National Ambient Air Quality Standard Update

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Hot Topic Hour

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ALL4

CAA 109 National Ambient Air Quality Standards

- 109(b) – the NAAQS
  - Primary standards: attainment and maintenance protect public health with adequate margin of safety
  - Secondary standards: protect public welfare
- 109(d)(1) – timing
  - Every 5 years, "thorough" review of NAAQS
  - Revise as necessary
  - May also be done more frequently

Current NAAQS Revisions

- Lead
- $PM_{2.5}$
- CO
- Ozone
- NO_2 (Primary and Secondary)
- SO_2 (Primary and Secondary)

NAAQS Summary

Pollutant	Averaging Period	Historic NAAQS ($\mu g/m^3$)	Revised NAAQS ($\mu g/m^3$)
CO	1-Hour	10,000	10,000
	8-Hour	40,000	40,000
Ozone	8-Hour	75 ppb	**60 – 70 ppb (proposed)**
Pb	3-Month Rolling	1.5	**0.15**
PM_{10}	24-Hour	150	150
$PM_{2.5}$	24-Hour	65	**35**
	Annual	15	15
NO_2	1-Hour	N/A	**188**
	Annual	100	100
SO_2	1-Hour	N/A	**196**
	3-Hour	1,300	1,300
	24-hour	365	**N/A**
	Annual	80	**N/A**

New NAAQS Considerations

- Historic NAAQS levels often not viewed as impacting day-to-day permitting.
- New 1-Hour NAAQS levels are very stringent (example for SO_2):
  - SO_2 3-Hour to Annual Ratio: 16.25
  - SO_2 1-Hour to Annual Ratio: 2.45
- It may be difficult to directly demonstrate compliance with the NAAQS.

PSD Permitting Considerations

- Step 1 of a PSD NAAQS assessment is a significant impact level (SIL) analysis.
- U.S. EPA has established interim SILs:
  - 24-Hour $PM_{2.5}$ SIL: 0.3 µg/m^3
  - 1-Hour NO_2 SIL: 7.5 µg/m^3
  - 1-Hour SO_2 SIL: 7.9 µg/m^3
- Exceedance of the SILs will trigger a facility-wide NAAQS evaluation.
- Consider short-term emissions increases.

Stringency of the NAAQS

- Many facilities with any combination of the following may have difficulty modeling NAAQS compliance:
  - Elevated emission rates (fuel oil combustion, process SO_2, etc.)
  - Low stack heights
  - Building downwash to any extent
  - Complex terrain

Attainment/Nonattainment Designations

- U.S. EPA philosophy on the SO_2 NAAQS implementation process:
  - Proposed NAAQS rule - designations based on ambient monitoring data
  - Final NAAQS rule - designations based primarily on air quality modeling data
- Shift to reliance on air quality modeling will become a critical issue for individual facilities.

SO_2 NAAQS Implementation

- NAAQS Implementation Schedule:
  - June 2011: Initial state nonattainment recommendations to U.S. EPA (most counties will be "unclassifiable")
  - June 2013: State SIP submittals to achieve compliance with the NAAQS (including air quality modeling for individual facilities)
  - 2017: Full NAAQS compliance in all areas

Planning Ahead

- Emissions Strategies:
  - Evaluate adequacy of emission limits
  - Evaluate emissions control options
  - Evaluate alternate fuels and fuel specifications
- Facility Fence Line Strategies

Planning Ahead

- Stack/Exhaust Strategies:
  - Combined source exhausts
  - Co-located exhaust points to increase buoyancy
  - "Turn up" horizontal stacks
  - Increase stack heights

Planning Ahead

- Air Quality Modeling Strategies:
  - Temporal pairing approach
  - Plume transport time
  - Surrounding surface characteristics
  - Wind speed monitor thresholds
  - Mechanical mixing height considerations
  - Alternative models (CALPUFF, etc.)
  - Atmospheric chemistry options for NO_2

Conclusions

- The new 1-hour NAAQS levels are so stringent that they will drive project feasibility and project design.
- NAAQS will replace BACT as the most critical PSD permitting issue.
- NAAQS modeling will be required even in the absence of new projects.
- Plan early for new projects and for the SO_2 NAAQS implementation process.

Questions?

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