Update on the New EPA Near-Road Multi-Pollutant Monitoring Network

George Allen

Presented at the NESCAUM MAC meeting,October 27, 2010

Background:

Revised 2010 NO2 NAAQS

100 ppb, mean of 3-year 98th %tile of daily max 1-hour value

126 NR sites by Jan. 2013 (plus 40 SV-pop TBD sites)

NR network goal: site at location of max 1-h DV NO2

Issues: Site of Max 1-h NO2 may not always be NR

We don't know where... influence of primary vs. secondary NO2

We don't know what is driving observed NR health effects

We do know a MP NR network is very important!

Q: How do we reconcile a MP NR network in regulatory framework?

Many non-NAAQS measurements are important:

"indicators" of excess NR exposures

-- define spatial extent of NR exposures

BC, UFP robust indicators, easily measured

NO2, CO, PM2.5 less so but are NAAQS, elevated NR

CASAC AAMMS Advisory Meeting on EPA NR network plans

Sept. 29-30, 2010; Felton, Poirot, Allen from NE states
All meeting materials and draft CASAC consensus letter posted:
http://yosemite.epa.gov/sab/sabproduct.nsf/WebCASAC/283BD0C803B1B9468525775E0060236F?OpenDocument
Or... google: “measurement of multiple naaqs”

2 major topics covered by this Advisory:
1. How to determine siting for max NO2 DV concentration
   assist in siting of pilot study and full network
2. What other NR relevant pollutants should be measured
   for both the pilot fixed-sites and the full network.

AAMMS review “Charge Questions” -- broad categories:
- Guidance Document (TAD) development for the 126-site network
- CO and PM network issues related to NR monitoring
- Harmonization of siting criteria for NR multi-pollutant monitoring
- NR pilot studies -- saturation and fixed site designs:
  what to sample and where

Summary of AAMMS concerns:

Siting is difficult; wide range of params to consider
- NR vs. urban canyons vs. secondary NO2 influenced
- NO2 “Saturation” studies useful; takes time (warm/cold seasons)
- Need paired sites for “NR excess” determination (indicators)

EPA’s implementation schedule: too fast given siting unknowns
- Allow adequate time for pilot studies to inform final network
- Delay/Stagger/Tier sites - Regulatory revisions needed

Method issues with PM2.5 and NO2
- PM2.5 FRM semi-volatile mass is difficult to measure
- NO2 FRM (chemiluminescent) has positive artifacts

NCore sites not required to measure NO2 (NOy is required)
- Possible decrease in community scale NO2 sites

AAMMS prioritized consensus list of measurements:
(all would be 1-hour resolution)

1. NO2 (including NO/NOx)

2. Black Carbon (optical)

3. CO

4. UFP (# concentration by CPC)

5. Particle-size distribution (fine mode)

6. PM-coarse

7. PM2.5 [ranks low even though it's a traffic-related NAAQS]

[and then many others: EC/OC, CO2, O3, NOy, SO2, BTEX]

NR monitoring site requirements:

- 1 if urban population >500k
- 2nd if > 2.5 million [or has road segment AADT >250k]
- Sites < 50 m from edge of nearest traffic lane
- No required Met [wind] monitoring
- EPA-RA authority to require additional monitoring as needed in areas expected to exceed the standard

Implementation:

- Initial designation based on existing network (unclassifiable): 1/2012
- New NR/SP network in place 1/2013
- Re-designations based on new NR/SVP network expected by 2017
  Attainment: 2022

Design values (06-08) for Nescaum counties > 50 ppb (not NR siting):

CT: Fairfield (54); New Haven (61)
MA: Boston (56)
NJ: Essex (65); Middlesex (51); Union (78)
NY: Bronx (70); Erie (82); Nassau (58); Queens (67)

Required NR sites for NESCAUM states:

CT: 3
MA: 3; MA/NH: 1
ME: 1
NY: 7
RI/MA: 1
NJ: part of NYC and Phila. PA CBSAs
VT: 0

Next Steps:

Finalize CASAC-AAMMS NR letter: Nov 8 (Casac teleconf mtg)

EPA-OAQPS NR Guidance Doc WG: underway (w/out Dirk/George)

OAQPS Lead: Nealson Watkins

CASAC-AMMS review of NR Guidance Doc: Spring 2011

If implementation not delayed:

State NR network plans due June 2012

Excellent Review of NR studies (ES&T, July 2010):
Near-Roadway Air Quality: Synthesizing the Findings from Real-World Data (Karner et al.)

Environ. Sci. Technol. 2010, 44, 5334–5344
http://pubs.acs.org/doi/abs/10.1021/es100008x