



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

July 8, 2021

MEMORANDUM

SUBJECT: Clarifications Regarding Regional Haze State Implementation Plans for the Second Implementation Period

FROM: Peter Tsirigotis
Director

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TO: Regional Air Division Directors, Regions 1-10

This memorandum provides information on the Regional Haze second planning period in light of questions and information the Environmental Protection Agency (EPA) is receiving regarding State Implementation Plan (SIP) development. The purpose is to share more broadly the types of issues in draft SIPs being raised from EPA Regions and from other stakeholders and to offer feedback more broadly to help support SIP development, submittal, review, and action for the second planning period (also referred to as the second implementation period). The memorandum provides a good balance of flexibility and accountability for states and sources to ensure that the regional haze program will continue to improve visibility in our national parks and wilderness areas.

EPA promulgated revisions to the Regional Haze Rule (RHR) in 2017¹ and in August 2019 issued *Guidance on Regional Haze State Implementation Plans for the Second Implementation Period* (August 2019 Guidance or Guidance).² Since that time, air agencies and other stakeholders including industry, conservation organizations, and Federal Land Managers (FLMs) have raised various questions regarding RHR requirements as part of their SIP development for the second planning period. EPA recognizes and appreciates the work of all stakeholders in developing and providing feedback on SIPs so far. With the July 31, 2021, SIP deadline rapidly approaching, some states have already submitted final SIPs to EPA; some are undergoing public notice and comment processes at the state level, as well as other types of engagement; and some are still in the development phase. This memorandum highlights key aspects of the RHR and August 2019 Guidance in the context of questions and information shared from states and EPA Regional offices during SIP development.

¹ "Protection of Visibility: Amendments to Requirements for State Plans," 82 FR 3078 (January 10, 2017).

² Available at https://www.epa.gov/sites/production/files/2019-08/documents/8-20-2019_-_regional_haze_guidance_final_guidance.pdf.

EPA is committed to supporting state efforts to develop SIPs that comply with the Clean Air Act (CAA) and RHR as we work together in partnership to prevent any future, and remedy any existing, impairment of visibility in mandatory Class I Federal areas – America’s treasured national parks and wilderness areas. EPA intends the second planning period of the regional haze program to secure meaningful reductions in visibility impairing pollutants that build on the significant progress states have already achieved. There exist many opportunities for states to leverage both ongoing and upcoming emission reductions under other CAA programs; however, we also expect states to undertake rigorous reasonable progress analyses that identify further opportunities to advance the national visibility goal consistent with the statutory and regulatory requirements.

This memorandum does not change or substitute for provisions or requirements of the CAA or RHR, nor does it create any new requirements. Rather, this memorandum clarifies and provides further information on the existing statutory and regulatory requirements. EPA evaluates and acts on states’ SIP submissions on a case-by-case basis. The Agency reviews each submission against the applicable requirements; the Agency’s approval or disapproval of a state’s submission is subject to judicial review in the appropriate U.S. Circuit Court of Appeal pursuant to CAA section 307(b)(1). This memorandum does not constitute or prejudge EPA action on any state’s submission but rather clarifies our interpretation of the applicable statutory and regulatory requirements against which submissions will be evaluated in subsequent, separate actions.

Non-mandatory language such as “guidance,” “recommend,” and “may” in this memorandum is intended to describe EPA’s non-binding recommendations, while mandatory terminology such as “must,” “required,” and “may not” is intended to describe legal requirements under the CAA or EPA regulations. Neither such language nor anything else in this memorandum is intended to or does establish legally binding requirements in and of itself, and no part of this memorandum has legally binding effect or represents the consummation of Agency decision making. It is, therefore, not a final agency action and is not judicially reviewable.

1. Background

The regulatory requirements for states’ second planning period SIPs are codified at 40 CFR 51.308(f). The August 2019 Guidance provides a suggested process for meeting these requirements and outlines eight key regional haze SIP development steps.³ This memorandum addresses specific issues related to several of these steps in response to stakeholder questions and issues arising in draft SIPs. Specifically, Section 2 of this memorandum discusses source selection, Section 3 discusses characterization of factors for emission control measures, and Section 4 discusses decisions on what control measures are necessary to make reasonable progress. Section 5 discusses topics that span multiple steps in the Guidance: consideration of visibility in making control determinations, consideration of the five additional factors, characterizing visibility impacts and benefits, use of the uniform rate of progress (URP) is not a safe harbor, the contents of the long-term strategy, setting of reasonable progress goals (RPGs), and environmental justice.

³ See August 2019 Guidance at 5-6.

2. Selection of Sources for Analysis

In reviewing draft SIPs, EPA has observed that states are applying an array of source selection methods and are, in some instances, relying on multi-state evaluations. In this context, multi-state or regional evaluations involve consideration of sources across more than one state and rank those sources based on their relative visibility impact. Based on these initial SIP reviews, this section reiterates key aspects of source selection in order to support Regional offices in working collaboratively with states on this issue. Consistent with RHR section 51.08(f)(2)(i), SIPs must include a description of the criteria the state used to determine the sources or groups of sources it evaluated for controls that may be necessary to make reasonable progress. “Step 3” of the August 2019 Guidance describes the process by which states determine, or select, sources for subsequent control analysis using the four statutory factors in CAA section 169A(g)(1). Source selection is a critical step in states’ analytical processes. All subsequent determinations of what constitutes reasonable progress flow from states’ initial decisions regarding the universe of pollutants and sources they will consider for the second planning period. States cannot reasonably determine that they are making reasonable progress if they have not adequately considered the contributors to visibility impairment. Thus, while states have discretion to reasonably select sources, this analysis 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.

2.1. Factors to Consider for Source Selection

While reviewing draft regional haze SIPs, EPA has found that some rely on source selection methodologies that result in selection of the largest regional contributors to visibility impairment across multiple states. While this approach may be permissible in some cases, it may not be reasonable for a particular state if it results in few or no sources in that state being selected. Under the RHR, each state has an obligation to submit a long-term strategy that addresses the regional haze visibility impairment resulting from emissions from within that state.⁴ This obligation is not discharged simply because another state’s contributions to visibility impairment may be greater.

States have discretion to choose any source selection threshold or methodology that is reasonable; however, whatever choices states make should be reasonably explained and produce a reasonable outcome. The RHR does not explicitly list factors that states must or may not consider when selecting sources for analysis, but the August 2019 Guidance identifies several factors that states may consider. A state that relies on a visibility (or proxy for visibility impact) threshold to select sources for four-factor analysis should set the threshold at a level that captures a meaningful portion of the state’s total contribution to visibility impairment to Class I areas. In applying a source selection methodology, states should focus on the in-state contribution to visibility impairment and not decline to select sources based on the fact that there are larger out-of-state contributors. What is reasonable will depend on the specific circumstances. We generally think that a threshold that captures only a small portion of a state’s contribution to visibility impairment in Class I areas is more likely to be unreasonable. Similarly, a threshold that excludes a state’s largest visibility impairing sources from selection is more likely to be unreasonable.

⁴ See 40 CFR 51.308(f)(2).

The 2017 RHR recognized that, due to the nature of regional haze (visibility impairment that is caused by the emissions of air pollutants from numerous anthropogenic sources located over a wide geographic area), numerous and sometimes (relatively) smaller in-state sources may need to be selected and evaluated for control measures as part of the reasonable progress analysis. As stated in response to comments on the 2017 RHR, “[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.”⁵ In a source-selection process that relies on multi-state rankings of sources, impacts from large out-of-state sources can exceed the contributions from relatively smaller, but still important in-state sources. States should not use that fact to ignore selecting the largest in-state sources. In general, states with larger sources that contribute more to visibility impairment should select more sources, and states with relatively small sources compared to their neighbors should nonetheless select their largest in-state sources.

As an example, and purely for purposes of illustration, a 2,500 tons per year (tpy) source may not be considered “high impact” by some states depending on state-specific circumstances or as compared to a 25,000 tpy source in a nearby state. However, a state should still select the 2,500 tpy source if it is among the largest sources of visibility impairment in the state. Importantly, the numbers are offered as an illustration and should not be construed as broadly applicable thresholds for source selection; the appropriate threshold for a state to use will generally depend on the sources in each state. Moreover, we are not suggesting that states should select sources that have inarguably negligible impacts on visibility. Additionally, states should be consistent in their source selection. Absent a persuasive reason, a state should not select some sources for analysis but decline to select other, similarly situated sources (*e.g.*, in terms of emissions, visibility impacts, feasibility of controls). EPA anticipates that this overall approach would be consistent with the RHR and the CAA.

Finally, given the interstate nature of regional haze, other states that also contribute at a given Class I area and FLMs play important roles in addressing visibility impairment. Pursuant to the RHR, states must, therefore, consider selecting sources identified by other states⁶ or by FLMs.⁷ A state receiving a request to select a particular source(s) should either perform a four-factor analysis on the source(s) or provide a well-reasoned explanation as to why it is choosing not to do so.⁸

2.2. Pollutants Considered for Source Selection and Control Strategy Analysis

Consistent with the first planning period, EPA generally expects that each state will analyze sulfur dioxide (SO₂) and nitrogen oxide (NO_x) in selecting sources and determining control measures.⁹ In nearly all Class I areas, the largest particulate matter (PM) components of anthropogenic visibility impairment are sulfate and nitrate, caused primarily by PM precursors SO₂ and NO_x, respectively. A state that chooses not to consider at least these two pollutants in the

⁵ Responses to Comments on Protection of Visibility: Amendments to Requirements for States Plans; Proposed Rule (81 FR 26942, May 4, 2016) at 87-88, available at <https://www.regulations.gov/document/EPA-HQ-OAR-2015-0531-0635>.

⁶ See 40 CFR 51.308(f)(2)(ii).

⁷ See 40 CFR 51.308(i)(2)-(3).

⁸ See 40 CFR 51.308(f)(2)(ii), (i)(2)-(3).

⁹ See August 2019 Guidance at 12.

second planning period should show why such consideration would be unreasonable, especially if the state considered both these pollutants in the first planning period. Regional offices are encouraged to work closely with states to ensure the bases for their decisions are sufficiently developed to demonstrate a reasonable analysis.

2.3. Sources that are Not Selected Based on Existing Effective Controls

The August 2019 Guidance provides that a source that otherwise would undergo four-factor analysis (*e.g.*, because it exceeds a threshold of emissions divided by distance or Q/d, visibility, or other source-selection threshold) may forgo a full four-factor analysis if it is already “effectively controlled.”¹⁰ While this flexibility has the potential to streamline states’ planning processes, states that identify “effectively controlled” sources need to explain why it is reasonable to assume that a four-factor analysis would likely result in the conclusion that no further controls are reasonable.

The underlying rationale for the “effective controls” flexibility is that if a source’s emissions are already well controlled, it is unlikely that further cost-effective reductions are available. A state relying on an “effective control” to avoid performing a four-factor analysis for a source should demonstrate why, for that source specifically, a four-factor analysis would not result in new controls and would, therefore, be a futile exercise. States should first assess whether the source in question already operates an “effective control” as described in the August 2019 Guidance.¹¹ They should further consider information specific to the source, including recent actual and projected emission rates, to determine if the source could reasonably attain a lower rate. It may be difficult for a state to demonstrate that a four-factor analysis is futile for a source just because it has an “effective control” if it has recently operated at a significantly lower emission rate. In that case, a four-factor analysis may identify a lower emission rate (*e.g.*, associated with more efficient use of the “effective existing controls”) that may be reasonable and thus necessary for reasonable progress. If a source can achieve, or is achieving, a lower emission rate using its existing measures than the rate assumed for the “effective control,” a state should further analyze the lower emission rate(s) as a potential control option.

2.4. States that Select No Sources for Four-Factor Analysis

EPA has noted that multiple draft regional haze SIPs selected no sources for four-factor analysis. Although the August 2019 Guidance implied that there may be circumstances in which this might be reasonable,¹² we expect such circumstances to be rare given that anthropogenic visibility impairment remains in all Class I areas and that all states contains sources of visibility impairing pollutants.¹³ We reiterate that a state that brings no sources forward for analysis of

¹⁰ See August 2019 Guidance at 22-25.

¹¹ *Id.*

¹² See August 2019 Guidance at 10.

¹³ *Cf.* “Approval and Promulgation of Air Quality Implementation Plans; District of Columbia; Regional Haze State Implementation Plan for the Second Implementation Period and Reasonably Available Control Technology for Major Stationary Sources of Nitrogen Oxides; Technical Amendment,” 86 FR 1793, 19805-07 (April 15, 2021) (explaining that EPA proposed to find the District of Columbia’s decision to not conduct four-factor analyses for any sources reasonable because, *inter alia*, the District does not contain any point sources with large emissions of visibility impairing pollutants and the largest point source is already effectively controlled).

control measures must explain how doing so is consistent with the statutory and regulatory requirements for SIPs to contain the measures necessary to make reasonable progress. In this case, the state is not merely asserting that its sources need no further controls to make reasonable progress, but that even identifying sources to analyze is a futile exercise because it is obvious that a four-factor analysis would not result in any new controls. Bringing no sources forward for source selection without a thoroughly justified explanation of why it is reasonable to forgo a four-factor analysis is inconsistent with the statutory and regulatory requirements because, as discussed in Section 3, the determination of reasonable progress is based on the consideration of the four statutory factors.

3. Characterization of Factors for Emission Control Measures

States must evaluate and determine the emission reduction measures, or controls, for selected sources that are necessary to make reasonable progress by considering the four statutory factors (costs of compliance, time necessary for compliance, energy and non-air quality environmental impacts of compliance, and the remaining useful life of any existing source).¹⁴ That is, a state must apply the four factors to its selected sources, either individually or as a group. In light of our review of draft SIPs and questions from states, we are sharing feedback here regarding three key aspects of the four-factor analysis: the structure of the reasonable progress analysis; what control options states should consider in a reasonable four-factor analysis; and what constitutes a reasonable grouping of sources for four-factor analysis.

3.1. Relationship Between Four-Factor Analysis, Long-Term Strategy, and Reasonable Progress Goals

Over the course of recent discussions with states and stakeholders, we have realized that there is still some confusion regarding the relationship between the four-factor analysis, the long-term strategy, and RPGs. We are, therefore, reiterating our explanation from the 2017 RHR revisions that the four statutory factors are used to determine the emission reduction measures that are necessary to make reasonable progress and must, therefore, be included in a state's long-term strategy.¹⁵ Reasonable progress towards natural visibility conditions at any particular Class I area is achieved when all contributing states are implementing the measures in their long-term strategies. RPGs are the modeled result of the measures in states' long-term strategies, as well as other measures required under the CAA (that have compliance dates on or before the end of 2028).¹⁶ RPGs cannot be determined before states have conducted their four-factor analyses and determined the control measures that are necessary to make reasonable progress.¹⁷

¹⁴ 40 CFR 51.308(f)(2)(i).

¹⁵ 40 CFR 51.308(f)(2)(i), (f)(2); *see also* 82 FR at 3090-96.

¹⁶ 40 CFR 51.308(f)(3).

¹⁷ The August 2019 Guidance allows for the possibility of post-modeling adjustments to the RPGs to account for the fact that final long-term strategy decisions for the state or for other states may not be known until late in the process, or even after SIPs are submitted. *See* August 2019 Guidance at 46-48. *See also*, 82 FR 3078, 3080 (January 10, 2017).

3.2. Control Options for Four-Factor Analysis

We are providing additional feedback about the control measures that states should include in four-factor analyses for their sources. The four factors are used to assess and choose between emission reduction measures for sources of visibility impairing pollutants. A reasonable four-factor analysis will consider the full range of potentially reasonable options for reducing emissions. The August 2019 Guidance lists examples of different types of control measures that states may consider in their four-factor analyses for sources.¹⁸ In addition to add-on controls and other retrofits, the Guidance also lists emission reductions through improved work practices; upgrades or replacements for existing, less effective controls; and year-round operation of existing controls.

Similarly, in some cases, states may be able to achieve greater control efficiencies, and, therefore, lower emission rates, using their existing measures. Considering efficiency improvements for an existing control (*e.g.*, using additional reagent to increase the efficiency of an existing scrubber) as a potential measure is generally reasonable since in many cases such improvements may only involve additional operation and maintenance costs. States should generally include efficiency improvements for sources' existing measures as control options in their four-factor analyses in addition to other types of emission reduction measures. In rare instances, increasing the efficiency of a control measure might result in adverse energy or non-air quality environmental impacts. If this is the case, such impacts should generally be addressed in the context of a four-factor analysis, rather than be used as a reason to not analyze increased efficiency of the measure in the first instance. We generally expect that most adverse energy and non-air quality environmental impacts of compliance are best assessed as part of the cost-effectiveness calculation; only in unusual circumstances do we anticipate that such impacts will preclude selection of an otherwise cost-effective control.

In addition to efficiency improvements, as part of a four-factor analysis states should consider recent actual and projected emission rates to determine if the source could otherwise reasonably attain a lower rate with its existing measures. This is especially important when a source has already achieved or is achieving a lower emission rate using its existing measures than the rate assumed in the baseline for its four-factor analysis. That is, a state might have assumed a conservatively high baseline emission rate for a source in its four-factor analysis, but the source has actually achieved, either currently or in recent years, a lower rate through status quo implementation of its existing measures. In this case, we expect the state to at least analyze the lower rate as a potential control option. It would be difficult for a state to demonstrate that there are no cost-effective emission reductions available for a source that has recently operated at significantly lower emission rates compared to the four-factor analysis baseline. That is, a four-factor analysis may identify a lower emission rate that may be necessary for reasonable progress.

3.3. Reasonable Grouping of Sources for Four-Factor Analysis

We also are clarifying that, although states have flexibility to consider the four factors for groups of sources, 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

¹⁸ See August 2019 Guidance at 29-30.

be quantified for those sources or subgroups, then states should make a separate reasonable progress determination for each source or subgroup. For example, where a control measure is highly cost effective, results in large emissions reductions, and is identified as important for addressing visibility impairment by virtue of a source having been selected for four-factor analysis, the state should generally not reject that control by grouping the source together with other sources without similarly reasonable controls and then claiming that no controls should be required across the entire group. If the control is reasonable for the source, the state should generally require it.

4. Decisions on What Control Measures are Necessary to Make Reasonable Progress

EPA has received multiple questions from states and stakeholders asking what to do when a four-factor analysis concludes that no new emission control measures are reasonable for a source. The August 2019 Guidance addresses how, once a state has characterized the four statutory factors for the selected sources, it makes decisions on what emission control measures are necessary to make reasonable progress for the second planning period.¹⁹ If four-factor analyses evaluate a reasonable range of potential control options, we anticipate that in many cases states will find that new (*i.e.*, additional) measures are necessary to make reasonable progress. All new measures must be included in the SIP.²⁰

However, there may be other cases where, after having conducted robust source selection and rigorous analysis of the four factors, states have not identified any new measures that are reasonable to require for a source. In such cases, states will have to address whether the source's existing measures are necessary to make reasonable progress. The August 2019 Guidance provides that, “[i]f a state determines that an in-place emission control at a source is a measure that is necessary to make reasonable progress and there is not already an enforceable emission limit corresponding to that control in the SIP, the state is required to adopt emission limits based on those controls as part of its long-term strategy in the SIP via the regional haze second planning period plan submission.”²¹

4.1. Determining When Existing Measures are Necessary for Reasonable Progress

States and stakeholders have raised a number of questions related to determining when in-place (*i.e.*, “existing”) measures at a source are necessary for reasonable progress. The four-factor analysis is used to determine the emission control measures that are necessary to make reasonable progress towards the national visibility goal. That goal has two prongs: the prevention of any future anthropogenic visibility impairment and the remedying of any existing anthropogenic visibility impairment.²² Existing visibility impairment is remedied by reducing emissions from existing sources. Future visibility impairment is prevented by mitigating impacts from new sources and ensuring that existing sources do not increase their emissions in a manner inconsistent with reasonable progress. Thus, when the outcome of a four-factor analysis is a new measure, that measure is needed to remedy existing visibility impairment and is necessary to make reasonable progress. When the outcome of a four-factor analysis is that no new measures are reasonable for a

¹⁹ See August 2019 Guidance at 36-45.

²⁰ CAA 169A(b)(2); 40 CFR 51.308(f)(2).

²¹ August 2019 Guidance at 43.

²² See CAA section 169A(a)(1).

source, the source's existing measures are generally needed to prevent future visibility impairment (*i.e.*, to prevent future emission increases) and thus necessary to make reasonable progress. Measures that are necessary to make reasonable progress must be included in the SIP.

However, there may be circumstances in which 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 emission rate, it may not be necessary to require those measures under the regional haze program in order to prevent future emission increases. In this case, a state may reasonably conclude that a source's existing measures are not necessary to make reasonable progress and thus do not need to be included in the SIP. A determination that a source's existing measures are not necessary to make reasonable progress should be supported by a robust technical demonstration. This empirical, weight-of-evidence demonstration should be based on data and information on (1) the source's past implementation of its existing measures and its historical emission rate, (2) the source's projected emissions and emission rate, and (3) any enforceable emissions limits or other requirements related to the source's existing measures.

Information on a source's past performance using its existing measures may help to inform the expected future operation of that source. If either a source's implementation of its existing measures or the emission rate achieved using those measures has not been consistent in the past, it is not reasonable to assume that the source's emission rate will remain consistent and will not increase in the future. To this end, states should include data for a representative historical period demonstrating that the source has consistently implemented its existing measures and has achieved, using those measures, a reasonably consistent emission rate.²³ For most sources, data from the most recent 5 years (if available) is sufficient to make this showing. Information pertinent to a source's implementation of its existing measures going forward is also critical to a state's demonstration. States should provide data and information on the source's projected emission rate (*e.g.*, for 2028), including assumptions and inputs to those projections. States should justify those assumptions and inputs and explain why it is reasonable to expect that the source's emission rate will not increase in the future.

The existence of an enforceable emission limit or other enforceable requirement (*e.g.*, a work practice standard or operational limit) reflecting a source's existing measures may also be evidence that the source will continue implementing those measures. A federally enforceable and permanent requirement provides the greatest certainty and, therefore, is the preferred and best evidence. EPA will consider these and other types of limits and operational requirements as part of its weight-of-evidence evaluation. To be relevant, the limit should reflect the emission rate the source is actually achieving with its existing measures. A limit that is significantly higher than the emission rate a source is actually achieving does not keep the source from increasing its rate in the future. States should provide information on any enforceable emission limits associated with sources' existing measures. States should also clearly identify the instrument in which the relevant limit(s) exist (by providing, *e.g.*, the applicable permit number and where it can be found) and

²³ The information on emission rates should be representative of the typical averaging time of enforceable limits for the source. Typical averaging times for regional haze SIP measures are 30-day rolling averages or 30-day boiler operating day averages, but could also be shorter-term averages, (*e.g.*, pounds/hour) or may be expressed in different units (*e.g.*, pounds/ton of product produced).

provide information on the specific permit provision(s) on which they are relying. If the instrument is not publicly available or readily accessible, a state should provide a copy of the instrument to EPA with its SIP submission.

States may also provide any additional information they believe demonstrates that a source will continue to implement its existing measures and that its emission rate will not increase in the future. EPA will evaluate states' demonstrations to determine if they adequately support a determination that a source's existing measures are not necessary to make reasonable progress.

4.2. Existing Effective Controls

As noted in Section 2.3, states may rely on "existing effective controls" to not select a source for a full four-factor analysis. In determining whether such controls are necessary to make reasonable progress, states should follow the same approach as for existing measures. A decision to forgo a full four-factor analysis based on a source's existing effective controls is equivalent to a determination that no new measures are necessary to make reasonable progress. In this scenario, existing effective controls are, therefore, generally necessary to make reasonable progress and thus must be adopted into the regulatory portion of the SIP. However, the state may provide a weight-of-evidence demonstration as described in Section 4.1 to justify that the existing effective control is not necessary for reasonable progress.

4.3. "On-the-Way" Measures and Shutdowns

States and stakeholders have also asked about how to treat so-called "on-the way" measures. Generally, on-the-way measures include situations in which measures have not yet been implemented and the associated emissions reductions have not yet occurred as of the SIP submission date. If a state is relying on an on-the-way measure to achieve future emission reductions that are needed to remedy existing visibility impairment, that measure is necessary to make reasonable progress. Anticipated source shutdowns could be considered the most stringent on-the-way measure,²⁴ and may be relied upon to forgo a four-factor analysis or shorten the remaining useful life of a source.²⁵ In general, there is less certainty that a future control measure or shutdown will be implemented and permanent, or that it will actually achieve the emission reductions that are necessary to make reasonable progress. Therefore, on-the-way measures, including anticipated shutdowns that are relied on to forgo a four-factor analysis or to shorten the remaining useful life of a source, are necessary to make reasonable progress and must be included in a SIP.

²⁴ The August 2019 Guidance provides two ways in which states may rely on anticipated shutdowns in the reasonable progress analysis: to forgo conducting a four-factor analysis for a source or to shorten the remaining useful life of a source for the purpose of a four-factor analysis. See August 2019 Guidance at 20 and 34, respectively.

²⁵ See August 2019 Guidance at 20, 34.

4.4. Ongoing Evaluation of the Adequacy of Existing Measures

A state's determination that an existing measure is not necessary to make reasonable progress depends on a well-supported demonstration about the future implementation of that measure. EPA anticipates conducting robust evaluations of these determinations not only when acting on the SIP submission, but also as the planning period moves forward.

There are several available tools for states and EPA to report and track emissions. First, the RHR contains a mechanism for states and EPA to evaluate whether existing SIP-based emissions limits are sufficient to achieve reasonable progress. States are required to submit periodic reports describing their progress towards the reasonable progress goals for each Class I area within the state and each Class I area outside the state that may be affected by emissions from within the state. For the second planning period, states' progress reports are due January 31, 2025.²⁶ As part of this report, states must assess whether their SIPs contain adequate enforceable emission limitations and other elements to ensure that their sources will achieve reasonable progress the second planning period. Additionally, 40 CFR 51.308(h) requires states, at the same time they submit their progress reports, to determine whether their SIPs are adequate to ensure reasonable progress. If a state determines that its SIP is inadequate to ensure reasonable progress due to emissions from sources within the state, the RHR requires that state to revise its SIP within 1 year to address the deficiencies.²⁷

EPA expects to use states' progress reports, and the assessments required under 40 CFR 51.308(g)(6) and determinations under 40 CFR 51.308(h) in particular, as a check on whether sources are continuing to implement any existing measures a state determined were not necessary to make reasonable progress and, therefore, not required under the regional haze program. In addition, sources are required to report emissions data on an ongoing basis under several EPA programs, such as the Air Emissions Reporting Rule (40 CFR Appendix A to Part 51) and Continuous Emissions Monitoring (40 CFR Part 75). If at any point a source's emission rate increases to an extent that its existing SIP is inadequate to ensure reasonable progress, EPA has the authority to address such a scenario (*e.g.*, under CAA sections 110(k)(5) and (6)).

4.5. Form of Emission Limit

EPA has received several questions from states and stakeholders about establishing emission limits, with a specific focus on existing measures that are necessary to make reasonable progress and must be included in the SIP. This section provides feedback on what SIP-based emission limits, whether for new or existing measures, should reflect. In general, an emission limit reflecting a source's existing measures that are necessary to make reasonable progress should be in the form of the emission rate achieved when implementing those measures (*e.g.*, pounds per million British thermal units or lbs/MMBtu, pounds per hour or lbs/hr, or pounds per ton or lbs/ton of produced material). For either a new or existing measure, states will have considered a specific emissions rate that can be achieved through implementation of that measure.²⁸ We, therefore,

²⁶ 40 CFR 51.308(g).

²⁷ 40 CFR 51.308(h)(4).

²⁸ As explained in section 3.2, if a source is able to achieve a lower emissions rate using its existing measure than the rate assumed in the baseline for its four-factor analysis, the state should consider that lower emissions rate as a potential control option.

expect that when a state that has determined a source's existing measures are necessary to make reasonable progress, it will effectively have determined that implementation of those measures *to achieve a particular emission rate* is necessary to make reasonable progress. The SIP-based emission limit for that source should correspond to the emission rate that was determined to be necessary to make reasonable progress.

Additionally, for the purpose of a four-factor analysis for a particular source, a state may have assumed significantly lower baseline emissions (total emissions by mass) due to a projected reduction in utilization or production. This issue has come up in some SIPs and has implications for both new and existing measures. As explained in the August 2019 Guidance, reasonable bases for projecting that future emissions will be significantly different than past emissions are enforceable requirements and energy efficiency, renewable energy, or other similar programs, where there is a documented commitment to participate and a verifiable basis for quantifying changes in future emissions. However, in some cases states may have projected significantly lower total emissions due to unenforceable utilization or production assumptions and those projections are dispositive of the four-factor analysis. For example, a state that rejected new controls solely based on cost effectiveness values that were higher due to low utilization assumptions. In this circumstance, an emission limit that requires compliance with only an emission rate may not be able to reasonably ensure that the source's future emissions will be consistent with the assumptions relied upon for the reasonable progress determination. EPA anticipates these circumstances will be rare. One option a state may consider in this case is to incorporate a utilization or production limit corresponding to the assumption in the four-factor analysis into the SIP. Although not required, this approach is one way for states to address circumstances in which a specific emission rate does not, by itself, represent the reasonable progress determination. That is, EPA would not require a state to lock-in the exact emission levels (tons of pollutant) a source assumed for the purpose of its four-factor analysis or the 2028 projected emission levels (tons of pollutant) assumed in air quality modeling analyses. An alternative approach would be to perform the four-factor analysis using recent historical utilization or production levels as the baseline. A revised four-factor analysis may show that cost-effective controls are available at the source's current or recent historical utilization or production.

5. Additional Issues Related to Assessing Control Measures

This section discusses the following additional issues, which span multiple steps as laid out in the August 2019 Guidance:

- Additional factors to evaluate emission controls (including visibility and the five "additional factors" listed in the RHR)
- Characterizing visibility impacts and benefits
- URP is not a safe harbor
- Contents of the long-term strategy and setting of RPGs
- Environmental justice considerations

5.1. Visibility as an Additional Factor

EPA has interpreted the CAA and RHR as allowing states to consider visibility alongside the four statutory factors when determining the emission reduction measures that are necessary to make reasonable progress. We have explained that:

While the CAA lists the four reasonable progress factors, it is silent as to whether states or the EPA may consider other, additional factors. This final rule neither requires nor prohibits states from considering visibility when making reasonable progress determinations. . . . However, a state that elects to consider an additional factor such as visibility benefit must consider it in a reasonable way that does not undermine or nullify the role of the four statutory factors in determining what controls are necessary to make reasonable progress.²⁹

Specifically, a state should not use visibility to summarily dismiss cost-effective potential controls. However, visibility benefits can be used alongside the four statutory factors when comparing multiple emission control options. For instance, the approach taken for Best Available Retrofit Technology (BART) determinations in the first planning period could be used as a model.³⁰ That is, for a source with multiple cost-effective controls, a state may balance visibility with cost effectiveness and other statutory factors in selecting a reasonable control. Another potentially reasonable approach might be for a state that identifies cost-effective new controls at a multitude of sources to choose to require controls at only a subset of those sources that constitute the vast majority of the visibility benefit. In this case, the state could rely on visibility benefits to prioritize which sources would receive new controls. By contrast, a state that has identified cost-effective controls for its sources but rejects most (or all) such cost-effective controls across those sources based on visibility benefits is likely to be improperly using visibility as an additional factor.

5.2. Consideration of the Five “Additional Factors”

We are aware that some states are using the five additional regulatory factors, in particular 40 CFR 51.308(f)(2)(iv)(A) and (E), to reject controls that are otherwise reasonable based on the four statutory factors. In the August 2019 Guidance, EPA provided that states may consider the five “additional factors” in section 51.308(f)(2)(iv) in making their emission control determinations.³¹ However, 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. More broadly, we do not think a state should rely on these two 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. Doing so would be similar in principle as relying on URP as a safe harbor, which we have consistently stated does not comport with the RHR, as noted in Section 5.4. We do think states can consider these factors in a more tailored manner, for instance in choosing between multiple control options when all are reasonable based on the four statutory factors.

²⁹ Response to Comments on Protection of Visibility: Amendments to Requirements for State Plans; Proposed Rule at 186.

³⁰ See 40 CFR 51.308(e)(1)(ii)(A).

³¹ See August 2019 Guidance at 21.

5.3. Characterizing Visibility Impacts/Benefits

We have observed that some draft SIPs are using modeled visibility benefits to justify rejecting otherwise cost-effective control measures. It is important that, where applicable, each state considers the magnitude of modeled visibility impacts or benefits³² in the context of its own contribution to visibility impairment. That is, whether a particular visibility impact or change is “meaningful” should be assessed in the context of the individual state’s contribution to visibility impairment, rather than total impairment at a Class I area. As stated in the RHR preamble:

Regional haze is visibility impairment that is caused by the emission of air pollutants from numerous sources located over a wide geographic area. At any given Class I area, hundreds or even thousands of individual sources may contribute to regional haze. Thus, it would not be appropriate for a state to reject a control measure (or measures) because its effect on the RPG is subjectively assessed as not “meaningful.”³³

EPA recognizes the significant improvements in visibility that have already occurred in most Class I areas but notes that additional progress is needed to achieve the national goal set by Congress. Evaluation of control measures for relatively smaller sources (with commensurate smaller visibility benefits from each individual source) will be needed to continue making reasonable progress towards the national goal. This is true for the second planning period, as many of the largest individual visibility impairing sources have either already been controlled (under the RHR or other CAA or state programs) or have retired. To this end, EPA is reiterating that visibility thresholds used for BART and other analyses in the first planning period (*e.g.*, 0.5 deciviews) are, in most cases, not appropriate thresholds for selecting sources or evaluating the impact of controls for reasonable progress in the second planning period. This is the case for several reasons.

First, regional haze is caused by hundreds or thousands of individual sources and very few remaining sources (or even none of them) will individually have impacts as large as 0.5 deciviews or some other threshold that might be considered a “perceptible” or “meaningful” impact. However, these sources still contribute to visibility impairment and have a meaningful impact in the aggregate. Second, the magnitude of the previously recommended subject-to-BART threshold (0.5 deciviews) was closely tied to the specific modeling tools and metrics recommended in the BART Guidelines,³⁴ as well as to the purpose and structure of the BART provisions.³⁵ For the second planning period, most states that are both establishing RPGs and (where applicable) evaluating individual source or sector visibility impacts, are using photochemical models with a focus on visibility impacts averaged over the 20 percent most impaired days at each Class I area. The difference in technical tools as well as emissions assumptions and impact metrics make any comparison of the modeling for the second planning period to the previous BART modeling an “apples-to-oranges” analysis.

³² As explained in the August 2019 Guidance, modeled visibility impacts can be expressed in either inverse megameters (Mm^{-1}) or deciviews (dv). However, if visibility impacts are expressed in deciviews, the value should be calculated relative to natural conditions. *See* August 2019 Guidance page 16 and footnotes 36, 37, and 38.

³³ 82 FR at 3093.

³⁴ 40 CFR part 51 appendix Y, Guidelines for BART Determinations Under the Regional Haze Rule § III.

³⁵ *See also* August 2019 Guidance footnote 41.

The differences between approaches include the type and number of days considered for a single source analysis, the emissions used to represent a single source, and metrics used to express visibility impacts. In particular, the BART Guidelines recommended modeling the highest measured daily emissions for a source, using the same high emissions value for every day of the year, in conjunction with a 98th percentile visibility metric that focused on the days with the largest visibility impact *from the source*. In addition, BART modeling assessments used 3 consecutive years to capture meteorological regimes that would be most conducive to high source impacts at a given downwind receptor. That makes the BART modeling results particularly conservative compared to current photochemical modeling that generally uses actual hourly and daily emissions, and typically evaluates visibility impacts averaged over the 20 percent most impaired days for a single year (representing the days with the largest anthropogenic visibility impairment at the Class I area receptors, not the days with the largest visibility impacts from the source). In many cases, the difference in the form of the modeled emissions and the visibility impact metrics alone could account for BART Guideline modeling impacts that are an order of magnitude, or more, higher than typical photochemical modeling impacts averaged over the 20 percent most impaired days for a single year.

Additionally, the August 2019 Guidance discusses other metrics³⁶ that may be appropriate for evaluating visibility impacts from individual sources, and notes that modeling a single year of meteorology and evaluating impacts only on the 20 percent most impaired days may not fully capture visibility impacts from an individual source at a given Class I area. The Guidance suggests that other metrics such as the maximum daily impact over the year may be a more meaningful metric for examining individual source impacts.³⁷ If available, visibility impacts from individual sectors and sources can also be evaluated as a fraction of state and/or total U.S. anthropogenic visibility impairment at a Class I area. Evaluating a source's or sector's visibility impact as a fraction of *anthropogenic* impairment is preferable to calculating impacts relative to *total* impairment since anthropogenic impairment is directly relevant to determining what constitutes reasonable progress towards the national goal. As noted elsewhere, a source's visibility impact relative to a *state's* total contribution to visibility impairment is relevant to ensuring that a state is addressing its own contribution regardless of what other states are doing.

5.4. Uniform Rate of Progress is Not a “Safe Harbor”

EPA has reviewed several draft second planning period regional haze SIPs that conclude that additional controls, including potentially cost-effective and otherwise reasonable controls, are not needed because all of the Class I areas in the state (and those out-of-state areas affected by emissions from the state) are below their uniform rates of progress (URPs). The 2017 RHR preamble and the August 2019 Guidance clearly state that it is not appropriate to use the URP in this way, *i.e.*, as a “safe harbor.” The URP is a planning metric used to gauge the amount of progress made thus far and the amount left to make. It is not based on consideration of the four statutory factors and, therefore, cannot answer the question of whether the amount of progress made in any particular implementation period is “reasonable progress.” This concept was explained in the RHR preamble.³⁸ Therefore, states must select a reasonable number sources and

³⁶ See August 2019 Guidance at 35.

³⁷ See August 2019 Guidance at 15-16 and 35.

³⁸ 82 FR at 3099.

evaluate and determine emission reduction measures that are necessary to make reasonable progress by considering the four statutory factors.

5.5. Contents of the Long-term Strategy and Setting RPGs

EPA has observed that, in some instances, states are not clearly articulating what measures are necessary for reasonable progress and being submitted for inclusion in the regulatory portion of their SIPs. Pursuant to CAA section 169A(b)(2) and 40 CFR 51.308(f)(2), the measures that are necessary to make reasonable progress must be included in a state's long-term strategy. States should clearly identify in their SIP narratives the emission reduction measures they have determined are necessary to make reasonable progress, as well as the corresponding emission limits and supporting conditions to make those limits practicably enforceable³⁹ that will be included in the regulatory portion of their SIPs. We note that states may also in their discretion identify additional measures, beyond what is necessary to make reasonable progress, for inclusion in the long-term strategy. Such optional measures do not, however, satisfy a state's obligation to identify the measures that are necessary to make reasonable progress by considering the four statutory factors and include those measures in the long-term strategy.

5.6. Environmental Justice

EPA encourages states to consider whether there may be equity and environmental justice impacts when developing their regional haze strategies for the second planning period. This consideration could occur in different ways, including undertaking meaningful outreach to environmental justice communities; ensuring adequate opportunity for feedback on states' proposed strategies; and considering equity and environmental justice impacts as part of the technical analyses supporting the SIP, including source selection and four-factor analyses. For example, states could consider environmental justice when they consider the appropriate inclusivity of source selection and the suite of emissions control options that should be analyzed, and when they exercise their discretion in determining what is necessary to make reasonable progress towards the national visibility goal. In general, we encourage states to be aware of where sources of visibility impairing air pollutants are located and impacts, they may have on environmental justice communities. States have discretion to consider environmental justice in determining the measures that are necessary to make reasonable progress and formulating their long-term strategies, as long as such consideration is reasonable and not contrary to the regional haze requirements.

6. Conclusion

EPA appreciates all the efforts of stakeholders, states, and Regional offices to support development of second planning period SIPs that are consistent with the RHR and the CAA. This memorandum is intended to broadly share specific issues and information commonly arising during SIP development in an effort to continue to support development of approvable SIPs. We appreciate that Regional offices will continue to be engaged with states and provide feedback on these and other aspects of draft second planning period SIPs. Additional consultation and coordination requirements of the RHR provide states with important information and

³⁹ See August 2019 Guidance at 42-43.

considerations from FLMs and other states relevant to the reasonable progress analysis. Regional offices are encouraged to urge states to consider that feedback and engage in timely and complete consultations to support development of approvable SIPs.

Please share this memorandum with your staff, as well as colleagues at state, local, and tribal air agencies. If states or stakeholders have state-specific questions, we encourage them to reach out to relevant Regional office contacts. If you have any questions concerning this memorandum, please contact Vera Kornylak, Associate Director of the Air Quality Policy Division at *kornylak.vera@epa.gov* or (919) 541-4067. This memorandum is posted on EPA's visibility website at: *<https://www.epa.gov/visibility/clarifications-regarding-regional-haze-state-implementation-plans-second-implementation>*.