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Clearing the Air on Regional Haze

Protecting Visibility Under the Clean Air Act

Norman W. Fichthorn
Partner, Hunton Andrews Kurth LLP
Washington, D.C.

The Clean Air Act Visibility Protection Program – A Broad Overview

- National goal, declared in the Act: “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” (Clean Air Act (CAA) § 169A(a)(1), 42 USC § 7491(a)(1))
- “Mandatory class I Federal areas” include national parks over 6,000 acres and national wilderness areas over 5,000 acres in size
 - This is focused protection – it doesn't address, for example, urban-area visibility impairment
- Addresses only “manmade” – or “anthropogenic” – pollution sources. Doesn't attempt to control impairment from natural (biogenic) sources, *e.g.*, wildfires, dust storms
- May result in imposition of emission limits on electric generating facilities and other sources

The Clean Air Act Visibility Protection Program – A Brief History

- Enacted by Congress in 1977
- EPA issued first implementing regulations in 1980
 - Those regulations addressed only “reasonably attributable visibility impairment” (a/k/a “plume blight”) – *i.e.*, visibility impairment attributable to one source or a small number of sources
 - Deferred regulation of the more difficult issue of “regional haze” – *i.e.*, visibility impairment “caused by the emission of air pollutants from numerous anthropogenic sources located over a wide geographic area”
- EPA issued regional haze regulations in 1999:
 - set a (non-binding) goal of achieving natural visibility in protected Class I areas by 2064
 - required states to submit regional haze “state implementation plans” to EPA
- EPA revised regional haze regulations in 2005, 2006, 2012, and 2017

EPA's Regional Haze Regulations

- Regulations require state implementation plans to be prepared and submitted to EPA for approval (or disapproval) every 10 years
 - Each plan to address a 10-year “planning period” (also known as “implementation period”)
- Each state in the country must address
 - protected Class I areas – if any – that are located within the state's borders; and
 - protected Class I areas outside the state that are impacted by emissions from within the state
- State implementation plans may require emission controls on sources, especially larger stationary sources, such as many fossil fuel-fired power plants

EPA's Regional Haze Regulations

- First planning period – continued until December 31, 2018
- Two main regulatory programs:
 - “Best Available Retrofit Technology” (BART)
 - This program generally imposes emission control requirements only in the *first* planning period (*i.e.*, through 2018)
 - But in most cases, BART emission controls imposed on a source must continue to be operated, even after the first planning period ends, as long as the emission source is operating
 - “Reasonable Progress” toward the national visibility goal of no anthropogenic impairment
 - Applies in both the first planning period and each subsequent planning period
 - States must assess reasonable progress anew for every 10-year planning period

Best Available Retrofit Technology (BART) – First Planning Period

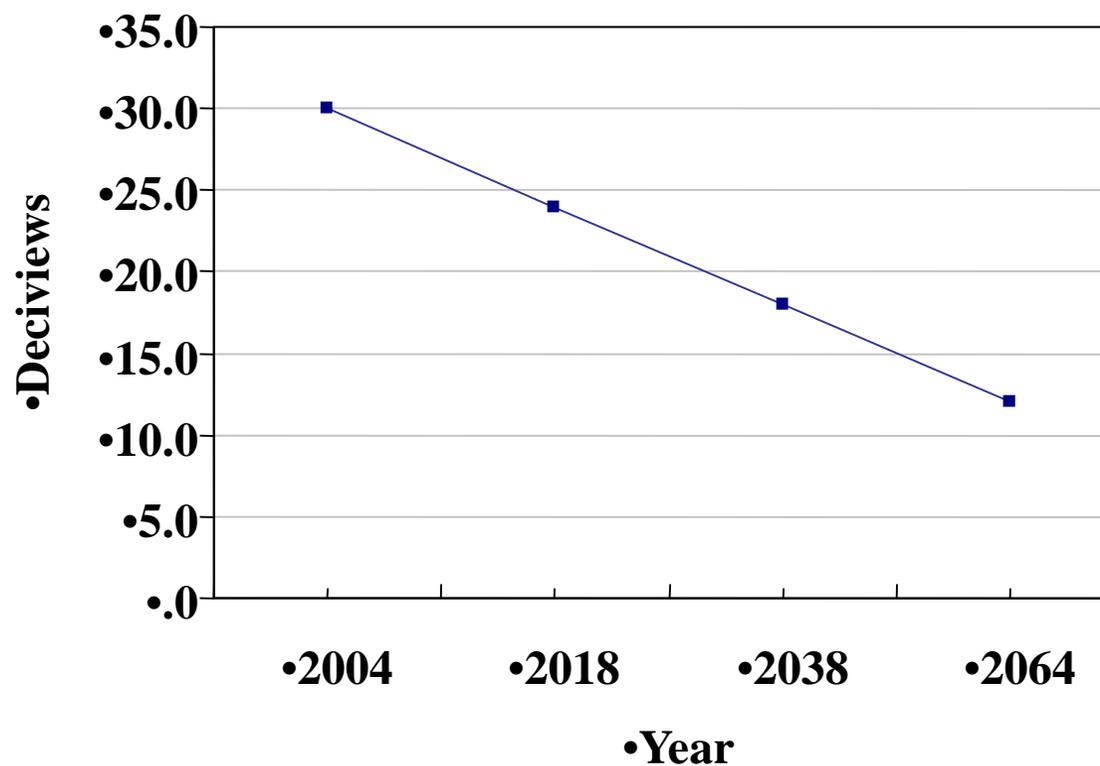
- Imposed only in the first planning period – but BART emission limits generally will continue in effect as long as the regulated facility is in operation
- Applies to 26 categories of emission sources, including fossil fuel-fired steam electric plants of more than 250 million Btu's per hour heat input
- Applies to any stationary source in one of those 26 categories that
 - was not in operation before August 7, 1962, but was in existence on August 7, 1977, and
 - has the potential to emit at least 250 tons/year of any visibility-impairing pollutant (generally, sulfur dioxide, nitrogen oxides, or particulate matter), and
 - “may reasonably be anticipated to cause or contribute to any impairment of visibility in any” protected Class I area

Best Available Retrofit Technology (BART) – First Planning Period

- BART emission limits were imposed on many coal-fired power plants in the West, especially for nitrogen oxide (NO_x) emissions
 - For NO_x emissions, some BART limits required installation of selective catalytic reduction (SCR) or selective noncatalytic reduction (SNCR) – these are both “post-combustion” emission controls, and are usually more expensive (often much more so) than combustion controls
 - Most western plants were generally deemed already sufficiently controlled for sulfur dioxide (SO₂)
 - Particulate matter also was generally well-controlled (and also typically has less visibility impact)
- Power plants in most eastern states are subject to the Cross-State Air Pollution Rule (CSAPR) for SO₂ and/or NO_x, and are within an EPA-established “CSAPR=BART” safe harbor for BART for those pollutants – they generally didn’t have to install controls for BART

Reasonable Progress

The Uniform Rate of Progress
(conceptual example)



Reasonable Progress

- What is a “**deciview**”?
 - A “unit of measurement ... for quantifying in a standard manner human perceptions of visibility” (40 CFR § 51.301)
 - EPA considers 1.0 deciview to generally reflect the threshold of human perceptibility in a wide range of visual air quality conditions
- What is the “**Uniform Rate of Progress**” (a/k/a “URP,” “glidepath,” or “glide slope”)?
 - The “uniform rate of visibility improvement (measured in deciviews of improvement per year) that would need to be maintained during each [10-year] implementation period in order to attain natural visibility conditions by the end of 2064” (40 CFR § 51.308(f)(1)(vi)(A))
 - **To calculate the URP for a given area**, “compare the [2000-2004] baseline visibility condition for the most impaired days to the natural visibility condition for the most impaired days in the ... area and determine the uniform rate of visibility improvement (measured in deciviews of improvement per year) that would need to be maintained during each implementation period in order to attain natural visibility conditions by the end of 2064” (40 CFR § 51.308(f)(1)(vi)(A))
 - “Most impaired days” = “the twenty percent of monitored days in a calendar year with the highest amounts of anthropogenic visibility impairment” at the Class I area being evaluated (40 CFR § 51.301)

Reasonable Progress

- The Uniform Rate of Progress applies only to the 20% most impaired (“worst”) days in a year
- For the 20% clearest (“best”) days, the requirement is “no degradation” compared to baseline
- Reasonable progress goal (RPG) and long-term strategy for each planning period
 - A state implementation plan’s “long-term strategy and ... [RPGs] must provide for an improvement in visibility for the most impaired days since the baseline period and ensure no degradation in visibility for the [20%] clearest days since the baseline period” (40 CFR § 51.308(f)(3)(i))
 - Visibility improvements produced by emission limits included in the long-term strategy (plus other existing CAA requirements) are modeled, yielding the RPG for the planning period

Reasonable Progress

- Is the RPG for a given planning period required to be at least as ambitious as – *i.e.*, as “fast” as – the URP for the area in question? No, but if it isn’t, then the state must:
 - make a “robust demonstration” that “there are no additional emission reduction measures ... that would be reasonable to include in the long-term strategy” (40 CFR § 51.308(f)(3)(ii)(A))
 - include in the plan “an assessment of the number of years” – *i.e.*, a period extending beyond 2064 – that “it would take to attain natural visibility conditions if visibility improvement were to continue at the rate of progress selected” (40 CFR § 51.308(f)(3)(ii)(A))
- Note that the state may – subject to EPA approval – adjust the URP to account for effects of non-U.S. (international) anthropogenic emissions and certain “prescribed fires” in wildlands (40 CFR § 51.308(f)(1)(vi)(B))
 - “Increase” natural conditions in 2064 to account for effects of non-U.S. emissions and prescribed fires; these adjustments make the URP “glidepath” less steep – and, thus, less difficult to meet

Reasonable Progress – Emission Limits

- State must include in its long-term strategy for a given planning period “the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress” for that planning period (40 CFR § 51.308(f)(2))
 - States first consider which sources should undergo assessment for potential emission limits; this is the “source selection” step. Note that states have substantial discretion at this step.
 - State may consider a source's baseline visibility impact, *e.g.*, through trajectory analysis, photochemical modeling, or use of a “Q/d” threshold (**Quantity** in tons of annual emissions from the source divided by distance in kilometers from the source to the nearest protected Class I area) – *e.g.*, Q/d threshold of 10
 - State may consider four statutory “reasonable progress factors”: **costs** of compliance; **time necessary for compliance**; **energy and non-air quality environmental impacts of compliance**; and **remaining useful life** of the source
 - State may consider five additional factors: emission reductions from ongoing pollution control programs; measures to mitigate construction-activity impacts; source retirement and replacement schedules; basic smoke management practices for prescribed fires and smoke management programs; and anticipated net effects on visibility due to projected changes in all source sectors' emissions
 - Any other factors that are reasonable to consider

Reasonable Progress – Emission Limits

- For selected sources, assess potential emission limits to impose
 - Must take into consideration each of the four statutory factors (these are called “four-factor analyses”):
 - costs of compliance;
 - time necessary for compliance;
 - energy and non-air quality environmental impacts of compliance; and
 - remaining useful life of the source
 - Also must consider the five additional factors (listed on previous slide), unless already considered in the source selection step
 - May consider the degree of visibility benefits from emission controls
 - Interstate consultation: State “must consult with those States that have emissions that are reasonably anticipated to contribute to visibility impairment” in the protected area “to develop coordinated emission management strategies containing the emission reductions necessary to make reasonable progress” – and state must adopt “all measures agreed to during state-to-state consultations or a regional planning process, or measures that will provide equivalent visibility improvement” (40 C.F.R. § 51.308(f)(2)(ii))

Reasonable Progress Goals (RPGs)

- Use regional-scale photochemical modeling (or other appropriate techniques) to project visibility conditions in protected areas in 2028 resulting from all emission control measures
- This sets the reasonable progress goal (RPG) for 2028 for the protected Class I area, expressed in deciviews
- For those states with protected Class I areas, show that there will be:
 - Improvement in the most impaired days in 2028, compared to baseline (2000-2004)
 - No degradation on 20% clearest days in 2028, compared to baseline
 - Determine URP, with or without any adjustment for non-U.S. emissions' effects and prescribed-fire effects
 - If RPG is above (worse than) the URP, make the required demonstration regarding any additional controls and the additional time that will be necessary to attain natural visibility conditions

State Plans – Procedural Steps

- States must submit to EPA implementation plans for the second planning period by July 31, 2021
- That seems like a long time away. But it's not. The analytical steps can be very time-consuming.
- States must follow EPA rules (*e.g.*, 40 C.F.R. §§ 51.301, 51.308(f) and (i))
- EPA recently issued three important guidance documents for states to use:
 - “Technical Guidance on Tracking Visibility Progress for the Second Implementation Period of the Regional Haze Program” (Dec. 20, 2018)
 - “Guidance on Regional Haze State Implementation Plans for the Second Implementation Period” (Aug. 20, 2019)
 - “Technical Support Document for EPA’s Updated 2028 Regional Haze Modeling” (Sept. 19, 2019)
- EPA guidance documents are available at www.epa.gov/visibility

State Plans – Procedural Steps

- Many states have assessment processes underway now (*e.g.*, Arizona, Colorado, New Mexico, North Dakota) – Key steps include:
 - Screening sources (source selection step)
 - Four-factor (and related) analyses
 - Preparing the draft state implementation plan
 - Consultations with “Federal Land Managers” – *i.e.*, agencies with jurisdiction over protected Class I areas (*e.g.*, National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service)
 - Public hearing and comments on the draft state implementation plan
 - Final state action – respond to comments, prepare and adopt final plan, and submit it to EPA

State Plans – EPA Review and Approval (or Disapproval)

- Within 6 months after submittal of state plan to EPA – or, if earlier, January 31, 2022 – EPA must determine if plan is “complete” (meets “minimum criteria”) (CAA § 110(k)(1), 42 USC § 7410(k)(1))
 - If EPA fails to make any “completeness determination” within 6 months, plan is deemed complete
- Within 12 months after a completeness determination, EPA must approve or disapprove the plan (CAA § 110(k)(2), 42 USC § 7410(k)(2))
 - EPA must first publish proposed approval or disapproval for public comment
- If EPA disapproves plan, or finds state failed to submit a complete plan, EPA must adopt within 2 years (after public notice and comment) a “federal implementation plan” – unless in the meantime the state submits, and EPA approves, a state plan (CAA § 110(c)(1), 42 USC § 7410(c)(1))
- Any final EPA approval/disapproval, and any federal implementation plan, can be challenged in U.S. Circuit Court of Appeals within 60 days after Federal Register publication of EPA's action

State Plans – Involvement by Source Owners and Operators, Including Public Utilities

- Many states are effectively requiring, or at least expecting, source owners and operators to provide information needed for source screening and/or four-factor (and related) analyses
- Sources may want to present any reasonable arguments that they should be “screened out”
- In many cases, sources selected for full four-factor analyses will be conducting – and paying for – those analyses, which can be – and often are – very complex
- Resulting emission controls can be expensive and complicated
- Early and continuing participation in state processes provides opportunities for public power utilities (and other source owners/operators) to advance their views concerning possible emission-control determinations and the substance and presentation of state plans
- Participation by source owners can help make plans more likely to be approved by EPA and can increase the likelihood that EPA approval will withstand potential judicial review

QUESTIONS?

Norman W. Fichthorn
Partner

Hunton Andrews Kurth LLP
nfichthorn@huntonak.com

202-955-1673