Louisiana AWMA meeting

Panel Discussion - Modeling and Monitoring Issues/Guidance

History/How did we get here?

- 42 U.S. Code 7475 – Preconstruction requirements
  - **(a) Major emitting facilities on which construction is commenced** No major emitting facility on which construction is commenced after August 7, 1977, may be constructed in any area to which this part applies unless—
  - (a)(3) the owner or operator of such facility demonstrates, as required pursuant to section 7410(j) of this title, that emissions from construction or operation of such facility will not cause, or contribute to, air pollution in excess of any
    - (A) maximum allowable increase or maximum allowable concentration for any pollutant in any area to which this part applies more than one time per year,
    - (B) national ambient air quality standard in any air quality control region, or
    - (C) any other applicable emission standard or standard of performance under this chapter;
- This general requirement to not cause or contribute dates to the 1970 CAA and the states 1st permitting program requirements and is usually found in the General Provisions of the any state's permitting regulations.

Early/Current PSD modeling Guidance

- Pre-construction monitoring was expected in many cases.
- 1978 Modeling Guidance – Guideline on Air Quality Models (GAQM)
  - “If a small number of other identifiable sources are located nearby, the impact of these sources should be specifically determined. The background concentration due to natural or distant sources can be determined using procedures already described. The impact of the nearby sources must be summed for locations where interactions between the effluents of the point source under consideration and those of nearby sources can occur. Significant locations include (1) the area of maximum impact of the point source, (2) the area of maximum impact of nearby sources, and 3) the area where all sources combine to cause maximum impact. It may be necessary to identify these locations through a trial and error analysis.”
- This language is still carried through in GAQM 8.2.3(e) but the small number of sources caveat has been reworded and moved to GAQM 8.2.3(b).
- Current GAQM 8.2.3(f): Other Sources: That portion of the background attributable to all other sources (e.g., natural sources, minor sources and distant major sources) should be determined by the procedures found in section 8.2.2 or by application of a model using table 8–1 or 8–2.

Background Sources vs. Monitoring data

- Need analysis to demonstrate new source/modification will not contribute to NAAQS, Increment, or other ambient standard violations.
- 2 Areas of concern for modeling (approach dates back to 1978 and 1980)
  - Sources within the Area/Receptors that source is significant.
  - Sources outside the source's significance area, but contribute significant concentration gradient within significance area.
- What sources to include is based somewhat on professional judgment of what the monitor data represents and what other sources can potentially contribute/threaten NAAQS or increment standards that are within the significance area.

Paradigm Shift

- New Standards are much tighter than old Standards
  - SO2 3-Hour was 1300 µg/m3, new 1-Hour is 196 µg/m3
    - Shorter averaging time and about 1/6 of previous standard
  - NO2 Annual was 100 µg/m3, new 1-Hour is Higher, but much shorter averaging time, so also more difficult.
- Old guidance based on older standards has not been fully updated based on new standards.
- New standards are resulting in Significant Impact Areas much larger than past modeling.
- For more industrialized areas such as Houston area and along the Mississippi River the area that has to be evaluated for contribution concerns is larger because of these new, tighter standards.

Paradigm Shift (cont.)

- Old approach of modeling all sources within significance area and within up to 50 km is still an acceptable approach, but is a conservative approach.
- EPA has recognized this and issued additional guidance that much of this conservatism can be removed but it entails more of a case-by-case determination in place of the quick ‘cookie cutter’ approach.
- EPA issued 1-Hour NO2 modeling guidance in 2011 discussing that under some circumstances the cumulative inventory may only need to go out 10 km.
  - For smaller sources with small impact areas and not near other major sources this can be a valid approach based on documentation of decision and use of professional judgment.
  - For sources with larger impact areas this guidance still indicates we work to minimize the area analyzed, but the 10 km is not reasonable in almost all situations for larger sources.
  - Location of background monitoring data and what it represents also has to be considered in deciding sources to include.
- EPA’s current guidance focused on new standards still has to meet the requirements of the CAA statutes, but does allow for refining the cumulative inventory as much as can be justified.

Based on New Paradigm

- Recommend try to not be significant or minimize the area of significance, especially in areas with other large sources.
- Recommend sharing significance modeling with permitting agency, and EPA regional offices representatives as needed, to determine cumulative NAAQS and increment inventory. Final decisions are also dependent upon background monitoring data being used and what it represents.
- In many recent cases we have been comfortable with using distances of 20-30 km beyond significance area and sometimes less than 20 km depending on monitoring data and sources in the outer range.
- Environmentalists have been more active in petitioning modeling issues and background monitor/preconstruction monitoring issues so recommend these issues are justified well in modeling protocol and permit issues.
- Example: Nucor was permitted in 2010 and still has some petition issues that are being resolved.