable emission limit. Based on consideration of the four factors, historical emissions data, and current control technologies, Wyoming determined that no additional controls at Laramie Portland Cement are

⁸³ Wyoming Permit Number 3–1–132. The Wyoming 2022 SIP submission at 151 appears to erroneously refer to this permit as Wyoming Permit Number 3–2–132.

⁸⁴ This facility is addressed at pages 156–60 and appendix L of the Wyoming 2022 SIP submission.

⁸⁵ Wyoming 2022 SIP submission, appendix L.

⁸⁶ According to Laramie Portland Cement’s cost analyses found in appendix L of Wyoming’s 2022 SIP submission, the facility used an amortization period of 10 years to evaluate SNCR on Kilns 1 and 2.

necessary to make reasonable progress in the regional haze second implementation period. It stated that further controls will be evaluated in the third implementation period.

g. PacifiCorp—Wyodak Power Plant ⁸⁷

PacifiCorp’s Wyodak Power Plant (Wyodak) is located in Campbell County, Wyoming and includes one coal-fired boiler burning sub-bituminous coal, with a net generating capacity of 335 MW. Emissions from Wyodak may affect the visibility in 11 Class I areas in Colorado, North Dakota, South Dakota, and Wyoming (table 32).

Neither the State nor PacifiCorp conducted a four-factor analysis for Wyodak. In response to the State’s initial request to submit a four-factor analysis,⁸⁸ PacifiCorp explained that it was participating in ongoing confidential settlement discussions regarding the first planning period requirements for Wyodak, which it

argued will influence whether and how a four-factor analysis will be completed. PacifiCorp requested that the State delay submittal of a second planning period analysis until after settlement discussions concluded. Wyoming referred to ongoing litigation as the reason not to evaluate this source and stated that a four-factor analysis will occur in a future implementation period, if needed.

h. TATA Chemicals—Green River Works ⁸⁹

TATA Chemicals’ Green River Works facility is a trona ore mine and soda ash production plant located in Sweetwater County, Wyoming. Green River Works has two existing subbituminous coal-fired stoker boilers, C Boiler and D Boiler, with a firing rate of 534 MMBtu/hour and 880 MMBtu/hour, respectively. In addition, Green River Works has seven natural gas-fired calciners: five smaller calciners rated at

65 tons of soda ash/hour (50 MMBtu/hour) and two larger calciners, Calciner 1 and Calciner 2, rated at 145 tons of soda ash/hour (200 MMBtu/hour). Relying on information submitted by the facility (attached as appendix G to Wyoming’s 2022 SIP submission), the State conducted a four-factor analysis for the two coal-fired boilers and the two large natural gas-fired calciners, as these units have annual actual emissions of visibility-impairing pollutants in excess of 100 tons/year. The State asserts that the remaining emission units at Green River Works are small and contribute a fraction of the facility’s visibility-impairing emissions; no four-factor analysis was performed for those units. Emissions from Green River Works may affect the visibility in 19 Class I areas in Wyoming (table 32).

Table 17 describes the installed NO_x, SO₂, and PM emissions controls at Green River Works.

TABLE 17—INSTALLED NO_x, SO₂, AND PM EMISSIONS CONTROLS AT GREEN RIVER WORKS

Unit	NO _x controls	SO ₂ controls	PM controls
C Boiler	LNB + OFA	DSI	ESPs.
D Boiler	LNB + OFA	DSI	ESPs.
Calciner 1	ESPs.
Calciner 2	ESPs.

In its evaluation of further NO_x emissions controls, the State evaluated SNCR and SCR on the two coal-fired boilers and LNB and SCR on the two

calciners (table 18). It evaluated wet and dry flue gas desulfurization (FGD) for further SO₂ emissions control on the coal-fired boilers (table 19). The State

evaluated wet and dry ESP for further PM emissions control on the two calciners (table 20).

TABLE 18—SUMMARY OF GREEN RIVER WORKS NO_x COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year) ¹	Average cost effectiveness ¹ (\$/ton)
C Boiler	SNCR/SCR	98/295	\$885,174/\$3,701,998	\$9,000/\$12,547
D Boiler	SNCR/SCR	150/449	\$1,195,034/\$5,525,216	\$7,992/\$12,317
Calciner 1	LNB/SCR	48.3/56.4	\$269,500/\$548,100	\$5,580/\$9,720
Calciner 2	LNB/SCR	28.9/38.3	\$269,500/\$540,900	\$9,310/\$14,140

¹ The total annual cost and average cost effectiveness figures for the C and D Boilers in Wyoming’s 2022 SIP submission on page 164 conflict with the figures presented in appendix G (pages G–36 and G–57, among others). The figures from page 164 are presented in table 18.

TABLE 19—SUMMARY OF GREEN RIVER WORKS SO₂ COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
C Boiler	Dry FGD/Wet FGD	855.3/894.4	\$5,407,000/\$6,092,600	\$6,320/\$6,810
D Boiler	Dry FGD/Wet FGD	1,392.0/1,456.7	\$8,889,200/\$10,023,100	\$6,390/\$6,880

⁸⁷ This facility is addressed at page 160 and appendix C of the Wyoming 2022 SIP submission.

⁸⁸ Wyoming 2022 SIP submission, appendix C.

⁸⁹ This facility is addressed at pages 161–67 and appendix G of the Wyoming 2022 SIP submission.

TABLE 20—SUMMARY OF GREEN RIVER WORKS PM COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
Calciner 1	Wet ESP/Dry ESP	67.8/57.9	\$1,202,900/\$976,900	\$17,700/\$16,900
Calciner 2	Wet ESP/Dry ESP	69.3/67.7	\$1,202,900/\$976,900	\$17,400/\$14,400

For the two boilers, the State estimated the time necessary to achieve compliance using SCR to be 28 months and using SNCR to be 24 months. For the two calciners, the State estimated that installation of LNB or SCR would take 28 months, and installation of wet or dry ESP would take 18 months. It estimated the time needed to install wet and dry FGD on the two boilers to be 36 months. These timelines do not include time associated with regulation development or SIP approval.

The State identified several energy and non-air environmental impacts associated with the installation and operation of controls at Green River Works. For SCR or SNCR, the State noted the storage of additional reagent chemicals onsite, ammonia slip, increased electric power requirements, and formation of ammonium salt, which may result in additional fine particulate matter emissions. As to wet or dry FGD, the State identified steam output capacity penalty or reduction of more than 1%, along with a boiler efficiency impact of approximately 1.5%, combined with additional electricity and water demand and liquid and solid waste disposal requirements. In addition, the State asserted that dry FGD systems (for SO₂ control) may increase PM emissions from the boiler, while the operation of a wet FGD system, and

potentially a dry FGD system, would result in visibility impacts by causing a visible plume from the stack.

In considering remaining useful life, the State explained that both the emission units and the new equipment are expected to last 20 years or more.

Finally, Wyoming provided the emission trends for the C and D Boilers over five years (2016–2020).⁹⁰ The figures show that C Boiler NO_x emissions remained steady (at approximately 400 tons/year), while SO₂ emissions consistently declined (from approximately 1,800 tons/year to approximately 700 tons/year). For the D Boiler, NO_x emissions also remained steady (at approximately 600 tons/year), while SO₂ emissions consistently declined (from approximately 3,500 tons/year to approximately 1,000 tons/year). Wyoming stated that NO_x and SO₂ emissions from the C and D Boilers are not expected to significantly increase between 2020 and the third planning period.

Ultimately, based on its consideration of the four factors, historical emissions data, and current control technologies, Wyoming determined that no additional controls are necessary at Green River Works in the second planning period for regional haze. The State concluded that further controls will be evaluated in the third planning period.

i. Contango Resources, Inc.—Elk Basin Gas Plant⁹¹

Contango Resources, Inc.’s Elk Basin Gas Plant in Park County, Wyoming is a sour natural gas processing and liquids extraction plant designed to process 10 million standard cubic feet per day of sour gas into propane, butane, natural gas, gasoline, and elemental sulfur. The Elk Basin Gas Plant has nine natural gas-fired compressor engines and a natural gas-fired incinerator, with each having a design heat input rate of 358.5 MMBtu/hour. Emissions from the Elk Basin Gas Plant may affect the visibility in two Class I areas in Wyoming (table 32).

Relying on information submitted by the facility (attached as appendix H to the Wyoming 2022 SIP submission), the State evaluated low emission combustion (LEC) for further NO_x emissions control on the nine compressor engines (table 21). For further SO₂ emissions control on the incinerator, it evaluated one option of optimization of the existing 2-stage Claus Plant, and another option of adding a third stage to the Claus Plant and adding a tail gas treating unit (table 22). The State did not evaluate further PM emissions controls on any units.

TABLE 21—SUMMARY OF ELK BASIN GAS PLANT NO_x COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Average cost effectiveness (\$/ton)
Nine (9) compressor engines (EC1–EC9)	LEC	1,793.55	\$1,500–\$2,200

TABLE 22—SUMMARY OF ELK BASIN GAS PLANT SO₂ COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Average cost effectiveness (\$/ton)
Incinerator (INC–1)	Optimizing 2-stage Claus Plant	50	\$24,000
	Adding a 3rd stage to the Claus Plant and a tail gas treating unit	80	200,000

The State estimated the time necessary to achieve compliance using LEC NO_x emissions controls on the nine

compressor engines to be three to five years after the SIP is approved. For SO₂ control on the incinerator, it estimated

that optimizing the 2-stage Claus Plant would take two to five years, while adding a third stage to the Claus Plant

⁹⁰ Wyoming 2022 SIP submission at 166–67.

⁹¹ This facility is addressed at pages 168–72 and appendix H of the Wyoming 2022 SIP submission.

together with adding a tail gas treating unit would take three to five years after the SIP is approved.

The State identified the following energy and non-air environmental impacts associated with the installation and operation of LEC controls on the nine compressor engines: an annual electricity cost increase of approximately \$11,500 per 1,200 horsepower engine and a potential decrease in PM emissions due to more ideal combustion. Likewise, the State expected that optimizing the 2-stage Claus Plant and adding a third stage to the Claus Plant would both result in increased use of electricity due to added instrumentation. It noted that the amount of sulphur catalyst requiring landfill disposal is expected to decrease with the optimization of the existing 2-stage Claus Plant, while adding a third stage to the Claus Plant is expected to increase sulphur catalyst disposal needs.

In evaluating remaining useful life, Wyoming stated that the LEC control units are expected to last 20 to 25 years.

Both control options for the tail gas incinerator are expected to last 30 years.

The State also provided the permitted SO₂ emissions limits for the incinerator⁹² and emissions trends for both the incinerator and nine compressor engines over five years (2016–2020). The figures show that the incinerator’s SO₂ emissions consistently dropped (from approximately 500 tons/year to approximately 350 tons/year) and are below the permitted limit of 3,044.1 tons/year. According to the State, the SO₂ emissions from the incinerator are expected to continue to decrease. The figures show consistent declines in NO_x emissions between 2016–2020 for all compressor engines except EC8, which showed a slight increase. Overall, Wyoming concluded that NO_x and SO₂ emissions at the Elk Basin Gas Plant have consistently declined and are not expected to change in a way that significantly increases emissions.

Ultimately, after considering the four factors, emissions trends, and permit conditions, Wyoming determined that the Elk Basin Gas Plant may warrant

further analysis of emission controls. The State remarked that it would submit more detailed analyses in the regional haze progress report due January 31, 2025, to determine if any new controls are reasonable for this facility and should be scheduled for implementation.

j. Genesis Alkali—Granger Soda Ash Facility⁹³

Genesis Alkali’s Granger Soda Ash facility (Granger) is a trona ore mine and soda ash production plant located in Sweetwater County, Wyoming. Granger has two existing subbituminous coal-fired stoker boilers, Unit UIN–14 and Unit UIN–15, with each having a design heat input rate of 358.5 MMBtu/hour. The remaining emission units at Granger reported 2014 actual emissions of less than 5 tons/year each of SO₂, NO_x, and PM₁₀. Emissions from Granger may affect the visibility in two Class I areas in Wyoming (table 32).

Table 23 describes the installed NO_x, SO₂, and PM emissions controls at Granger.

TABLE 23—INSTALLED NO_x, SO₂, AND PM EMISSIONS CONTROLS AT GRANGER

Unit	SO ₂ controls	NO _x controls	PM controls
UIN–14 (coal-fired boiler)	Wet scrubber	OFA	ESP.
UIN–15 (coal-fired boiler)	Wet scrubber	OFA	ESP.

Relying on information submitted by the facility (attached as appendix I to the Wyoming 2022 SIP submission), the State conducted a four-factor analysis

for further emissions controls on the two coal-fired boilers. It evaluated SNCR and SCR for further NO_x control (table 24), trona injection prior to ESP

for further SO₂ control (table 25), and wet ESP and FF for further PM control (table 26).

TABLE 24—SUMMARY OF GRANGER NO_x COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
UIN–14 (coal-fired boiler)	SNCR/SCR	271/610	\$1,450,702/\$3,175,904	\$5,347/\$5,202
UIN–15 (coal-fired boiler)	SNCR/SCR	233/524	1,422,667/3,175,825	6,111/6,063

TABLE 25—SUMMARY OF GRANGER SO₂ COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
UIN–14 (coal-fired boiler)	Trona injection prior to ESP	104.5	\$2,745,234	\$26,283
UIN–15 (coal-fired boiler)	Trona injection prior to ESP	70.4	2,745,202	38,994

⁹² Wyoming Permit Number 0022339.

⁹³ This facility is addressed at pages 172–77 and appendix I of the Wyoming 2022 SIP submission.

TABLE 26—SUMMARY OF GRANGER PM COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
UIN-14 (coal-fired boiler)	Wet ESP/FF	8.9/8.9	\$1,765,111/\$1,945,510	\$198,774/\$219,089
UIN-15 (coal-fired boiler)	Wet ESP/FF	120/120	1,732,090/1,933,758	14,434/16,115

The State estimated the time necessary to achieve compliance to be at least four years. The State also identified several energy and non-air environmental impacts associated with the installation and operation of the controls it evaluated. For SNCR, it noted the storage of additional reagent chemicals onsite, ammonia slip, generation and disposal of wastewater, and generation of further emissions due to additional fuel combustion to overcome the energy penalty associated with SNCR. As to SCR, the State identified the transport, handling, and use of aqueous ammonia; replacement and disposal of spent catalyst; and adverse air impacts due to ammonia slip, possible formation of a visible plume, oxidation of carbon monoxide to carbon dioxide, and oxidation of SO₂ to sulfur trioxide with subsequent formation of sulfuric acid mist due to ambient or stack moisture. The State remarked that additional electricity would be needed for operation of a wet ESP, which would also require generation and disposal of solid waste and wastewater. Replacement of the ESP with a FF would require additional electricity and disposal of the filter bags as waste upon replacement, while trona injection prior to electrostatic precipitation would generate solid waste and require additional electricity. For remaining useful life, the State estimated that the emission units are expected to last 20 years or more.

Finally, Wyoming noted that Granger has shut down several sources since 2014 and has made voluntary emissions reductions as part of the Granger Optimization Project. That project triggered prevention of significant deterioration (PSD) review for NO_x, SO₂, and PM₁₀ emissions and included an evaluation of the facility's emissions impacts at nearby Class I areas, which the State found to be acceptable.

The State also provided the permitted NO_x, SO₂, and PM emission limits⁹⁴ and emissions trends for the boilers over five years (2016–2020). The figures show that boiler UIN-14 NO_x emissions dropped (from approximately 630 tons/year to approximately 120 tons/year), as did SO₂ emissions (from approximately 180 tons/year to approximately 20 tons/year) and PM emissions (from approximately 95 tons/year to approximately 10 tons/year). Emissions also declined for boiler UIN-15 for NO_x (from approximately 675 tons/year to approximately 150 tons/year), SO₂ (from approximately 150 tons/year to approximately 10 tons/year), and PM (from approximately 40 tons/year to approximately 10 tons/year). Wyoming concluded that NO_x, SO₂, and PM emissions at both boilers decreased or remained consistent between 2016 and 2020, remained under their permitted emission limits, and are not expected to change for the next permit renewal.

Ultimately, Wyoming determined, based on the four factors, emissions trends, and permit conditions, that no

additional controls are necessary at Granger to make reasonable progress in the second planning period for regional haze. The State concluded that further controls will be evaluated in the third planning period.

k. Burlington Resources—Lost Cabin Gas Plant⁹⁵

Burlington Resources' Lost Cabin Gas Plant is a natural gas sweetening plant located in Fremont County, Wyoming. The plant has two natural gas processing trains, Trains 2 and 3; each processing train consists of a solvent absorption section to separate carbon dioxide (CO₂), hydrogen sulfide (H₂S), and carbonyl sulfide (COS) from the natural gas.⁹⁶ Emissions from the Lost Cabin Gas Plant may affect the visibility in three Class I areas in Wyoming (table 32).

Relying on information submitted by the facility (attached as appendix J to the Wyoming 2022 SIP submission), the State evaluated wet scrubbers for SO₂ emissions control on Trains 2 and 3 (table 27).⁹⁷ It noted that the Lost Cabin Gas Plant is currently controlling SO₂ emissions by continued emphasis on minimization of flaring events through the combination of operational controls, equipment upgrades, and facility design changes.⁹⁸ Wyoming did not conduct a four-factor analysis for NO_x and PM emissions control measures, reasoning that NO_x and PM account for a small fraction of total emissions from the facility.⁹⁹

TABLE 27—SUMMARY OF LOST CABIN GAS PLANT SO₂ COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year) ¹	Average cost effectiveness (\$/ton) ²
Train 2	Wet Scrubber	174.9	\$1,442,233	\$7,710

⁹⁴ Wyoming Permit Number 0021849. Emission limits for each boiler, UIN-14 and UIN-15, are 985.5 tons/year for NO_x, 284.7 tons/year for SO₂, and 118.3 tons/year for PM.

⁹⁵ This facility is addressed at pages 178–82 and appendix J of the Wyoming 2022 SIP submission.

⁹⁶ Train 1 was decommissioned and decoupled from Train 2. Wyoming 2022 SIP submission at 178.

⁹⁷ Flaring emissions were not included in the SO₂ control analysis because SO₂ emissions from flaring are already well controlled, according to the State, and decreased from 2,289 tons/year to 1,075 tons/year between 2014 and 2018.

⁹⁸ Significant changes to the facility design were implemented to reduce flaring and SO₂ emissions, including addition of a sulfur tank vapor thermal oxidized in 2017, improved tail gas unit cooling on Train 2, addition of a flare H₂S analyzer on Train

2 (Train 3 pending) to troubleshoot potential sour vent and drain valve leaks, and addition of fuel gas assist and improved programming logic for sour flare events on both Trains 2 and 3. Wyoming 2022 SIP submission at 178–79.

⁹⁹ According to Wyoming, total NO_x and PM₁₀ emissions for the Lost Cabin Gas Plant are 124.9 tons/year and 12.0 tons/year, respectively. Wyoming 2022 SIP submission at 178.

TABLE 27—SUMMARY OF LOST CABIN GAS PLANT SO₂ COST ANALYSIS—Continued

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year) ¹	Average cost effectiveness (\$/ton) ²
Train 3	Wet Scrubber	304.2	2,438,411	7,470

¹ Cost figures reflect those on page 179 and appendix J of the Wyoming 2022 SIP submission. The cost figures found in table 11–34 on page 180 of the Wyoming 2022 SIP submission (\$1,348,694 for Train 2 and \$2,272,044 for Train 3) conflict with these. These conflicting numbers are addressed in section IV.C.2.b.ii. of this document.

² Cost figures reflect those on page 180 of the Wyoming 2022 SIP submission, which conflict with the cost figures found in appendix J (\$8,250 for Train 2 and \$8,010 for Train 3). These conflicting numbers are addressed in section IV.C.2.b.ii. of this document.

The State estimated the time necessary to achieve compliance using wet scrubbers to be 30 months, but potentially up to 42 months.

The State identified the following energy and non-air environmental impacts associated with the installation and operation of wet scrubbers on Trains 2 and 3: an energy penalty from operation of the scrubber systems; significant water usage; disposal of salt-laden spent scrubber liquor; and the possibility of highly visible secondary particulate formation.

The State estimated the remaining useful life of the wet scrubbers to be 15 years. Additionally, Wyoming noted that actual SO₂ emissions (269 tons/year from Train 2 and 338.05 tons/year from Train 3 in 2020) have consistently remained under allowable emission limits (503.7 tons/year for Train 2 and 1,366.6 tons/year for Train 3). The State also provided SO₂ emissions trends for Trains 2 and 3 over five years (2016–2020). The figures show that SO₂ emissions from Train 2 consistently increased (from approximately 125 tons/year to approximately 275 tons/year), while SO₂ emissions from Train 3 trended upward between 2016 and the

end of 2018 (from approximately 280 tons/year to approximately 340 tons/year) before dropping to 0 tons/year in 2019 and 2020.¹⁰⁰ The State also noted an overall reduction in actual SO₂ emissions from 2014 to 2018 of 1,553.6 tons/year (which represents total SO₂ actual emissions, including those from flaring), as well as a permitted allowable SO₂ emission reduction of 389.6 tons/year.

Wyoming concluded that installing wet scrubbers for SO₂ emissions control on Trains 2 and 3, at a cost of over \$7,000/ton removed, is cost prohibitive. In addition, the State noted that it expects total SO₂ emissions to decrease year-over-year as production continues to decline at an approximate rate of 4 to 5 percent, with overall SO₂ emissions declining at 3 to 5 percent per year during normal operation.

Ultimately, Wyoming determined, after consideration of the four factors and emissions trends, not to propose any changes to current SO₂ emissions controls at the Lost Cabin Gas Plant. The State concluded that further controls will be evaluated in the third planning period.

l. Dyno Nobel Inc.—Cheyenne Fertilizer Facility¹⁰¹

Dyno Nobel Inc.’s Cheyenne Fertilizer Facility is a chemical manufacturing plant located in Cheyenne, Wyoming that produces ammonia, nitric acid, urea/diesel exhaust fluid, carbon dioxide, low density ammonium nitrate, and other related products. Relying on information submitted by the facility (attached as appendix K to the Wyoming 2022 SIP submission), the State conducted a four-factor analysis for several emission units: two natural gas-fired Cooper reciprocating compressor engines (ENG004 and ENG005), a natural gas-fired primary reformer (CKD001), and three cooling towers (CTW001, CTW002, CTW003). Together, these units account for 88.6% of the total NO_x, SO₂, and PM₁₀ emissions from the facility. Emissions from the Cheyenne Fertilizer Facility may affect the visibility in two Class I areas in Colorado (table 32).

Table 28 describes the installed NO_x, SO₂, and PM emissions controls at the Cheyenne Fertilizer Facility.

TABLE 28—INSTALLED NO_x, SO₂, AND PM EMISSIONS CONTROLS AT THE CHEYENNE FERTILIZER FACILITY

Unit	SO ₂ controls ¹	NO _x controls	PM controls
ENG004 (engine)	Lean burn combustion.	Legacy mist eliminator. Mist eliminator. ² Legacy mist eliminator.
ENG005 (engine)	Lean burn combustion.	
CKD001 (reformer)	LNB.	
CTW001 (cooling tower)	
CTW002 (cooling tower)	
CTW003 (cooling tower)

¹ All emission units are natural gas-fired.
² Designed for 0.001% drift.

For further NO_x emissions control, the State evaluated LEC and SCR on the two engines and SCR on the reformer (table 29). The State evaluated upgraded

mist eliminators for further PM emissions control on two of the cooling towers (CTW001 and CTW003) (table 30). No additional SO₂ controls were

evaluated for any of the natural gas-fired units.

¹⁰⁰ According to the State, in December 2018, Train 3 had a backfire and was not operating in 2019 and 2020. Train 3 was rebuilt and restarted in

early 2021; the State expects consistent emissions trends following the rebuild. Wyoming 2022 SIP submission at 181.

¹⁰¹ This facility is addressed at pages 182–91 and appendix K of the Wyoming 2022 SIP submission.

TABLE 29—SUMMARY OF THE CHEYENNE FERTILIZER FACILITY NO_x COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
ENG004, ENG005 (engines)	LEC	229/engine	\$244,100/engine	\$1,067/engine
	SCR	78 ¹	418,700	5,354.
CKD001 (reformer)	SCR	34	716,300	21,030.

¹ Emission reductions beyond LEC.

TABLE 30—SUMMARY OF CHEYENNE FERTILIZER FACILITY PM COST ANALYSIS

Unit	Control technology	Emission reduction (tons/year)	Total annual cost (\$/year)	Average cost effectiveness (\$/ton)
CTW001 (cooling tower)	Upgraded mist eliminators	15.5	\$16,300	\$1,056
CTW003 (cooling tower)	Upgraded mist eliminators	2.4	5,740	2,368

The State estimated the time necessary to achieve compliance using LEC retrofits on the engines to be one year. However, the State asserted that the retrofits need to be completed during the next scheduled turnarounds, which are four years apart for each engine and are scheduled for 2026 and 2030. The State estimated the time necessary to achieve compliance using SCR to be one to two years but noted it would require a total shutdown that could not occur until 2030 or later. The State estimated the time necessary to achieve compliance using the mist eliminator upgrades on the cooling towers to be one to five years for CTW001 and six or more years for CTW003 because the upgrades must occur during a scheduled turnaround/shutdown.

The State identified several energy and non-air environmental impacts associated with the installation and operation of potential controls. For SCR on the engines and reformer, the State noted the need to retrofit both the engines and reformer into the existing structures using extensive ductwork, which may lead to a pressure drop corresponding to a slight decrease in efficiency. Wyoming asserted this could result in greater fuel and energy consumption as well as upsets due to backpressure effects, which could lead to forced shutdowns, safety incidents/injuries, excess emissions, and wasted product. The LEC retrofit on the engines would require a modest increase to heat load, while the mist eliminator upgrades for the cooling towers were not expected to result in any significant energy and non-air quality environmental impacts. In its evaluation of remaining useful life, the State estimated 25 years for SCR and LEC and 30 years for the mist eliminator upgrades.

Wyoming also provided the Cheyenne Fertilizer Facility permitted NO_x emission limits¹⁰² for the engines and reformer, in addition to NO_x emissions trends for these units over five years (2016–2020). NO_x emissions for the engines initially declined (from approximately 1,500 tons/year in 2016 to approximately 500 tons/year in 2019) before increasing in 2020 (to approximately 1,500 tons/year). According to the State, a stack test performed in April 2021 indicated that NO_x emissions from the engines were 700 tons/year, representing a decrease of over 50% in emissions from the 2016–2020 time frame.¹⁰³ In addition, the average NO_x emission rate for both engines was 46.9 lb/hour in 2021, below their allowable emission rate of 170.61 lb/hour, which has remained the same since 2012 and the State asserts is unlikely to change when a new permit is issued. The NO_x emissions trends for the reformer over five years (2016–2020) indicate a decline from approximately 120 tons/year in 2016 to approximately 35 tons/year in 2020. In addition, the average NO_x emission rates for the reformer between 2016–2020 varied between 4–10 lb/hour, below the permitted limit of 28.2 lb/hour, which has also remained the same since 2012 and the State believes is unlikely to change when a new permit is issued. The State also provided PM emissions trends for all three cooling towers (CTW001, CTW002, and CTW003) over five years (2016–2020), which show a decline in PM emissions (from approximately 400 tons/year to

approximately 25 tons/year across all three cooling towers combined).

Wyoming concluded that, given emissions trends and allowable vs. actual emission rates, there is no evidence that NO_x emissions from the engines and reformer will increase or that changes to the allowable emissions will be necessary, as NO_x emissions are expected to remain consistent or decrease between 2020 and 2028. The State also determined that the total capital investment required to install mist eliminators on CTW001 and CTW003 is not justified given what it considered to be a “minute” amount of potential PM emissions reductions.

Overall, after considering the four factors and emissions trends, Wyoming determined that no additional emission controls are necessary at the Cheyenne Fertilizer Facility to make reasonable progress in the second planning period for regional haze. At the same time, the State also concluded that this facility may warrant further analysis of emission controls to reach reasonable progress, which it stated would be detailed in the progress report due January 31, 2025.

m. Summary of Wyoming’s Reasons for Concluding That No Additional Emission Reduction Measures Are Necessary To Make Reasonable Progress

After evaluating the twelve sources it had selected for consideration of additional controls, Wyoming concluded that no new controls on those sources are warranted during the regional haze second planning period.¹⁰⁴ Chapter 13 of Wyoming’s 2022 SIP submission summarizes the State’s reasons for not requiring any additional emission reduction measures

¹⁰² Wyoming Title V Permit Number 0022581.

¹⁰³ According to the State, the emissions measurement methodology was consistent between 2016–2020 but changed to an alternate, more accurate stack test methodology in 2021. Wyoming 2022 SIP submission at 188.

¹⁰⁴ Wyoming 2022 SIP submission at 206.

to make reasonable progress toward the national visibility goal.

First, the State explained how it considered costs of compliance. Wyoming did not rely on a cost-effectiveness threshold to determine whether additional emission reduction measures are reasonable. It asserted that the cost of additional controls could harm the State's economy and the livelihoods of Wyoming's rural communities, particularly because coal-fired units and oil and gas development tend to operate in rural areas that depend on those activities for economic support. The State remarked that any additional costs could cause economic stress to energy producers that are operating in an uncertain financial climate, potentially forcing those sources out of the market prematurely. It also pointed to potential detrimental effects on grid stability and on Wyoming and out-of-state ratepayers.

Second, Wyoming highlighted historical and anticipated reductions in emissions from first implementation period measures, increasing renewable energy generation, facility shutdowns and conversions, and measures taken in other states and nationwide. It described emission reductions at Wyoming facilities since 2014, noting that NO_x emissions declined by almost 17,400 tons, SO₂ emissions declined by approximately 18,000 tons, and PM₁₀ emissions declined by almost 850 tons. Wyoming expects further reductions to occur between 2020 and 2028, which it asserted will benefit all Class I areas. It pointed to expected facility retirements at Dave Johnston Units 1 and 2, which Wyoming stated has an enforceable consent decree requirement to cease coal operations by 2028; Dave Johnston Unit 3, which has an enforceable state and federal commitment to close by the end of 2027; and Naughton Units 1 and 2, which Wyoming stated are planned to retire by the end of 2025. Wyoming also cited future facility conversions at Jim Bridger Units 1 and 2, which have an enforceable conversion to natural gas by January 2024,¹⁰⁵ and Naughton Unit 3, which converted from coal to natural gas in 2019.

Third, the State considered the level of potential visibility improvements at issue. Wyoming stated that all seven Class I areas within the State are below the adjusted URP glidepath to attain natural conditions by 2064. It noted that potential additional controls, which

would reduce NO_x by 12,300 tons and SO₂ by 10,000 tons, would not impact the projected 2028 and 2064 visibility conditions in Wyoming Class I areas. According to the State, WRAP modeling indicates that potential additional controls would have "little to no influence" (less than 0.1 deciview)¹⁰⁶ on visibility improvement in Wyoming's Class I areas. Wyoming also pointed to the impact on visibility of sources beyond its control, noting that international anthropogenic sources and natural sources such as wildfires are large contributors to visibility impairment in the State's Class I areas.

The State ultimately concluded that imposing any additional costs on Wyoming sources is unwarranted during the second implementation period. Wyoming stated that it will continue to monitor Class I area visibility, regional haze, sources of emissions, and electrical and oil and gas markets, and will reevaluate its position in the next regional haze progress report due in January 2025.

2. The EPA's Evaluation

The EPA finds that Wyoming's selection of twelve sources to evaluate through four-factor analyses, as described in section IV.C.1. of this document, was reasonable. However, as detailed in sections IV.C.2.a.-d. below, we find that Wyoming's long-term strategy does not satisfy the requirements of CAA section 169A and 40 CFR 51.308(f)(2) on four separate grounds: (1) Wyoming failed to consider the required four statutory factors to analyze control measures for some selected sources to determine what is necessary to make reasonable progress, despite determining that those sources may affect visibility at certain Class I areas; (2) Wyoming did not document the technical basis of some of its decisions and made numerous calculation and other methodological errors; (3) Wyoming unreasonably rejected emission reduction measures for some sources; and (4) Wyoming's other reasons for not requiring any emission reduction measures in its long-term strategy (*e.g.*, its reliance on alleged economic hardships, historical and future emissions reductions, and lack of visibility improvement) are not adequately supported or lack foundation in the CAA and RHR. Therefore, we are proposing to disapprove Wyoming's long-term strategy for the second

implementation period under CAA section 169A and 40 CFR 51.308(f)(2). The following sections IV.C.2.a.-d. detail these separate bases for our proposed disapproval, with a focus on specific sources, units, and pollutants for illustrative purposes.

a. Failure To Perform a Four-Factor Analysis To Analyze Control Measures for Selected Sources To Determine What Is Necessary To Make Reasonable Progress

Under CAA section 169A and 40 CFR 51.308(f)(2), a state must submit a long-term strategy to make reasonable progress for Class I areas within the state and Class I areas outside the state that may be affected by the state's emissions. CAA section 169A(g)(1) and 40 CFR 51.308(f)(2)(i) provide that in determining the emission reduction measures necessary to make reasonable progress, the state must consider the following four factors:

- 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.

In its 2022 SIP submission, Wyoming determined that twelve stationary sources should be evaluated for additional controls due to their potential effect on visibility at Class I areas within the State and outside the State. For some of these sources, we acknowledge that there are several instances where the State appropriately relied on the effectiveness of existing controls or an existing federally enforceable commitment to cease operations as a reason to forgo a four-factor analysis. However, for other sources, neither the State nor the facility determined the emission reduction measures that are necessary for reasonable progress by considering the four statutory factors—nor did they provide technical documentation or other justification to support that lack of analysis—despite the State's determination that those sources may affect visibility at Class I areas. Therefore, we find that Wyoming failed to meet the requirements under CAA section 169A and 40 CFR 51.308(f)(2)(i) to consider the four statutory factors for the sources and associated units and pollutants listed in table 31 that may affect visibility at Class I areas.

¹⁰⁵ The EPA has proposed to approve Wyoming's 2022 SIP submission to convert Jim Bridger Units 1–2 from coal-fired boilers to natural gas-fired

boilers and establish associated NO_x and annual heat input limits. 89 FR 25200.

¹⁰⁶ Wyoming 2022 SIP Submission at 205.

TABLE 31—SOURCES, UNITS, AND ASSOCIATED POLLUTANTS THAT MAY AFFECT VISIBILITY AT CLASS I AREAS AND SELECTED FOR FOUR-FACTOR ANALYSIS WHERE NO FOUR-FACTOR ANALYSIS WAS PERFORMED

Source	Unit(s)	Associated pollutant(s)
Jim Bridger (<i>PacifiCorp</i>)	1, 2	NO _x , SO ₂ , PM
Jim Bridger (<i>PacifiCorp</i>)	3, 4	SO ₂ , PM
Naughton (<i>PacifiCorp</i>)	1, 2	NO _x , SO ₂ , PM
Naughton (<i>PacifiCorp</i>)	3	NO _x , PM
Dave Johnston (<i>PacifiCorp</i>)	1, 2	NO _x , SO ₂ , PM
Dave Johnston (<i>PacifiCorp</i>)	4	PM
Wyodak (<i>PacifiCorp</i>)	1	NO _x , SO ₂ , PM
Laramie River Station (<i>Basin Electric</i>)	1–3	PM
Laramie Portland Cement (<i>Mountain Cement Company</i>)	Kilns 1, 2	SO ₂
Elk Basin Gas Plant (<i>Contango Resources, Inc.</i>)	Engines (9) and incinerator	PM
Elk Basin Gas Plant (<i>Contango Resources, Inc.</i>)	Engines (9)	SO ₂
Elk Basin Gas Plant (<i>Contango Resources, Inc.</i>)	Incinerator	NO _x
Lost Cabin Gas Plant	Trains 2, 3	NO _x , PM

States are required to evaluate sources, or groups of sources, that may be affecting visibility at Class I areas within the state and outside the state. Although states have discretion under the RHR in identifying sources or groups of sources, the implementation plan must include a description of the criteria the state used to determine which sources or groups of sources it

evaluated and how the four factors were taken into consideration in selecting the measures for inclusion in its long-term strategy.¹⁰⁷ Many of the sources for

¹⁰⁷ CAA section 169A(b)(2)(B), CAA section 169A(g)(1), and 40 CFR 51.308(f)(2)(i). While states have discretion to select a reasonable set of sources for four-factor analysis, their selection should result in a set of pollutants and sources with the potential to meaningfully reduce contributions to visibility impairment. 2021 Clarifications Memo at 3 (noting

which Wyoming failed to conduct a four-factor analysis are among the largest contributors to visibility impairment in Class I areas, according to the State’s own Q/d analysis (table 32).

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that a source selection process that “excludes a state’s largest visibility impairing sources from selection is more likely to be unreasonable”).

Table 32—Wyoming Sources That the State Determined May Affect Class I Areas and Respective Q/d Values for Total NO_x, SO₂, and PM₁₀ Emissions at Affected Class I Areas

Class I Area*	Jim Bridger	Laramie River Station	Laramie Portland Cement	Naughton	Dave Johnston	Green River Works	Westvaco	Wyodak	Elk Basin	Granger Soda Ash	Lost Cabin Gas Plant	Cheyenne Fertilizer
	Q/d Value**											
Yellowstone NP (WY)	54.86	-	-	42.18	41.37	18.89	16.72	17.63	-	-	-	-
Grand Teton NP (WY)	60.93	-	-	56.25	39.17	23.15	20.69	-	-	-	-	-
Teton WA (WY)	63.18	-	-	48.97	44.27	22.07	19.58	18.05	-	-	-	-
Washakie WA (WY)	69.91	36.10	-	48.65	53.20	22.68	20.08	20.99	16.02	-	13.06	-
North Absaroka WA (WY)	50.11	-	-	36.59	43.53	16.72	14.77	19.62	23.86	-	-	-
Bridger WA (WY)	160.00	40.90	-	78.57	57.66	43.81	38.23	18.10	-	15.49	12.76	-
Fitzpatrick WA (WY)	104.94	36.36	-	67.94	50.95	34.35	30.36	18.29	-	12.43	11.51	-
Eagles Nest WA (CO)	53.63	50.49	14.77	-	-	15.72	13.51	-	-	-	-	-
Flat Tops WA (CO)	70.43	-	14.04	34.15	47.65	20.64	17.66	-	-	-	-	-
Maroon Bells-	51.49	38.54	-	28.02	-	16.02	13.79	-	-	-	-	-

Snowmass WA (CO)												
Mount Zirkel (CO)	84.97	72.24	27.06	34.19	69.51	21.24	18.12	16.38	-	-	-	-
Rawah WA (CO)	63.52	85.89	47.04	28.55	70.05	16.92	14.52	16.41	-	-	-	11.26
Rocky Mountain NP (CO)	55.60	76.51	31.39	-	60.43	15.45	13.27	-	-	-	-	12.33
West Elk WA (CO)	45.52	-	-	-	-	14.66	12.65	-	-	-	-	-
Red Rocks Lakes WR (MT)	39.58	-	-	34.12	-	14.54	12.92	-	-	-	-	-
Arches NP (UT)	47.26	-	-	33.54	-	17.56	15.26	-	-	-	-	-
Canyonland NP (UT)	42.29	-	-	30.49	-	15.63	13.60	-	-	-	-	-
Badlands NP (SD)	-	52.05	-	-	52.92	-	-	26.20	-	-	-	-
Wind Cave NP (SD)	-	73.36	-	-	77.33	-	-	37.53	-	-	-	-
Craters of the Moon WA (ID)	-	-	-	38.43	-	14.93	13.33	-	-	-	-	-
Jarbridge WA (NV)	-	-	-	29.33	-	-	-	-	-	-	-	-
Capitol Reef NP (UT)	-	-	-	30.66	-	14.67	12.86	-	-	-	-	-
Theodore Roosevelt NP (ND)	-	-	-	-	-	-	-	19.26	-	-	-	-

* NP = National Park; WA = Wilderness Area; WR = Wildlife Refuge; WY = Wyoming; CO = Colorado; SD = South Dakota; UT = Utah; MT = Montana; NV = Nevada; ND = North Dakota.

** The presence of a dash (“-”) indicates that the Q/d value for the source and associated Class I area is less than 10.

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Table 32 shows the Q/d value associated with each of the sources that Wyoming determined may affect visibility at Class I areas and that it selected for four-factor analysis. Q represents the total sum of NO_x, SO₂, and PM emissions, and d represents the distance (in kilometers) to the nearest Class I area. The larger the Q/d value, the greater the source’s expected effect on visibility in each associated Class I area. The State’s own analysis shows that Jim Bridger, Naughton, and Dave Johnston are expected to have the greatest effect on visibility at the seven Wyoming Class I areas, more than the other sources the State selected. Nevertheless, the State did not conduct

a four-factor analysis on any of those sources, except for a single unit (Unit 4) at Dave Johnston. Further, as detailed in sections IV.C.2.a.i.–iii. below, none of the reasons the State provided justify not conducting four-factor analyses of sources it determined may affect visibility at Class I areas to determine what is necessary for reasonable progress, as required under CAA section 169A(g)(1) and 40 CFR 51.308(f)(2)(i).

i. Reliance on Existing Controls Without Adequate Technical Documentation To Avoid Four-Factor Analysis of Sources That May Affect Visibility at Class I Areas

In declining to perform a four-factor analysis for Jim Bridger Units 1–4 and

Naughton Units 1–3, the State maintained that these sources have effective NO_x and SO₂ emissions control technologies in place. PacifiCorp argued in its submittal to the State (appendix C to the SIP submission) that these sources are exempt from further analysis under the EPA’s 2019 Guidance because they have effective NO_x and SO₂ emissions control technologies in place. PacifiCorp and the State specifically referred to the presence of: (1) FGD scrubber systems that meet the applicable alternative SO₂ MATS emissions limit; (2) NO_x and SO₂ emissions controls installed during the first planning period and operated year-round with an effectiveness of at least 90 percent on a pollutant-specific basis

(*e.g.*, FGD or SCR); (3) LNB/SOFA NO_x emission controls; and (4) BART-eligible units that installed and began operating controls to meet BART emission limits in the first planning period.

Without additional explanation from the State, the EPA disagrees that these sources' existing NO_x and SO₂ emissions controls exempt these sources from the requirement to consider the four statutory factors to determine whether additional controls are necessary for reasonable progress. The EPA's 2019 Guidance illustrates scenarios in which it may be reasonable for a state not to select a particular source for further analysis due to the source's existing emissions controls, including:

- For the purposes of SO₂ emissions control measures, FGD controls that meet the applicable alternative SO₂ emission limit of the 2012 MATS rule for coal-fired power plants (0.2 lb/MMBtu);

- For the purposes of SO₂ and PM emissions control measures, combustion of only pipeline natural gas;

- For the purposes of SO₂ and NO_x emissions control measures, FGD that operates year-round with an effectiveness of at least 90 percent or SCR that operates year-round with an overall effectiveness of at least 90 percent, on a pollutant-specific basis; and

- BART-eligible units that installed and began operating controls to meet BART emission limits for the first implementation period, on a pollutant-specific basis.¹⁰⁸

The premise underlying the flexibility for "effectively controlled" sources is that performing a four-factor analysis would be futile due to the unavailability of further cost-effective emission controls.¹⁰⁹ Indeed, some units at Jim Bridger and Naughton may already have effective controls installed on a pollutant-specific basis (*e.g.*, Jim Bridger Units 3–4 with SCR for NO_x emissions control and Naughton Unit 3 with combustion of pipeline natural gas for SO₂ emissions control), and we agree that it would be reasonable not to perform four-factor analyses for those particular units on a pollutant-specific basis. However, it is not readily apparent, due to the State's failure to provide a sufficient technical demonstration, that additional emission controls for NO_x or SO₂ at Jim Bridger and Naughton would not be cost-effective or reasonable. For example, the State could have evaluated post-

combustion NO_x controls (*e.g.*, SNCR and SCR) for Jim Bridger Units 1–2 and Naughton Units 1–3, which are currently equipped only with combustion controls. It may also be possible to achieve a lower SO₂ emissions rate at Jim Bridger Units 1–4¹¹⁰ and Naughton Units 1–2 by optimizing existing SO₂ emissions controls (*e.g.*, requiring existing scrubbers to run continuously at their maximum efficiencies), in addition to evaluating whether scrubber upgrades or tightening emission limits might be reasonable. Additionally, regardless of the State's determination that existing SO₂ emissions controls are effective, those existing controls may be necessary to make reasonable progress and therefore must be included in the SIP.¹¹¹ Wyoming's 2022 SIP submission does not address whether any of the existing SO₂ emissions controls at Jim Bridger and Naughton are necessary to make reasonable progress, and thus whether they are a part of Wyoming's long-term strategy for the second planning period. Moreover, the State did not address PM emissions controls in any context for any of these sources. Thus, the State failed to evaluate and determine the emission reduction measures that are necessary to make reasonable progress through consideration of the four statutory factors, as required by 40 CFR 51.308(f)(2), for Jim Bridger Units 1 and 2 for NO_x, SO₂, and PM; Jim Bridger Units 3 and 4 for SO₂ and PM; Naughton Units 1 and 2 for NO_x, SO₂, and PM; and Naughton Unit 3 for NO_x and PM.

Finally, for Laramie Portland Cement, the State notes that SO₂ emissions, which are currently controlled only through the inherent dry scrubbing processes of the rotary kiln itself, are consistently less than permitted allowable emissions (table 33) and have decreased by over 100 tons/year from 2014 to 2018. Wyoming appears to consider inherent dry scrubbing as an existing effective control that justifies the lack of a four-factor analysis for SO₂ controls at this source. However, because the State provides no details about the operation or emissions performance of the inherent dry scrubbing process, we cannot determine whether it is reasonable to assume that

a four-factor analysis would not identify any reasonable additional controls. The State does not address, and it is not clear based on the emissions information alone, whether further SO₂ reductions would be reasonable at Laramie Portland Cement, particularly emission limit tightening. The State is also silent as to whether the facility's existing control measures are necessary for reasonable progress and are a part of the state's long-term strategy for the second planning period.

TABLE 33—LARAMIE PORTLAND CEMENT ACTUAL AND PERMITTED SO₂ LIMITS

Unit	Permitted SO ₂ emissions	Actual SO ₂ emissions (2018)
	tons/year	
Kiln 1	438	114.2
Kiln 2	438	13.7

ii. Reliance on Unenforceable Source Retirements To Avoid Four-Factor Analysis

Wyoming also improperly relies on unenforceable source retirements to avoid conducting a four-factor analysis for certain sources. For example, Wyoming's SIP submission refers to planned retirements at Jim Bridger Units 1–2, Naughton Units 1–2, and Dave Johnston Units 1–2, as described in PacifiCorp's 2019 IRP and in PacifiCorp's submittal to Wyoming (appendix C to the Wyoming 2022 SIP submission). However, these shutdowns are not federally enforceable. Under the CAA and the RHR, a state's long-term strategy must include the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress.¹¹² Thus, if a state is relying on source shutdowns to forgo conducting a four-factor analysis (because a shutdown is effectively the most stringent control available), the shutdown must be federally enforceable (for example, through inclusion in the SIP).¹¹³

As PacifiCorp conceded in its submittal to the State, it has no legal obligation to close these units and is not committing to do so in connection with the second planning period SIP.¹¹⁴ Indeed, in the time since the State submitted its 2022 SIP submission, PacifiCorp has changed its planned

¹¹⁰ The EPA has not yet taken final action on Wyoming's separate SIP submission to convert Jim Bridger Units 1–2 from coal-fired boilers to natural gas-fired boilers and to establish associated NO_x and annual heat input limits. The proposed action is published at 89 FR 25200.

¹¹¹ CAA section 169A and 40 CFR 51.308(f)(2). Guidance on how to determine whether existing measures are necessary for reasonable progress is contained in the 2019 Guidance at 43 and the 2021 Clarifications Memo at 8–10.

¹¹² See CAA section 110(a), CAA section 169A(b)(2), and 40 CFR 51.308(f)(2).

¹¹³ Id. 2019 Guidance at 20.

¹¹⁴ 2022 Wyoming SIP submission, appendix C at C–7, C–10, C–14.

¹⁰⁸ 2019 Guidance at 24–25.

¹⁰⁹ 2019 Guidance at 22–23; 2021 Clarifications Memo at 5.

retirement of Naughton Units 1–2, which is now slated for 2036 despite PacifiCorp’s previous statements that the CCR rule necessitated a 2025 closure. Similarly, PacifiCorp has changed its retirement of Dave Johnston Units 1–2¹¹⁵ (now planned for 2028 instead of 2027) and Jim Bridger Units 1–2 (now planned for 2037 instead of 2023 and 2028, respectively).¹¹⁶ For Naughton specifically, we also disagree with the State’s reliance on the planned unenforceable retirements of Units 1 and 2 to calculate a revised Q/d value using only Unit 3, and then choosing to exempt the entire source from a four-factor analysis. These shifting plans underscore the importance of shutdowns being federally enforceable to justify excluding a source from conducting a four-factor analysis given that the SIP needs to meet the requirements of the CAA.

Because Wyoming has not demonstrated that these planned retirements are federally enforceable as required under the CAA and RHR, we find that the State unreasonably failed to consider the required four statutory factors to determine the emission reduction measures necessary to make reasonable progress for sources it determined may affect visibility at Class I areas.¹¹⁷

¹¹⁵ The State asserts that PacifiCorp submitted a notice to the Wyoming Department of Environmental Quality committing to cease combusting coal at these units before December 31, 2028 to meet requirements of the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category for regulation of wastewater discharges from power plants. Wyoming 2022 SIP Submission at 227. However, Wyoming did not submit a copy of that notice or explain why it amounts to a federally enforceable shutdown.

¹¹⁶ PacifiCorp Integrated Resource Plan, April 2024, at 13.

¹¹⁷ In addition to facility shutdowns, Wyoming stated that it considered emissions reductions associated with increased renewable energy generation in determining what measures are necessary to make reasonable progress. 2022 Wyoming SIP Submission at 203, 206. In its submittal to the State (appendix C to the Wyoming 2022 SIP submission), PacifiCorp cited expected changes in operating parameters at Jim Bridger, Naughton, and Dave Johnston to accommodate increased renewable energy deployment as an additional reason why the State should not require a four-factor analysis for these sources. The EPA has stated that “energy efficiency, renewable energy, and other such programs where there is a documented commitment to participate and a verifiable basis for quantifying any change in future emissions due to operational changes” may be relevant considerations in estimating 2028 emissions for source selection purposes. 2019 Guidance at 17. However, neither PacifiCorp nor Wyoming provided a verifiable basis for quantifying any projected future changes in emissions at these (or any other) sources that may result from participation in such programs.

iii. Other Improper Rationales for Not Performing Four-Factor Analyses

The State’s decision not to perform four-factor analyses for certain sources it selected is improper for several other reasons. For Jim Bridger, the State determined, without providing additional examination or explanation, that first planning period actions—specifically, the conversion to natural gas and associated NO_x and annual heat input limits¹¹⁸ for Units 1–2 and the monthly and annual NO_x and SO₂ emissions limits for Units 1–4—demonstrate that no further analysis for the second planning period is necessary. As we previously acknowledged, states may appropriately rely in some instances on the effectiveness of existing controls (including first planning period controls) or an existing federally enforceable commitment to cease operations to forgo a four-factor analysis. However, the existence of these first planning period obligations alone (none of which are currently federally enforceable), without adequate technical documentation of their effectiveness, does not automatically eliminate the requirement for a four-factor analysis in the second planning period if emissions from the facility continue to affect visibility at Class I areas.¹¹⁹ One of the fundamental requirements of the RHR is the requirement for periodic revisions of implementation plans at prescribed intervals in order to meet the national goal of preventing and remedying visibility impairment at Class I areas.¹²⁰ As explained in section IV.C.2.a.i. of this document, a four-factor analysis might have shown that more stringent NO_x and SO₂ controls are cost-effective and reasonable at Jim Bridger and thus necessary for reasonable progress. Ultimately, regardless of first planning period obligations and requirements, the State must continue to meet its regional haze obligations for the second planning period under the statute and the RHR.

¹¹⁸ The EPA has not yet taken final action on Wyoming’s 2022 SIP submission to convert Jim Bridger Units 1–2 from coal-fired boilers to natural gas-fired boilers and establish associated NO_x and annual heat input limits. Our proposed action is published at 89 FR 25200.

¹¹⁹ CAA section 169A requires states to conduct both a one-time BART evaluation as well as develop and submit a long-term strategy for making reasonable progress toward meeting the national goal for federal Class I areas every 10–15 years. In addition, 40 CFR 51.308(e)(5) states that “[a]fter a State has met the requirements for BART or implemented an emissions trading program or other alternative measure that achieves more reasonable progress than . . . BART, BART-eligible sources will be subject to the requirements of paragraphs (d) and (f) of this section.”

¹²⁰ 40 CFR 51.308(f).

Similarly, for Wyodak, the State’s decision not to conduct a four-factor analysis due to ongoing first planning period litigation is not justified. In its submittal to the State, PacifiCorp asserted, without explanation, that first planning period settlement negotiations may impact whether and how a four-factor analysis for the second planning period would be conducted for Wyodak.¹²¹ Nothing in CAA section 169A or the RHR supports excluding a source from analysis based on litigation and settlement negotiations, and the State provided no explanation for its decision to do so. Conducting a second planning period four-factor analysis for a source is not contingent on completion of first planning period obligations. Just as the presence of BART controls does not exempt sources from pursuing additional emission reduction measures that are shown to be necessary, through four-factor analysis, to make reasonable progress during the second planning period,¹²² the absence of BART (or other first implementation period controls) does not exempt sources from conducting a four-factor analysis to determine what emission reduction measures are necessary to make reasonable progress for subsequent planning periods. While the anticipated approach may have been for states to submit second planning period SIP revisions that take into account finalized first planning period measures, the obligation to submit a second planning period SIP revision was not suspended for states with outstanding first planning period obligations. As required, Wyoming submitted its second planning period SIP submission, which must include a long-term strategy for making reasonable progress, pursuant to the second planning period deadline. Consequently, the EPA has a statutory obligation to review and act on a SIP submission within one year after it has been deemed complete.¹²³

For the Lost Cabin Gas Plant, Wyoming did not conduct a four-factor analysis evaluating NO_x or PM emission reduction measures. As justification, the State explains that permitted NO_x and PM emissions account for only a “small fraction” of the total emissions from the facility.¹²⁴ However, the State did not show that these NO_x and PM emissions do not affect visibility in Class I areas. Nor did it supply information that NO_x or PM emissions are effectively

¹²¹ Wyoming 2022 SIP submission, appendix C at C–21.

¹²² See footnote 119.

¹²³ See CAA section 110(k)(2), 42 U.S.C. 7410(k)(2).

¹²⁴ Wyoming 2022 SIP submission at 178.

controlled or point to applicable regulations that may subject the facility to control measures that would limit future emissions increases. Given the lack of information regarding existing NO_x and PM controls or applicable regulations limiting these emissions, we cannot conclude that Wyoming’s decision not to conduct a four-factor analysis was reasonable or justified.

Finally, the State failed to conduct a four-factor analysis evaluating PM emission reduction measures for several sources, including Laramie River Station, Dave Johnston Unit 4, and the Elk Basin Gas Plant, despite doing so for NO_x and/or SO₂ control measures. For the Elk Basin Gas Plant, the State did not perform a four-factor analysis for NO_x control measures for the incinerator and SO₂ control measures for the nine compressor engines. It is unclear whether these omissions are intentional (e.g., based on effectively

controlled emissions or some other justification) or an oversight, as Wyoming did not address the absence of these four-factor analyses in its SIP submission.

In summary, we propose to disapprove Wyoming’s long-term strategy under CAA section 169A and 40 CFR 51.308(f)(2) because the State failed to consider the required four statutory factors to determine the measures necessary to make reasonable progress for certain sources it determined may affect visibility at Class I areas.

b. Failure To Document the Technical Basis of the State’s Determination of the Emission Reduction Measures Necessary To Make Reasonable Progress

In formulating their long-term strategies, states must comply with the requirements under CAA section 110(a), CAA section 169A, and 40 CFR 51.308(f)(2)(iii) to document the

technical basis, including modeling, monitoring, cost, engineering, and emissions information, on which they are relying to determine the emission reduction measures necessary to make reasonable progress. The EPA must exercise its independent technical judgment in evaluating the adequacy of the State’s long-term strategy, including the sufficiency of the underlying methodology and documentation; we may not approve a SIP that is based on unreasoned analysis or that lacks foundation in the CAA’s requirements.¹²⁵

As detailed in this section IV.C.2.b., we are proposing to disapprove Wyoming’s long-term strategy due to the State’s reliance on unsupported technical rationales and its failure to adequately document the technical basis on which it is relying to determine the emission reduction measures necessary to make reasonable progress (table 34).

TABLE 34—SOURCES, UNITS, AND ASSOCIATED POLLUTANTS WHERE THE STATE FAILED TO DOCUMENT THE TECHNICAL BASIS OF ITS DETERMINATION OF EMISSION REDUCTION MEASURES NECESSARY TO MAKE REASONABLE PROGRESS

Source	Unit(s)	Associated pollutant(s)
Dave Johnston (<i>PacifiCorp</i>)	4	SO ₂ .
Laramie Portland Cement (<i>Mountain Cement Company</i>)	Kilns 1, 2	NO _x .
Green River Works (<i>TATA Chemicals</i>)	Calciner 1, Calciner 2	NO _x , PM.
Elk Basin Gas Plant (<i>Contango Resources, Inc.</i>)	Engines (9)	NO _x .
Elk Basin Gas Plant (<i>Contango Resources, Inc.</i>)	Incinerator	SO ₂ .
Lost Cabin Gas Plant	Trains 2, 3	SO ₂ .

i. Laramie Portland Cement

We identified several consequential errors and unsupported technical rationales in the State’s evaluation of NO_x emission reduction measures for Laramie Portland Cement, where NO_x is currently controlled using good combustion practices (Kilns 1 and 2) and a 2-stage preheater (Kiln 2). Considered in the aggregate, the problems detailed in this section IV.C.2.b.i. prevent us from concluding that the State’s determination of the emission reduction measures for Laramie Portland Cement that are necessary to make reasonable progress is based on sound and adequately documented technical grounds.

First, there are consequential errors with the State’s calculation of the level of NO_x emissions reductions achievable through installing SNCR on Kiln 2. The State calculated the combined NO_x emissions reductions that could be achieved on both Kiln 1 and Kiln 2

considering 10%, 15%, 20%, and 25% SNCR control efficiencies.¹²⁶ In addition, the State (through information submitted by the facility in appendix L) provided baseline and controlled emissions rates, including NO_x emissions reductions estimates at 10% and 25% control efficiency, for Kiln 1 and Kiln 2 separately (table 35).¹²⁷

TABLE 35—WYOMING’S ANALYSIS OF LARAMIE PORTLAND CEMENT BASELINE AND ESTIMATED NO_x EMISSION REDUCTIONS FOR KILN 1 AND KILN 2 ASSOCIATED WITH SNCR NO_x CONTROLS AT 10% AND 25% CONTROL EFFICIENCY

Kiln	Baseline NO _x emissions	NO _x emissions reduction (control efficiency)
Kiln 1	722.8	72.3 (10%) 181 (25%)
Kiln 2	1,511.6	861 (10%) 970 (25%)

Using the baseline NO_x emission rate provided, we performed an accuracy check on the calculations of the NO_x emission reductions for Kiln 2¹²⁸ associated with 10% and 25% control efficiency. We multiplied the baseline

¹²⁵ See *Wyoming v. EPA*, 78 F.4th 1171, 1180–81 (10th Cir. 2023); *Oklahoma v. EPA*, 723 F.3d 1201 (10th Cir. 2013); *Arizona v. EPA*, 815 F.3d 519,

530–32 (9th Cir. 2016); *North Dakota v. EPA*, 730 F.3d 750, 760–61 (8th Cir. 2013).

¹²⁶ Wyoming 2022 SIP submission at 158.

¹²⁷ Wyoming 2022 SIP submission, appendix L.

¹²⁸ We found the State’s calculated NO_x reductions for Kiln 1 at 10% and 25% control efficiencies to be correct.

NO_x emissions (tons/year) with each control efficiency (%) to achieve the NO_x emissions reduction (tons/year) associated with each control efficiency (table 36).¹²⁹

TABLE 36—THE EPA’S ANALYSIS OF LARAMIE PORTLAND CEMENT ESTIMATED NO_x EMISSION REDUCTIONS FOR KILN 2 ASSOCIATED WITH SNCR NO_x CONTROLS AT 10% AND 25% CONTROL EFFICIENCY

Kiln	Baseline NO _x emissions	NO _x emissions reduction (level of control)
Kiln 2	1,511.6	151 (10%) 378 (25%)

We find that Wyoming overestimated the amount of NO_x emissions reductions by 710 tons/year at 10% control efficiency and 592 tons/year at 25% control efficiency. This overestimation appears to be the result of a math error. Because the State’s calculated NO_x emissions reductions associated with SNCR for Kiln 2 are incorrect, the emissions reductions for Kilns 1 and 2 combined, as well as the associated average cost effectiveness (\$/ton) shown in table 16 for all levels of control efficiencies, are also incorrect. Given that the error impacts the control efficiencies of various control technologies, the calculated emissions reductions and cost effectiveness values cannot be relied upon to determine what NO_x emissions control measures for Laramie Portland Cement are necessary to make reasonable progress.

Second, the State did not document the technical basis of the SNCR control efficiencies that were used to calculate costs of compliance for the four-factor analysis. The State evaluated the cost effectiveness of SNCR NO_x emission controls on Kiln 1 and Kiln 2 using control efficiencies ranging from a minimum of 10% to a maximum of 25% without any supporting documentation.¹³⁰ The EPA recognizes that it is challenging to predict the control efficiency of SNCR for long cement kilns.¹³¹ We agree that absent the use of post-installation control demonstrations to set NO_x emission limits, it is appropriate to include a range of control efficiencies in the four-factor analysis. However, Wyoming did

not justify its use of SNCR control efficiencies as low as 10–25% for Kiln 1 and Kiln 2. In 2017, we revised the Montana regional haze FIP NO_x emission limit on a long kiln in Montana. As part of that action, we assessed information on SNCR control efficiencies that had been demonstrated on long kilns since our promulgation of the original FIP and SNCR-based NO_x emission limit in 2012.¹³² We found that the control efficiency of SNCR installed on kilns as a result of consent decrees¹³⁴ is highly variable and ranges from 29% to 47%, with a mean of 40%.¹³⁵ Wyoming did not consider this or any other data showing higher SNCR efficiencies in the four-factor analysis for Laramie Portland Cement. While the facility asserted generally that other cement kilns “have challenges” and “are battling issues” with SNCR, it provided no documentation of the control efficiencies those other cement kilns have achieved.¹³⁶ Therefore, we find that Wyoming did not adequately document the technical basis of the control efficiencies it relied on, and, as a result, likely underestimated the cost effectiveness of SNCR.

Third, the State included the potential loss of cement kiln dust sales in its cost analysis without providing technical documentation to substantiate the expected loss. The State projected a loss of over \$13,000,000 in kiln dust sales across all control efficiencies due to purported contamination associated with the operation of SNCR.¹³⁷ This figure represents a very significant portion—over 76%—of the total annualized costs associated with SNCR on Kilns 1 and 2. However, Wyoming did not submit any documentation on the likelihood of contamination or the specific amount of projected lost sales, which greatly influenced the cost-effectiveness of controls. Given the lack of justification and supporting evidence, incorporating potential lost cement kiln dust sales into the cost analysis was unreasonable.

Fourth, the State did not provide technical documentation to support its

reliance on a 10-year amortization period and 10% interest rate in its cost analysis for SNCR on Kilns 1 and 2. The amortization period (also termed the remaining useful life) and interest rate are used to calculate annualized capital costs. Annualized capital costs ultimately determine, along with the tons of emissions reduced and additional annualized costs, the cost per ton of emissions reduced of the evaluated control technology. Wyoming used a 10-year equipment life for SNCR¹³⁸—half the 20-year amortization period specified in EPA’s Control Cost Manual¹³⁹—without providing documentation justifying that deviation or otherwise explaining why a 10-year equipment life is reasonable. And while the Control Cost Manual recommends using a firm-specific nominal interest rate if one is available,¹⁴⁰ the State provided no documentation to support its use of a 10% interest rate, which was more than double the bank prime rate as of January 2020¹⁴¹ (when the analysis was conducted) and well outside the range of similar firms’ interest rates.¹⁴²

EPA’s Control Cost Manual provides detailed technical guidance on the estimation of capital and annual costs for air pollution control devices for stationary sources. The Control Cost Manual is commonly used by the EPA, State and local officials, and industry parties that must comply with EPA regulations or EPA permits. EPA has been updating the Control Cost Manual under the authority of the Consolidated Appropriations Act of 2014.¹⁴³ Chapter

¹³⁸ Cost analyses found in appendix L of Wyoming’s 2022 SIP submission include an amortization period of 10 years for SNCR on Kilns 1 and 2. The narrative overview on page 157 of Wyoming’s 2022 SIP submission erroneously states that the cost analysis used an amortization period of 20 years.

¹³⁹ EPA, “Control Cost Manual,” section 4, chapter 1, April 2019, page 1–54, available at <https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution> (last visited January 2024).

¹⁴⁰ EPA, “Control Cost Manual,” section 1, chapter 2, November 2017, page 16, available at <https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution> (last visited January 2024).

¹⁴¹ Data from the Federal Reserve shows that the bank prime rate between November 2019 and February 2020 was 4.75% (See Bank Prime Rate Graph, March 25, 2024). <https://www.federalreserve.gov/releases/h15/> (last visited February 2024).

¹⁴² See, e.g., 2022 South Dakota Regional Haze State Implementation Plan. 2022. pp. 134, 137.

¹⁴³ Public Law 113–76 (2014); 160 Cong. Rec. H475, H979 (January 15, 2014) (stating that the process for reviewing regional haze SIPs “is well-served when EPA, States, and industry work collaboratively to ensure that dispersion models are continually improved and updated to ensure the most accurate predictions of visibility impacts, as well as a uniform set of cost estimates”).

¹²⁹ Laramie Portland Cement_EPA NO_x calculations January 2024.

¹³⁰ 2022 Wyoming SIP submission at 157–58.

¹³¹ 82 FR 17948, 17951 (April 14, 2017).

¹³² 82 FR 17948 (April 14, 2017).

¹³³ 82 FR 42738 (September 12, 2017).

¹³⁴ SNCR was installed on several wet or dry long kilns in association with consent decree enforcement actions.

¹³⁵ Technical Support Document—Oldcastle Trident Federal Implementation Plan Revision, March 8, 2017. See Attachment 1 to the TSD, Summary of SNCR Performance Data for Long Cement Kilns.

¹³⁶ Wyoming 2022 SIP submission, appendix L at L–29 to L–30. The facility also stated that SNCR at a cement plant in Tulsa owned by its parent company has been “operating with some success.” Id. at L–30.

¹³⁷ Wyoming 2022 SIP submission at 158 and appendix L at L–34 and L–38.

revisions undergo public notice and comment.¹⁴⁴ In the EPA's 2019 Guidance, we noted that if a state deviates from the principles and factors recommended in the Control Cost Manual, it should explain and document how its alternative approach is appropriate.¹⁴⁵ Because Wyoming provided no justification or documentation to support the unusually short amortization period and atypically high firm-specific interest rate it used to evaluate SNCR for Laramie Portland Cement, as required by 40 CFR 51.308(f)(2)(iii), we find that the State's cost analysis methodology lacks adequate technical support.

In summary, the multitude of methodological errors and unsupported technical bases, considered collectively, makes it impossible for us to determine the adequacy of the State's determination of the emission reduction measures for Laramie Portland Cement that are necessary to make reasonable progress.

ii. Lost Cabin Gas Plant

We identified several defects in the State's cost analysis for SO₂ controls at the Lost Cabin Gas Plant, including conflicting cost figures and SO₂ emissions data, use of an unsubstantiated amortization period and firm-specific interest rate, and an unjustifiably low estimate of wet scrubber control efficiency. Considered in the aggregate, the problems detailed in this section IV.C.2.b.ii. prevent us from concluding that the State's determination of the emission reduction measures for Lost Cabin Gas Plant that are necessary to make reasonable progress is based on sound and adequately documented technical grounds.

First, we find numerous discrepancies between the cost figures, specifically 'Total Annual Cost (\$/year)' and 'Cost per Ton of SO₂ Removed (\$/ton)' on pages 179 and 180 and appendix J of the Wyoming 2022 SIP submission.¹⁴⁶ Ultimately, these discrepancies lead to

¹⁴⁴ Id.; 81 FR 65352 (September 22, 2016) (section 1, chapter 2 on cost estimation concepts and methodology); 80 FR 33515 (June 12, 2015) (section 4, chapter 1 on SNCR and section 4, chapter 2 on SCR).

¹⁴⁵ 2019 Guidance at 31.

¹⁴⁶ On page 179 of the Wyoming 2022 SIP submission, annualized costs (\$/year) for the installation of wet scrubbers on Train 2 are \$1,442,233 and on Train 3 are \$2,438,411. These figures conflict with those listed on the following page (page 180) in table 11–34 for Train 2 (\$1,348,694) and Train 3 (\$2,272,044). Additionally, while the cost/ton figures on pages 179 and in table 11–34 are consistent for Train 2 (\$7,710/ton) and Train 3 (\$7,470/ton), they conflict with the cost/ton figures provided in appendix J for Train 2 (\$8,250/ton) and Train 3 (\$8,010/ton).

the inaccurate calculation of cost/ton of SO₂ emissions removed (\$/ton) in table 11–34 for both Trains 2 and 3.

Second, other aspects of Wyoming's cost analysis lack adequate documentation. The State provides no support for its reliance on a 15-year amortization period (remaining useful life) in its evaluation of wet scrubbers for SO₂ control,¹⁴⁷ which is half the useful life for wet scrubbers (30 years) recommended in the EPA's Control Cost Manual.¹⁴⁸ The State also relied on a 10% firm-specific interest rate—more than double the bank prime rate at the time of analysis—without offering any rationale or supporting documentation.¹⁴⁹ These factors are important inputs in the calculation of control technology cost effectiveness, and Wyoming's failure to substantiate them undermines its cost analysis.

Third, the State's use of a 90% control efficiency for wet scrubber SO₂ emissions control is not adequately supported. As documented in the Control Cost Manual, wet scrubbers typically achieve removal efficiencies of between 95% and 99% for most industrial applications, with many vendors publishing SO₂ removal efficiencies of over 99% for new wet FGD systems.¹⁵⁰ ¹⁵¹ We acknowledge the State's concern regarding the necessary water requirements to supply a 95% efficiency or greater wet scrubber system, which it cited as justification for using a 90% efficiency. However, the State makes no attempt to quantify or otherwise detail the incremental water requirements necessary to achieve a 95% or greater control efficiency to support its rejection of control efficiencies above 90% for a wet scrubber system. Without any supporting demonstration of the impact of those water requirements on the cost analysis, beyond a bare assertion that

¹⁴⁷ Wyoming's 2022 SIP submission at 180 and appendix J.

¹⁴⁸ EPA, "Control Cost Manual," section 5, chapter 1, April 2021, pages 1–8, 1–35, and 1–36, available at <https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution> (last visited February 2024).

¹⁴⁹ Data from the Federal Reserve shows that the bank prime rate between November 2019 and February 2020 was 4.75% (See Bank Prime Rate Graph, March 25, 2024). <https://www.federalreserve.gov/releases/h15/> (last visited February 2024).

¹⁵⁰ EPA, "Control Cost Manual," section 5, chapter 1, April 2021, pages 1–9 and 1–12 available at <https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution> (last visited February 2024).

¹⁵¹ The term "scrubber" is used to refer to control devices that use gas absorption to remove gases from waste gas streams. When used to remove SO₂ from flue gas, gas absorbers are commonly called flue gas desulfurization (FGD) systems.

supplying additional water would not be economical, we find the State's assumption of 90% wet scrubber control efficiency to be unfounded. Relatedly, despite its concern regarding the necessary water requirements for the operation of wet scrubbers, the State did not demonstrate why less water-intensive SO₂ emissions control options (*i.e.*, dry scrubbing) are not feasible. Indeed, dry scrubbing was identified in public comments as a potential control option.¹⁵² The State provided no explanation for its failure to evaluate whether dry scrubbing is an emission reduction measure that is necessary to make reasonable progress toward the national visibility goal.

Collectively, these factors—conflicting cost figures, an unsubstantiated amortization period and firm-specific interest rate, and an unjustifiably low estimate of wet scrubber control efficiency—undercut the technical support for Wyoming's cost analysis and its resulting conclusion that additional SO₂ controls are not cost-effective at the Lost Cabin Gas Plant.

iii. Elk Basin Gas Plant, Dave Johnston Unit 4, and Green River Works

Finally, some of the State's four-factor analyses are critically incomplete because there are gaps in technical analysis with no documentation or justification to support that lack of analysis. For example, the State provided no data or cost figures to support its decision not to evaluate additional SO₂ emissions control measures for Dave Johnston Unit 4, including possible upgrades to the existing spray dryer absorber, other than stating that scrubber upgrades are more effective than DSI for incremental pollution control removal.¹⁵³ In its evaluation of NO_x controls for Elk Basin Gas Plant's nine compressor engines and SO₂ controls for the plant's incinerator, the State omitted key elements necessary to determine cost-effectiveness: figures related to direct, indirect, and total costs; information necessary (*i.e.*, interest rate, amortization period) to determine the capital recovery factor and associated total annual costs and annualized capital costs; the assumed control efficiency of LEC NO_x emissions controls on the compressor engines; and the SO₂ emissions baseline for the incinerator.¹⁵⁴ And in its evaluation of NO_x and PM emissions controls for Calciner 1 and Calciner 2 at Green River

¹⁵² Wyoming 2022 SIP submission at 1,122.

¹⁵³ Wyoming 2022 SIP submission at 144.

¹⁵⁴ Wyoming 2022 SIP submission at 168–172.

Works, the State failed to provide a demonstration with supporting documentation that existing measures are likely not necessary to make reasonable progress, despite having made that showing for the C Boiler and D Boiler.¹⁵⁵

In summary, for the reasons explained in this section IV.C.2.b., we propose to

disapprove Wyoming’s long-term strategy under CAA section 169A and 40 CFR 51.308(f)(2) because the State relied on unsupported technical rationales and failed to adequately document the technical basis on which it relied to determine the emission reduction measures necessary to make reasonable progress.

c. Sources Where the State Unreasonably Rejected Potential Emission Reduction Measures

We also propose to disapprove Wyoming’s long-term strategy due to the State’s unreasonable rejection of emission reduction measures at the Elk Basin Gas Plant and the Cheyenne Fertilizer Facility (table 37).

TABLE 37—SOURCES, UNITS, AND ASSOCIATED POLLUTANTS AND EMISSION CONTROL TECHNOLOGY WHERE THE STATE UNREASONABLY REJECTED EMISSION REDUCTION MEASURES

Source	Unit(s)	Associated pollutant(s)	Emission control technology
Elk Basin Gas Plant (<i>Contango Resources, Inc.</i>)	Engines (9)	NO _x	LEC.
Cheyenne Fertilizer Facility (<i>Dyno Nobel, Inc.</i>)	ENG004, ENG005 (engines) ..	NO _x	LEC.
Cheyenne Fertilizer Facility (<i>Dyno Nobel, Inc.</i>)	CTW001, CTW003 (cooling towers).	PM	Upgraded Mist Eliminators.

In its evaluation of NO_x emissions controls for Elk Basin Gas Plant’s nine engines, the State determined the cost/ton of LEC to be between \$1,500–\$2,200 per ton of NO_x emissions reduced, with a total expected reduction of 1,793.5 tons of NO_x per year.¹⁵⁶ Similarly, the State determined the cost/ton of an LEC retrofit at Cheyenne Fertilizer Facility for engines ENG004 and ENG005 to be \$1,067 per ton of NO_x emissions reduced, with a total expected reduction of 229 tons of NO_x per year for each engine.¹⁵⁷ The State then rejected LEC control technology for both facilities despite concluding, after consideration of the four statutory factors as well as emission trends and permit conditions, that these facilities may warrant further analysis of emission controls to reach reasonable progress. Notably, Wyoming did not determine these cost/ton values for LEC to be unreasonable. Indeed, cost-effectiveness values of \$1,067–\$2,200 are in line with what the EPA and states found reasonable for regional haze control measures in the first planning period, even without adjusting for inflation.¹⁵⁸ While Wyoming stated it would further analyze these facilities in its next regional haze progress report, nothing in the CAA or RHR allows states to defer controls that are shown,

through four-factor analysis, to be necessary to make reasonable progress. States may not avoid their second planning period obligations by delaying decision making to a future date.¹⁵⁹

For its evaluation of PM emissions controls at the Cheyenne Fertilizer Facility on cooling towers CTW001 and CTW003, the State found the cost/ton for upgraded mist eliminators to be \$1,056 for CTW001 and \$2,368 for CTW003 per ton of PM emissions reduced, for total expected reductions of 15.5 tons (CTW001) and 2.4 tons (CTW003) of PM per year.¹⁶⁰ Here again, Wyoming did not determine these cost/ton values to be unreasonable. However, the State concluded that the total capital investment for upgraded mist eliminators of \$153,600 (for CTW001) and \$53,990 (for CTW003) was not justified given what it considered to be the “minute” amount of emissions reductions that could be achieved; the State also cited declining PM emissions trends. At the same time, Wyoming concluded that the Cheyenne Fertilizer Facility may warrant further analysis of emission controls in the next regional haze progress report. We find that the State did not adequately justify its rejection of upgraded mist eliminators. Wyoming inappropriately relied on

declining emissions trends—which is not one of the four statutory factors—to summarily reject controls shown to be cost-effective and otherwise reasonable through four-factor analysis.

In summary, we propose to disapprove Wyoming’s long-term strategy under 40 CFR 51.308(f)(2) because the State unreasonably rejected potential controls for certain sources and thus did not reasonably determine the emission reduction measures necessary to make reasonable progress.

d. Other Unjustified Reasons for Rejecting All Additional Emission Reduction Measures

After evaluating potential emission reduction measures at the source-specific level, Wyoming explained its overall reasoning for not requiring any additional measures in its long-term strategy to make reasonable progress for the second planning period for affected Class I areas.¹⁶¹ Whether individually or in combination, Wyoming’s reasons are not supported by the CAA and the RHR and provide another basis for our proposed disapproval of Wyoming’s long-term strategy.

First, Wyoming unreasonably relied on generalized and unsubstantiated assertions that any emission reduction

¹⁵⁵ Wyoming 2022 SIP submission at 166–167.
¹⁵⁶ Wyoming 2022 SIP submission at 168. As explained in section IV.C.2.a.iii., the State did not supply key information necessary for the EPA to determine the appropriateness of this cost analysis.
¹⁵⁷ Wyoming 2022 SIP submission at 184.
¹⁵⁸ The 2019 Guidance emphasized that “[w]hen the cost/ton of a possible measure is within the range of the cost/ton values that have been incurred multiple times by sources of similar type to meet regional haze requirements or any other CAA requirement, this weighs in favor of concluding that the cost of compliance is not an obstacle to the measure being considered necessary to make reasonable progress.” 2019 Guidance at 40. After

evaluating first planning period cost of compliance values, plus the other BART statutory factors and/ or the four reasonable progress statutory factors, the vast majority of cost/ton values < \$2,500/ton were found to be reasonable and cost-effective. Examples for several sources can be found at: 76 FR 16168, 16180–81 (Mar. 22, 2011) (proposed), finalized at 76 FR 81728 (Dec. 28, 2011) (Oklahoma); 76 FR 58570, 58586 (Sept. 21, 2011) (proposed), finalized at 77 FR 20894 (Apr. 6, 2012) (North Dakota); 77 FR 24794, 24817 (Apr. 25, 2012) (proposed), finalized at 77 FR 51915 (Aug. 28, 2012) (New York); 77 FR 18052, 18070–71 (Mar. 26, 2012) (proposed), finalized at 77 FR 76871 (Dec. 31, 2012) (Colorado); and 77 FR 73369, 73378 (Dec. 10, 2012) (proposed),

finalized at 78 FR 53250 (Aug. 29, 2013) (Florida). These costs have not been adjusted for inflation.
¹⁵⁹ *C.f. NRDC v. EPA*, 22 F.3d 1125, 1134 (D.C. Cir. 1994) (noting that SIPs must “contain[] something more than a mere promise to take appropriate but unidentified measures in the future”). In addition, because progress reports due in 2025 will not take the form of SIP revisions that must be approved or disapproved by EPA, it is not clear how Wyoming could evaluate and potentially impose emission reduction measures at Elk Basin Gas Plant through that process. *See generally* 40 CFR 51.308(g).
¹⁶⁰ Wyoming 2022 SIP submission at 185.
¹⁶¹ Wyoming 2022 SIP Submission at 203–06.

measures would impose economic hardships on sources and negatively affect rural communities. Wyoming provided no analyses, data, or other evidence to support its assertions that the cost of additional controls could force energy producers out of the market, harm ratepayers, impose economic stress on rural communities, or cause grid instability. In CAA section 169A, Congress established the national goal of preventing any future and remedying any existing impairment of visibility in Class I areas; it then directed states to develop SIPs containing long-term strategies comprised of emission limits, schedules of compliance, and other measures necessary to make reasonable progress toward that national goal through consideration of the four statutory factors.¹⁶² Wyoming cannot overcome Congress's express mandate by relying on an unsupported policy position that any additional control costs will cause unwarranted economic harm.

Second, past and projected emissions reductions do not support Wyoming's rejection of all additional control measures for the second planning period. To support its determination that no further emissions reductions are warranted, Wyoming pointed to first implementation period measures, increasing renewable energy generation, facility shutdowns and conversions, and measures taken in other states and nationwide. The RHR, however, sets out an iterative planning process by which states have a continuing obligation to determine the emission reduction measures necessary to make reasonable progress in each implementation period. As we recognized in the 2017 RHR Revisions, while first implementation period measures resulted in significant reductions in emissions nationwide, continued progress is still necessary and is required by statute.¹⁶³ The fact that some emissions reductions have already been achieved and are expected to occur in the future, whatever the source of those reductions, does not exempt states from determining the measures necessary to make reasonable progress based on consideration of the four statutory factors in each planning period. Furthermore, as detailed in section IV.C.2.a.ii. of this document, the facility shutdowns cited by the State (with the exception of Dave Johnston Unit 3) are not federally enforceable or have otherwise not been validated. Nor did Wyoming quantify or substantiate the changes in emissions that it believes

will occur due to increased renewable energy generation.¹⁶⁴

Third, Wyoming unreasonably pointed to other sources' contribution to visibility impairment in the State's Class I areas as a reason not to require its own emission reduction measures. But nothing in the CAA or RHR authorizes the rejection of control measures that are shown to be appropriate through four-factor analysis on the basis that some portion of visibility-impairing pollutants affecting Class I areas originates from international anthropogenic sources or natural sources such as wildfires. The four statutory factors do not include a state's relative level of contribution of visibility-impairing pollutants. Indeed, Congress's national goal is "the prevention of *any* future, and the remedying of *any* existing, impairment of visibility in mandatory Class I Federal areas which impairment results from manmade air pollution," including visibility impairment caused by sources within the states.¹⁶⁵

Fourth, Wyoming improperly relied on the fact that its seven Class I areas are currently below the adjusted URP and are projected to remain so in 2028. As the EPA has consistently explained, states may not use the URP as a "safe harbor" to conclude that additional emission reduction measures are not necessary for reasonable progress. The 2017 RHR explains that the CAA requires that each SIP revision contain long-term strategies for making reasonable progress, and that in determining reasonable progress states must consider the four statutory factors. Treating the URP as a safe harbor would be inconsistent with the statutory requirement that states assess the potential to make further reasonable progress towards natural visibility goal in every implementation period. Even if a state is currently on or below the URP, there may be sources contributing to visibility impairment for which it would be reasonable to apply additional control measures in light of the four factors. Although it may conversely be the case that no such sources or control measures exist in a particular state with respect to a particular Class I area and implementation period, this should be determined based on a four-factor analysis for a reasonable set of in-state sources that are contributing the most to the visibility impairment that is still occurring at the Class I area. It would bypass the four statutory factors and

undermine the fundamental structure and purpose of the reasonable progress analysis to treat the URP as a safe harbor, or as a rigid requirement.¹⁶⁶ The EPA reiterated this concept in the 2019 Guidance¹⁶⁷ and in the 2021 Clarifications Memo.¹⁶⁸ The CAA and RHR do not include the URP among the four factors states must consider in developing their long-term strategies. Treating the URP as a safe harbor, as Wyoming has done, is inconsistent with statutory requirements and undermines the core structure of an appropriate regional haze analysis.

Finally, Wyoming claims that WRAP modeling indicates that "potential additional controls will have little to no influence (< 0.1 dv)" on visibility conditions at Wyoming Class I areas.¹⁶⁹ There is no basis for Wyoming's assertion. First, the State does not explain what "potential additional controls" on Wyoming sources were modeled; our review of the WRAP modeling information shows that none were. To support its claim, Wyoming pointed to the figures in Chapter 15 of its SIP submission, which show visibility modeling results for various emission scenarios: the WRAP modeling scenario "2028OTBa2" ("On the Books Inventory") reflects emissions levels associated with implementation by 2028 of all applicable "on the books" federal and state requirements;¹⁷⁰ the WRAP modeling scenario "PAC2" ("Potential Additional Controls") reflects emissions levels associated with implementation of potential additional controls beyond those included in the 2028OTBa2/"On the Books Inventory" scenario.¹⁷¹ No potential additional control measures beyond the "on the books inventory" were modeled for Wyoming, as indicated in tables 9–1 through 9–4 of Wyoming's 2022 SIP submission,¹⁷² WRAP spreadsheets for the modeling scenarios,¹⁷³ and other WRAP modeling documentation.¹⁷⁴ Instead, the < 0.1

¹⁶⁶ 82 FR 3099–3100.

¹⁶⁷ 2019 Guidance at 49.

¹⁶⁸ 2021 Clarifications Memo at 15.

¹⁶⁹ Wyoming 2022 SIP Submission at 205.

¹⁷⁰ WRAP Technical Support Systems for Regional Haze Planning: Emissions Methods, Results, and References, September 30, 2021 ("WRAP Emissions Reference"), 7–9.

¹⁷¹ Id. at 11.

¹⁷² Wyoming 2022 SIP submission at 115–119. A comparison of the columns titled '2028OTBa2' and '2028 PAC2' in tables 9–1 through 9–4 shows that NO_x, SO_x, PM₁₀, and PM_{2.5} emissions levels for Wyoming sources are the same.

¹⁷³ WRAP PAC2 and 2028OTBa2_August 17 2021. Comparing the Wyoming emissions levels listed in the summary tables on the 'WRAP 2028PAC2 point emissions' and 'WRAP 2028OTBa2 point emissions' worksheets shows that Wyoming emissions for the two scenarios are the same.

¹⁷⁴ WRAP Emissions Reference, table 5 at 11.

¹⁶² See CAA sections 169A(a)(1), (b)(2)(B), and (g)(1).

¹⁶³ 82 FR 3080.

¹⁶⁴ See footnote 117.

¹⁶⁵ CAA section 169A(a)(1) (emphasis added); section 169A(b)(2) (requiring states to develop SIPs to address visibility impairment).

deciview modeled visibility improvement that Wyoming referenced is attributable to potential emission reductions in other states.¹⁷⁵ Simply put, Wyoming did not model visibility improvements associated with the emission reduction measures it considered, and rejected, through four-factor analysis. The State therefore had no basis to conclude that potential additional controls would have little to no influence on visibility conditions at its Class I areas.¹⁷⁶

In conclusion, Wyoming’s unsubstantiated reasons for not requiring any additional emission reduction measures as part of its long-term strategy to make reasonable progress lack foundation in the CAA and RHR. Therefore, we propose to disapprove Wyoming’s long-term strategy under CAA section 169A and 40 CFR 51.308(f)(2).

e. Other Long-Term Strategy Requirements (40 CFR 51.308(f)(2)(ii)–(iv))

States must meet the additional requirements specified in 40 CFR 51.308(f)(2)(ii)–(iv) when developing their long-term strategies. 40 CFR 51.308(f)(2)(ii) requires states to consult with other states that have emissions that are reasonably anticipated to contribute to visibility impairment in Class I areas to develop coordinated emission management strategies. Chapters 14.7.2 through 14.7.5 of Wyoming’s 2022 SIP submission describe the State’s consultation with other states throughout the development of its regional haze plan.

40 CFR 51.308(f)(2)(iii) requires states to document the technical basis, including modeling, monitoring, costs, engineering, and emissions information, on which the state is relying to determine the emission reduction measures that are necessary to make reasonable progress in each mandatory Class I area it impacts. The State relied on WRAP technical information, modeling, and analysis to support development of its long-term strategy.¹⁷⁷

40 CFR 51.308(f)(2)(iv) specifies five additional factors states must consider in developing their long-term strategies. The five additional factors are: emission reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment; measures to mitigate the impacts of construction activities; source retirement and replacement schedules; basic smoke management practices for prescribed fire used for agricultural and wildland vegetation management purposes and smoke management programs; and the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the long-term strategy. Chapter 14.5 of Wyoming’s 2022 SIP submission describes each of the five additional factors.

Regardless, as explained in the preceding sections, due to flaws and omissions in its four-factor analyses and the resulting control determinations, we find that Wyoming failed to reasonably “evaluate and determine the emission reduction measures that are necessary to make reasonable progress” by considering the four statutory factors as

required by CAA section 169A(b)(2)(A), CAA section 169A(g)(1), and 40 CFR 51.308(f)(2)(i). We also find that Wyoming failed to adequately document the technical basis that it relied upon to determine these emissions reduction measures, as required by 40 CFR 51.308(f)(2)(iii). In so doing, Wyoming failed to submit to the EPA a long-term strategy that includes “the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress.”¹⁷⁸ Consequently, the EPA finds that the Wyoming’s 2022 SIP submission does not satisfy the long-term strategy requirements of 40 CFR 51.308(f)(2). Therefore, we are proposing to disapprove these corresponding portions of Wyoming’s 2022 SIP submission.

D. Reasonable Progress Goals

Section 51.308(f)(3)(i) requires a state in which a Class I area is located to establish RPGs—one each for the most impaired and clearest days—reflecting the visibility conditions that will be achieved at the end of the implementation period as a result of the emission limitations, compliance schedules and other measures required under paragraph (f)(2) in states’ long-term strategies, as well as implementation of other CAA requirements.

After establishing its long-term strategy, Wyoming developed reasonable progress goals for each Class I area for the 20% most impaired days and 20% clearest days based on the results of 2028 WRAP modeling (table 38).¹⁷⁹

TABLE 38—REASONABLE PROGRESS GOALS FOR THE 20% MOST IMPAIRED DAYS AND 20% CLEAREST DAYS FOR WYOMING CLASS I AREAS

Class I Area	20% Most impaired days			20% Clearest days	
	Average baseline conditions (2000–2004)	2028 Uniform progress goal ¹	2028 Reasonable progress goal ²	Average baseline conditions (2000–2004)	2028 Reasonable progress goal
	Deciviews				
Grand Teton National Park	8.3	7.2	7	2.6	2.3
Teton Wilderness Area					
Yellowstone National Park					

¹⁷⁵ Table 5 of the WRAP Emissions Reference identifies the states that included “Potential Additional Controls” beyond “On the Books” emissions controls to evaluate the potential visibility response in 2028. The “WRAP 2028PAC2 point emissions” worksheet in the WRAP PAC2 and 2028OTBa2_August 17 2021 file lists the emissions levels that were modeled for those states.

¹⁷⁶ In addition, Wyoming said nothing about potential visibility improvements at out-of-state Class I areas. Under CAA section 169A(b)(2) and 40 CFR 51.308(f)(2), Wyoming’s long-term strategy

must address regional haze visibility impairment at both in-state and out-of-state Class I areas that may be affected by emissions from Wyoming sources.

¹⁷⁷ Wyoming 2002 SIP submission at 24–25.

¹⁷⁸ See also CAA section 169A(b)(2), 169A(b)(2)(B) (requiring regional haze SIPs to “contain such emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal, . . . including . . . a long-term . . . strategy for making reasonable progress[.]”) and CAA section 110(a)(2)(A)

(requiring SIPs to contain “enforceable emission limitations and other control measures, means, or techniques . . . as well as schedules and timetables for compliance.”

¹⁷⁹ Wyoming 2022 SIP submission at 234–236.

TABLE 38—REASONABLE PROGRESS GOALS FOR THE 20% MOST IMPAIRED DAYS AND 20% CLEAREST DAYS FOR WYOMING CLASS I AREAS—Continued

Class I Area	20% Most impaired days			20% Clearest days	
	Average baseline conditions (2000–2004)	2028 Uniform progress goal ¹	2028 Reasonable progress goal ²	Average baseline conditions (2000–2004)	2028 Reasonable progress goal
	Deciviews				
North Absaroka Wilderness Area	8.8	8.1	6.9	2.0	1.7
Washakie Wilderness Area					
Bridger Wilderness Area	8	7.1	6.3	2.1	1.8
Fitzpatrick Wilderness Area					

¹ Based on the adjusted glidepath.

² Based on WRAP 2028OTBa2.

The reasonable progress goals are based on Wyoming’s long-term strategy, the long-term strategy of other states that may affect Class I areas in Wyoming, and other CAA requirements. Per 40 CFR 51.308(f)(3)(iv), the EPA must evaluate the demonstrations the State developed pursuant to 40 CFR 51.308(f)(2) to determine whether the State’s reasonable progress goals for visibility improvement provide for reasonable progress towards natural visibility conditions. As previously explained in sections IV.C.2.a.–d., we are proposing to disapprove Wyoming’s long-term strategy for failing to meet the requirements of 40 CFR 51.308(f)(2).¹⁸⁰ Therefore, we also propose to disapprove Wyoming’s reasonable progress goals under 40 CFR 51.308(f)(3) because compliance with that requirement is dependent on compliance with 40 CFR 51.308(f)(2).

E. Reasonably Attributable Visibility Impairment (RAVI)

The RHR contains a requirement at 40 CFR 51.308(f)(4) related to any additional monitoring that may be needed to address visibility impairment in Class I areas from a single source or

¹⁸⁰ Wyoming’s 2022 SIP submission does not include enforceable source retirement dates or any enforceable emission reduction measures in the long-term strategy for the second planning period under 40 CFR 51.308(f)(2). However, projected emissions reductions reflecting the planned—but not enforceable—shutdowns of Naughton Units 1 and 2 and Dave Johnston Units 1 and 2 are included in the 2028 WRAP modeling scenario (WRAP 2028OTBa2 and RepBase2, August 17 2021 in the docket) that Wyoming used as the basis of its 2028 reasonable progress goals under 40 CFR 51.308(f)(3). As noted in section IV.C.2.a.ii. of this document, PacifiCorp has already pushed back those sources’ planned retirement dates in the time since Wyoming finalized its 2022 SIP submission. Because Wyoming’s reasonable progress goals reflect projected emission reductions that are not enforceable and are not included in the SIP, they do not comport with 40 CFR 51.308(f)(3)(i)’s requirement that reasonable progress goals reflect enforceable emissions limitations, compliance schedules, and other measures.

a small group of sources. This is called “reasonably attributable visibility impairment,”¹⁸¹ also known as RAVI. Under this provision, if the EPA or the FLM of an affected Class I area has advised a state that additional monitoring is needed to assess RAVI, the state must include in its SIP revision for the second implementation period an appropriate strategy for evaluating such impairment. The EPA has not advised the State to that effect; nor did the State indicate that FLMs for Bridger Wilderness Area, Fitzpatrick Wilderness Area, Grand Teton National Park, North Absaroka Wilderness Area, Teton Wilderness Area, Washakie Wilderness Area, and Yellowstone National Park identified any RAVI from Wyoming sources. For this reason, the EPA proposes to approve the portions of Wyoming’s 2022 SIP submission relating to 40 CFR 51.308(f)(4).

F. Monitoring Strategy and Other State Implementation Plan Requirements

Section 51.308(f)(6) specifies that each comprehensive revision of a state’s regional haze SIP must contain or provide for certain elements, including monitoring strategies, emissions inventories, and any reporting, recordkeeping and other measures needed to assess and report on visibility. A main requirement of this section is for states with Class I areas to submit monitoring strategies for measuring, characterizing, and reporting on visibility impairment. Compliance with this requirement may be met through participation in the IMPROVE network.

Under 40 CFR 51.308(f)(6)(i), States must provide for the establishment of additional monitoring sites or

¹⁸¹ The EPA’s visibility protection regulations define “reasonably attributable visibility impairment” as “visibility impairment that is caused by the emission of air pollutants from one, or a small number of sources.” 40 CFR 51.301.

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. For states with Class I areas (including Wyoming), § 51.308(f)(6)(ii) requires SIPs to provide for procedures by which monitoring data and other information are used in determining the contribution of emissions from within the state to regional haze visibility impairment at mandatory Class I Federal areas both within and outside the state. Section 51.308(f)(6)(iv) requires the SIP to provide for the reporting of all visibility monitoring data to the Administrator at least annually for each Class I area in the state. 40 CFR 51.308(f)(6)(v) requires SIPs to provide for a statewide inventory of emissions of pollutants that are reasonably anticipated to cause or contribute to visibility impairment, including emissions for the most recent year for which data are available. Section 51.308(f)(6)(v) also requires states to include estimates of future projected emissions. Finally, 40 CFR 51.308(f)(6)(vi) requires the SIP to provide for any other elements, including reporting, recordkeeping, and other measures, that are necessary for states to assess and report on visibility.

Wyoming describes its participation in the IMPROVE network, which is comprised of 110 monitoring sites across the nation, three of which are in Wyoming. The State relied on the IMPROVE monitoring network to assess visibility at Class I areas across Wyoming¹⁸² and considered the three monitoring sites, YELL2, NOAB1, and BRID1, to be adequate for assessing reasonable progress goals at the State’s seven Class I areas.¹⁸³ Using the monitoring data procedures described in its 2022 SIP submission along with

¹⁸² Wyoming 2022 SIP submission at 31–32.

¹⁸³ *Id.* at 34–63.

other technical information supplied by WRAP,¹⁸⁴ the State determined the contribution of in-State emissions to Class I areas inside and outside Wyoming.¹⁸⁶ In addition, the State also provided a statewide inventory of emissions that are reasonably anticipated to cause or contribute to visibility impairment in Class I areas; the State relied primarily on 2014 data but also estimated future projected emissions.¹⁸⁷

The EPA finds that Wyoming has met the requirements of 40 CFR 51.308(f)(6), including through its continued participation in the IMPROVE network and WRAP RPO and its ongoing compliance with the Air Emissions Reporting Requirements (AERR). There is no indication that further SIP elements are necessary at this time for Wyoming to assess and report on visibility. Therefore, the EPA proposes to approve the monitoring strategy and other state implementation plan elements of Wyoming's 2022 SIP submission as meeting the requirements of 40 CFR 51.308(f)(6).

G. Requirements for Periodic Reports Describing Progress Towards the Reasonable Progress Goals

40 CFR 51.308(f)(5) requires that periodic comprehensive revisions of states' regional haze plans also address the progress report requirements of 40 CFR 51.308(g)(1) through (5). The purpose of these requirements is to evaluate progress towards the applicable RPGs for each Class I area within the state and each Class I area outside the state that may be affected by emissions from within that state. Sections 51.308(g)(1) and (2) apply to all states and require a description of the status of implementation of all measures included in a state's first implementation period regional haze plan and a summary of the emission reductions achieved through implementation of those measures. Section 51.308(g)(3) applies only to states with Class I areas within their borders and requires such states to assess current visibility conditions, changes in visibility relative to baseline (2000–2004) visibility conditions, and changes in visibility conditions relative to the period addressed in the first implementation period progress report. Section 51.308(g)(4) applies to all states

and requires an analysis tracking changes in emissions of pollutants contributing to visibility impairment from all sources and sectors since the period addressed by the first implementation period progress report. This provision further specifies the year or years through which the analysis must extend depending on the type of source and the platform through which its emission information is reported. Finally, 40 CFR 51.308(g)(5), which also applies to all states, requires an assessment of any significant changes in anthropogenic emissions within or outside the state that have occurred since the period addressed by the first implementation period progress report, including whether such changes were anticipated and whether they have limited or impeded expected progress towards reducing emissions and improving visibility.

In its 2022 SIP submission, Wyoming included the elements of the periodic progress report specified in 40 CFR 51.308(f)(5) and 40 CFR 51.308(g)(1)–(5). Wyoming summarized the facility improvements made during and after the first implementation period, including emission control measures installed and emission reductions achieved by the facilities that most affected each Class I area.¹⁸⁸ In addition, the State summarized the implementation status of ongoing air pollution control programs, measures to mitigate construction activities, source retirement and replacement schedules, and smoke management practices and programs, as well as projected changes in point, area, and mobile source emissions.¹⁸⁹ The State also provided emissions inventories for NO_x, SO₂, PM, and CO that identify the type of source, activity, and pollutant representing 2014 actual emissions and 2014–2018 representative baseline emissions.¹⁹⁰

Visibility conditions (in deciviews) are reported in Wyoming's 2022 SIP submission for the most impaired and clearest days. Visibility conditions are expressed in terms of 5-year averages for the baseline period (2000–2004), 2008–2012 period, and current period (2014–2018), as well as the progress made since the baseline period ((2000–2004)–(2014–2018)) and during the last implementation period ((2008–2012)–(2014–2018)) for each Class I area.¹⁹¹ Wyoming also provided an assessment and discussion of the significant

changes in anthropogenic emissions since the first implementation period.¹⁹²

Because Wyoming's 2022 SIP submission addresses the requirements of 40 CFR 51.308(g)(1) through (5), the EPA finds that Wyoming has met the progress report requirements of 40 CFR 51.308(f)(5). Therefore, we propose to approve Wyoming's 2022 SIP submission as meeting the requirements of 40 CFR 51.308(f)(5) and 40 CFR 51.308(g) for periodic progress reports.

H. Requirements for State and Federal Land Manager Coordination

Section 169A(d) of the CAA requires states to consult with FLMs before holding the public hearing on a proposed regional haze SIP, and to include a summary of the FLMs' conclusions and recommendations in the notice to the public. In addition, the 40 CFR 51.308(i)(2) FLM consultation provision requires a state to provide FLMs with an opportunity for consultation that is early enough in the state's policy analyses of its emission reduction obligation so that information and recommendations provided by the FLMs can meaningfully inform the state's decisions on its long-term strategy. If the consultation has taken place at least 120 days before a public hearing or public comment period, the opportunity for consultation will be deemed early enough. Regardless, the opportunity for consultation must be provided at least sixty days before a public hearing or public comment period at the state level. Section 51.308(i)(2) also lists two substantive topics on which FLMs must be provided an opportunity to discuss with states: assessment of visibility impairment in any Class I area and recommendations on the development and implementation of strategies to address visibility impairment. Section 51.308(i)(3) requires states, in developing their implementation plans, to include a description of how they addressed FLMs' comments.

Wyoming's 2022 SIP submission summarizes the State's consultation and coordination with the FLMs. In August and September 2020, Wyoming began initial consultation and provided the FLMs with the four-factor analyses that were performed for Wyoming's sources. Subsequent consultation meetings with the FLMs were held every 4–8 weeks. Wyoming shared a complete draft of the SIP with the FLMs on August 10, 2021, which initiated the 60-day consultation period. Following the FLM consultation period, a 30-day public comment period took place in February and March 2022,

¹⁸⁴ Id. at 31–33.

¹⁸⁵ Wyoming relied on the WRAP Technical Support System (TSS) "Analysis and Planning" section to determine baseline, natural, and current conditions for Class I areas in Wyoming. <https://views.cira.colostate.edu/tssv2/>.

¹⁸⁶ Wyoming 2022 SIP submission at 34–106.

¹⁸⁷ Id. at 114–120.

¹⁸⁸ Wyoming 2022 SIP submission at 212–223.

¹⁸⁹ Id. at 223–229.

¹⁹⁰ Id. at 114–120.

¹⁹¹ Id. at 42–61.

¹⁹² Id. at 114–120.

followed by a public hearing conducted on March 23, 2022.¹⁹³ The State explained how it addressed comments received by the FLMs¹⁹⁴ and committed to coordinating and consulting with the FLMs during the development of future progress reports and SIP submissions, as well as during the implementation of programs having the potential to contribute to visibility impairment in Class I areas.¹⁹⁵

Compliance with 40 CFR 51.308(i) is dependent on compliance with 40 CFR 51.308(f)(2)'s long-term strategy provisions and 40 CFR 51.308(f)(3)'s reasonable progress goals provisions. Because the EPA is proposing to disapprove Wyoming's long-term strategy under 51.308(f)(2) and the reasonable progress goals under 51.308(f)(3), the EPA is also proposing to disapprove the State's FLM consultation under 51.308(i). While Wyoming did take administrative steps to provide the FLMs the opportunity to review and provide feedback on the State's draft regional haze plan, the EPA cannot approve that consultation because it was based on a plan that does not meet the statutory and regulatory requirements of the CAA and the RHR, as described throughout this document. In addition, if the EPA finalizes our proposed partial approval and partial disapproval of Wyoming's SIP submission, the State (or the EPA in the potential case of a FIP) will be required to again complete the FLM consultation requirements under 40 CFR 51.308(i). Therefore, the EPA proposes to disapprove the FLM consultation component of Wyoming's SIP submission for failure to meet the requirements of 40 CFR 51.308(i), as outlined in this section.

V. Proposed Action

The EPA is proposing approval of the portions of Wyoming's 2022 SIP submission relating to 40 CFR 51.308(f)(1): calculations of baseline, current, and natural visibility conditions, progress to date, and the uniform rate of progress; 40 CFR 51.308(f)(4): reasonably attributable visibility impairment; 40 CFR 51.308(f)(5): progress report requirements; and 40 CFR 51.308(f)(6): monitoring strategy and other implementation plan requirements. The EPA is proposing disapproval of the remainder of Wyoming's 2022 SIP submission, which addresses 40 CFR 51.308(f)(2): long-term strategy; 40 CFR

51.308(f)(3): reasonable progress goals; and 40 CFR 51.308(i): FLM consultation.

VI. Environmental Justice

The EPA conducted an environmental justice (EJ) screening analysis around the location of the facilities associated with Wyoming's 2022 SIP submission to identify potential environmental stressors on these communities. The EPA is providing the information associated with this analysis for informational purposes only; it does not form any part of the basis of this proposed action. The EPA conducted the screening analyses using EJScreen, an environmental justice mapping and screening tool that provides the EPA with a nationally consistent dataset and approach for combining various environmental and demographic indicators.¹⁹⁶

The EPA prepared EJScreen reports covering buffer areas of approximately six miles around the twelve facilities selected for four-factor analysis in Wyoming's 2022 SIP submission.¹⁹⁷ From those reports, no facilities showed environmental justice indices greater than the 80th national percentiles.¹⁹⁸ The full, detailed EJScreen reports are provided in the docket for this rulemaking.

VII. 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, the EPA's role is to approve state choices, provided that they meet the criteria of the CAA. Accordingly, this action merely proposes to partially approve and partially disapprove the state's SIP submission as meeting federal requirements and 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 Orders 12866 (58 FR 51735, October 4, 1993) and 13563 (76 FR 3821, January 21, 2011);
- Does not impose an information collection burden under the provisions

¹⁹⁶ The EJSCREEN tool is available at <https://www.epa.gov/ejscreen>.

¹⁹⁷ See EJScreens in docket.

¹⁹⁸ This means that 20 percent of the U.S. population has a higher value. The EPA identified the 80th percentile filter as an initial starting point for interpreting EJScreen results. The use of an initial filter promotes consistency for the EPA's programs and regions when interpreting screening results.

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 (Pub. L. 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

In addition, the SIP is not approved to apply on any Indian reservation land or in any other area where EPA or an Indian tribe has demonstrated that a tribe has jurisdiction. In those areas of Indian country, the proposed rule does not have tribal implications and will not impose substantial direct costs on tribal governments or preempt tribal law as specified by Executive Order 13175 (65 FR 67249, November 9, 2000).

Executive Order 12898 (Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, 59 FR 7629, Feb. 16, 1994) directs Federal agencies to identify and address "disproportionately high and adverse human health or environmental effects" of their actions on minority populations and low-income populations to the greatest extent practicable and permitted by law. EPA defines environmental justice (EJ) as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." EPA further defines the term fair treatment to mean that "no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies."

¹⁹³ Wyoming 2022 SIP submission at 25-26.

¹⁹⁴ Wyoming 2022 SIP submission at appendix M.

¹⁹⁵ Wyoming 2022 SIP submission at 26-27.

Wyoming did not evaluate environmental justice considerations as part of its SIP submission; the CAA and applicable implementing regulations neither prohibit nor require such an evaluation. The EPA performed an environmental justice screening analysis, as described previously in section VI. Environmental Justice. The analysis was done for the purpose of providing additional context and information about this rulemaking to the

public, not as a basis of the action. There is no information in the record upon which this decision is based inconsistent with the stated goal of E.O. 12898 of achieving environmental justice for people of color, low-income populations, and Indigenous peoples.

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Carbon monoxide, Greenhouse gases, Incorporation by

reference, Intergovernmental relations, Lead, Nitrogen dioxide, Ozone, Particulate matter, Reporting and recordkeeping requirements, Sulfur oxides, Volatile organic compounds.

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

Dated: July 24, 2024.

KC Becker,

Regional Administrator, Region 8.

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