

Screening and Control Measure Analysis for the Second Regional Haze Planning Period

WRAP Regional Haze Planning Work Group

Teach-In #5 -- Source Apportionment and Source Evaluation (4-factor)

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NEVADA DIVISION OF
**ENVIRONMENTAL
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Frank Forsgren
Nevada Bureau of Air Quality Planning

July 2016 Draft EPA Guidance

- *Draft Guidance on Progress Tracking Metrics, Long-Term Strategies, Reasonable Progress Goals and Other Requirements for Regional Haze State Implementation Plans for the Second Implementation Period*
- <https://www.epa.gov/visibility/draft-guidance-second-implementation-period-regional-haze-rule>

Key Steps in Developing the Regional Haze State Implementation Plan

- Ambient Data Analysis
 - *Quantify baseline, current and natural conditions of visibility and the uniform rate of progress that would achieve natural conditions in 2064.*
- **Screening of Sources**
 - *Identify the pollutants and emission sources for which a full reasonable progress analysis will be completed and explain why it is appropriate to limit the full analysis to only these sources.*
- **Source and Emission Control Measure Analysis**
 - *Identify potential emission control measures for sources selected in the screening step and develop data on the four statutory factors and visibility benefits if they will be considered.*
- **Decisions on the Content of the Long-Term Strategy**
 - *Consider applicable factors and decide on new emission controls for incorporation into the LTS.*
- Regional Scale Modeling
 - *Model the emission reductions that will result from implementation of the LTS and other enforceable measures that will reduce visibility impairment to set the Reasonable Progress Goals for 2028.*
- Progress, Degradation, and Glidepath Checks
 - *Demonstrate that there will be improvement on the 20% most impaired days. Demonstrate that there is no degradation on the 20% clearest days. Compare the 2028 RPG for the 20% most impaired days to the 2028 point on the URP line (the glidepath) and, if required, provide additional justification for the reasonableness of the RPG. Revise the LTS if additional measures are identified as necessary to make reasonable progress.*
- Additional Requirements for SIPs
 - *Provide additional information necessary to ensure that other requirements of the Regional Haze Rule are met.*

Considering Visibility for Screening and Conducting a Four-Factor Analysis

- EPA-Recommended Approach for the Second Planning Period
 - *States first conduct a screening analysis that considers baseline visibility impacts to identify the sources or source categories that will be subject to four-factor analysis. After the screening step, states consider only the four statutory factors.*
- Alternative Approaches
 - *First Alternative Approach: A state would simply consider the available control measures for all sources.*
 - *Second Alternative Approach: States would consider visibility both during the screening step and when considering the four statutory factors.*

Screening of Sources

- Applicable to states using the EPA-Recommended or Second Alternative Approach
 - Determining which Class I areas need to be considered
 - Estimating visibility impacts for screening
 - Selecting sources for analysis based on visibility results
 - Other factors to consider when selecting sources for analysis
 - Special considerations for particular types of sources

Which Class I areas?

- A State's emissions are linked its Class I area (CIA), but also to out-of-state CIAs that may be affected by its emissions.
- Emissions divided by distance, emissions-weighted back trajectory analysis, or use of photochemical transport models are approaches to assess which Class I are affected by a State's emissions.
- EPA recommends a conservative approach to determine whether a state's sources affect visibility at out-of-state CIAs, suggesting states *consider all CIAs where the state contributes >1% of the total US anthropogenic light extinction on any of the 20% most impaired days.*
- The state must provide an adequate explanation of why the threshold is sufficiently protective of visibility.

Estimating Visibility Impacts

- Guidance assumes the use of models, consistent with Appendix W, to determine impacts and benefits, but can be applied to surrogate methods, although surrogates may not be useful for benefits.
- Modeling for screening should be based on 2028 emissions but may be based on typical past emission rates. Operating restrictions should be effective July 31, 2021 for screening purposes. The temporal representation should capture seasonal and diurnal emission variations.
- Consider impacts on 20% most impaired day relative to a clean/natural background for screening.
- Sources may be aggregated for screening.
- BART guidelines remain relevant to assessing the facts related to visibility impacts and benefits, although there are many differences (model selection, emission rates used, days evaluated).

Selecting Sources for Analysis

- The average anthropogenic extinction budget on the 20% most impaired days will identify the pollutants of interest. States should *not exclude PM species representing > 10% of current anthropogenic extinction*, and excluded species should not total > 20% of anthropogenic extinction.
- The state-identified screening threshold should capture a combination of major stationary sources, minor stationary sources, and minor/area stationary *sources that account of a large fraction of in-state anthropogenic extinction* (80% is considered to be a reasonably large fraction).
- Sources can be compared to the threshold individually (major sources) or in aggregate (minor sources). *Units representing 80% of the impairment from the facility as a whole* should be brought forward for analysis.

Selecting Sources for Analysis (continued)

- Visibility impacts on multiple Class I areas should be assessed.
- BART-eligible sources should be considered during screening.
- Surrogates such as emissions (tpy) divided by distance (km) can be utilized as a rough indicator of impacts. Methods that link sources with Class I areas using wind trajectories may be more refined than Q/d , but either surrogate should be informed by modeling.

What Other Factors May Be Considered When Selecting Sources for Four-Factor Analysis

- Subject sources with federally enforceable emission limit that requires the most effective control technology may be screened out.
- EGU's with recently installed, most effective control technologies installed in the last 5 years may, in some cases, be screened out.
- Screening Based on the Four Factors
 - Remaining Useful Life
 - If a source is certain to shut down by 2028, it may be removed from screening due to the limited time the controls would provide visibility benefits
 - These factors should not be used in the screening step
 - Cost of Compliance
 - Time Necessary for Compliance
 - Energy Impacts
 - Non-Air Impacts

Special Considerations for Particular Types of Sources

- **Sources Presenting Special Implementation Challenges**
Sources should not be screened out that can be practically regulated
- **Sources not Within State Authority**
Reasonable progress analysis is not necessary for sources/controls over which the state does not have authority such as mobile sources.
States may not rely on the fact that its authorizing legislation prohibits it from adopting controls more stringent than required by federal law or regulation.
Federal agencies must follow state-imposed requirements related to visibility impairment.
- **Wildland Fire**
 - First Path – Prescribed wildland fire not considered for analysis
 - Second Path – Prescribed wildland fire subject to four factor analysis
- **Other Natural Sources**
A state has no obligation to consider controls on natural sources.

The Four Statutory Factors

1. Cost of compliance
2. Time necessary for compliance
3. Energy and non-air quality environmental impacts of compliance
4. Remaining useful life of an existing source subject to such requirements

Control Analysis

- The terms "RACT," "BACT," and "LAER" are acronyms for different program requirements under the NSR program.
- **RACT, or Reasonably Available Control Technology**, is required on existing sources in areas that are not meeting national ambient air quality standards (i.e., non-attainment areas).
- **BACT, or Best Available Control Technology**, is required on major new or modified sources subject to PSD in clean areas (i.e., attainment areas). BACT is selected by performing a “top-down” analysis of existing, operating control technologies on similar emission units that considers several factors including: performance, technical feasibility and cost.
- **LAER, or Lowest Achievable Emission Rate**, is required on major new or modified sources in non-attainment areas. LAER is the most stringent emissions limitation which is achieved in practice by such class or category of stationary sources. A LAER determination does not exclude technology on the basis of economic cost, as may be permissible under BACT.
- BACT and LAER (and sometimes RACT) are determined on a case-by-case basis, usually by State or local permitting agencies.
- Resources
 - Literature
 - Industrial surveys
 - [RACT/BACT/LAER Clearinghouse](#)
 - EPA/State/Local air pollution control agency surveys

Selecting Control Measures without Considering Visibility Benefits

- Guidance for states following the EPA-recommended approach or the first alternative approach. Some items are common to second alternative approach.
- “Necessary to make reasonable progress”
 - Reject control measures only when one of the four factors, or a combination of factors makes it unreasonable to require.
 - Select the most effective emission reduction measure for each source within a range of reasonableness.
- Rely on cost/ton metric and past regulatory actions
- Under these approaches, the cost of control is not a surrogate for visibility benefit
- Other considerations
 - Separable sources and emission units
 - Multiple control alternatives, including combination of controls
 - Viability of continued plant operations

Selecting Measures Based on Visibility Benefits

--Balancing Control Technology and Visibility Benefit--

- Guidance for states following the second alternative approach, considering visibility benefits along with the four statutory factors.
- “Necessary to make reasonable progress”
 - Reasonable to require based on four factors alone, reasonable to require when weighing the visibility benefits along with the four factors
 - Assess maximum visibility benefit, as well as the average benefit across the distribution, on the 20% most impaired days
- Note the differences in the analytical methods when comparing past decisions; NAAQS attainment or PSD increment reductions are not directly relevant
- States should not base decisions on cost/benefit analysis
- Consider the visibility benefits across multiple Class I areas, but not necessarily the number of days above a threshold
- Controls should not be rejected on the basis that the visibility benefit is imperceptible
- Thresholds may be useful when weighing cost and visibility benefits for more expensive control measures
- Considerations when weighing costs and visibility benefits
 - *Provide a reasoned and logical explanation for how it considered costs, assessed visibility benefits, and weighed costs and visibility benefits in deciding what measures are necessary to make reasonable progress.*
- Other considerations
 - Separable sources and emission units
 - Concerns with the use of the cost/deciview metric
 - Visitation
 - Viability of continued plant operations

Factors to Consider in Developing Long-Term Strategy

- Emissions reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment.
- Measure to mitigate the impacts of construction activities.
- Emissions limitations and schedules of compliance to achieve the reasonable progress goal.
- Source retirement and replacement schedules.
- Basic smoke management practices for prescribed fire used for agriculture and wildland vegetation management purposes and smoke management programs as currently exist with the State for these purposes.
- Enforceability of emissions limitations and control measures.
- 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.

Reasonable Progress Requirement

- 51.308(f)(2)(ii). The State must consider the uniform rate of improvement of visibility, the emission reduction measures identified in (f)(2)(i), and additional measures being adopted by other contribution states in (f)(2)(iii) as needed to make reasonable progress towards natural visibility conditions for the period covered by the implementation plan.
 - Compare its RPG for the 20% most impaired days to the URP line and, if applicable, provide additional demonstrations per the requirement of section 308(f)(3)(ii)(B)