Discussion of Major Air Monitoring Issues

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Discussion Topics

- National Ambient Air Monitoring Strategy (NAAMS)
- Changes in 2006 monitoring allocations
- Precursor Gas Monitoring (PGM)
- PM Standards – status and schedule
- Update on STN/IMPROVE comparability
- Local-scale Air Toxics monitoring projects
- Proposed rule on Exceptional Events
- PM$_{10-2.5}$ monitoring update
- Managing continuous PM$_{2.5}$ in AQS
- National Ambient Air Monitoring Steering Committee (NAAMSC)
Ambient Air Monitoring

• What are the major changes happening in Ambient Air Monitoring?
  – Implementation of the National Ambient Air Monitoring Strategy
  – “Revisions to Ambient Air Quality Regulations” - Notice of Proposed Rulemaking, December 2005
  – Preparing for a potential PM$_{10-2.5}$ monitoring program
Implementation of the National Ambient Air Monitoring Strategy

• Implementation activities that are maturing
  – Robust network of PM$_{2.5}$ continuous monitors for public reporting
  – Recommendations for inclusion in proposed rule change, for example:
    • Development of performance based equivalency criteria for PM continuous monitors
    • Reinvention of the QA program
    • Changes in network minimums
Implementation of the National Ambient Air Monitoring Strategy

• Implementation activities that are underway
  – More NCore level 2 multi-pollutant sites
  – Speciation Networks
    • Planning coordination of Speciation and IMPROVE
    • Reductions at some supplemental speciation sites
  – Data Analyses – Coordinating with EPA - STAPPA/ALAPCO Steering Committee
  – Field testing technologies in CASTNet
  – Development of Network Assessment Guidance
Implementation of the National Ambient Air Monitoring Strategy

- Implementation activities that need to be developed
  - Long-term plan for continuous speciation network
  - Plans for monitoring of ammonia (NH₃) and nitric acid (HNO₃) at multi-pollutant NCore level 2 sites
  - To what extent should we coordinate the meteorological measurement systems on a national basis?
  - 2007 grant guidance
    - How to pay for independent QA?
    - How to provide incentives for eliminating unneeded monitors (PM10, CO, SO2, NO2, Pb)
    - Changes to the PAMS program
    - Will be coordinating with EPA -STAPPA/ALAPCO Steering Committee in January
PM$_{2.5}$ Monitoring Network Implementation

- **PM$_{2.5}$ FRMs and filter FEMs**
  - Attainment Designations completed in 2005
  - Number of FRMs expected to decrease
  - Possible revisions to NAAQS in 2006

- **PM$_{2.5}$ continuous monitoring**
  - Supports AQI
  - Potential to support short term secondary standard for urban visibility

- **Speciation and IMPROVE Programs**
  - IMPROVE program stable
  - Trends Network stable
  - Number of supplemental speciation sites expected to decrease
Revisions to Ambient Air Quality Regulations

• The proposal package is expected to include:
  – Changes as recommended through the national monitoring strategy
    • Expect to implement over period of up to 4 years
  – Provisions for a PM$_{10-2.5}$ monitoring program
    • May not be able to implement until we have approved methods
    • More uncertainty on a schedule; however,
      – 2008 is the first year a network could be operational if everything (NAAQS, capital funds, approved methods, stakeholder support) came together
Revisions to Ambient Air Quality Regulations

• Specific changes:
  – Restructuring of the ambient air monitoring regulations
    • NAMS/SLAMS goes away
    • National Core Network (NCore) arrives
      – Addition of multi-pollutant sites at ~75 sites nationally
  – New performance based criteria for approval of PM continuous methods
    • Nationally – Federal Equivalent Methods
    • One or more States or Locals – Approved Regional Methods
  – Reinvention of the QA program for several areas
Revisions to
Ambient Air Quality Regulations

• Specific changes (continued):
  – 5 year assessments, in addition to annual network reviews
  – Speed up data certification and add QA component for P/A data being in AQS
  – Network minimums
    • Will go away when well below the standard for most pollutants
    • Expect to propose a process for reductions
  – Revised PM and Ozone network minimums
    • Based on size of population; and
    • measured level of pollutants compared to the NAAQS
    • Not looking for Ozone network reductions
  – Reductions in PAMS requirements
  – Special Purpose Monitoring data use moratorium extended to all criteria pollutants for two years
National Monitoring Strategy
Implementation Timetable

• 2005 Grant Cycle
  – Funding for 24 sites to have precursor gases CO, SO2, and NOy

• December 2005
  – Notice of proposed rulemaking expected
  – Information collection request (ICR) to support changes
  – Updating national monitoring strategy document to be more inclusive of other air monitoring programs and needs

• 2006 Grant Cycle
  – Funding for total of 35 sites to have precursor gases

• September 2006
  – Final rule incorporating National Core Network (NCore)

• 2007-2010
  – Implement NCore sites
Changes in 2006 Monitoring Allocation

• 2006 PM$_{2.5}$ Monitoring Budget was initially planned by:
  – Seeking input from Regional technical Contacts on changes to each States network
  – Prioritizing changes according to the National Monitoring Strategy
  – Pricing factors remained flat with exception of laboratory services contract and filter procurement
  – Staying within a national planning number of $42.5M
Changes in 2006 Monitoring Allocation

- One-time shift of 3.5 million from state/local PM monitoring operations to support advanced PM-related capabilities at 20 CASTNET sites

- We initially proposed a $0.5 million shift from PAMS operations into independent QA of NAAQS gases sites, now funded by EMAD
  - Deferring this shift to FY2007
  - Will use next 6 months to get more consensus on QA methods

- We initially proposed a $0.5 million shift from PAMS operations into national/regional scale data analysis, analysis tools, etc. for NAAQS gases
  - Deferring shift to FY2007
Changes in the 2006 PM$_{2.5}$ Monitoring Budget

• What decreased from 2005 to 2006?
  – Total costs for procurement of filters (per unit costs went up)
  – Some of the collocated IMPROVE and/or Speciation sites
  – Supplemental speciation sites
  – Capital for new precursor gas sites
  – Capital for data management upgrades
Changes in the 2006 PM$_{2.5}$ Monitoring Budget

• What increased from 2005 to 2006?
  – Continuous mass sites
  – Continuous speciation sites
  – Total number of precursor gas sites
  – Regional/National scale data analyses
  – Laboratory services contract for speciation

• What new areas were added for 2006
  – Ammonia gas monitoring and analyses
  – Independent audits for precursor gas sites
2007 PM$_{2.5}$ Monitoring Program Planning

• Plan is to include the $3.5M back into the direct funds for the States

• Input so far supportive of keeping Regional allocations about the same

• Will be working on specifics with EPA-State and local Steering Committee in January
  – Revisiting costs for PM$_{2.5}$ performance evaluation program
  – States are interested in opportunities to have Multi-State organizations do some of the data analyses support
Implementation of Precursor Gas Monitoring (PGM)

- Monitoring regulations
- Technology
  - Pilot of and training for precursor gas monitors 2005-2006
  - Need to develop methods for Ammonia, Nitric Acid, true Nitrogen Dioxide (NO₂)
  - Use of AIRNow to support sharing precursor gas, continuous speciation, and meteorological data
- Technical Guidance
  - TAD (Technical Assistance Document)
  - Method Fact Sheets
  - Standard Operating Procedures (SOPs)
  - Lab and field tests
PGM Funding

• Some initial funding for Precursor Gas Monitors at State and local agencies came from carryover PM$_{2.5}$ funds

• For 2005 and 2006 specific funding for precursor gas monitoring was planned into the Section 103 PM$_{2.5}$ monitoring grants

• **Note:** NH$_3$ plan is under review, more later
PGM Timetable

- 2004
  - OAQPS laboratory study

- 2005
  - OAQPS field Study
  - CASTNet 3 site pilot
  - State and local Agency Pilot
  - Training will be available at National Air Quality Conference in Feb 2006

- 2006
  - Additional State and Local Agencies come on line

- 2007
  - First full year of NCore (based on a final monitoring regulation in ’06)
  - Phase I of NCore implementation

- 2008
  - Phase II of NCore implementation
PM Standards Projected Milestones and Schedule

• PM NAAQS proposal and related proposals/analyses
  – NPR for Part 50: primary and secondary standards (fine and coarse particles) and appendices
  – NPR for Parts 53 and 58: ambient monitoring regulations
  – NPR for exceptional and natural events
  – ANPR on implementation issues
  – Regulatory Impact Analysis (RIA)

• Proposal signature by December 20, 2005
• Final notice by September 27, 2006
Speciation/IMPROVE Network Comparability

- Differences in sampling and analysis methods
- Differences in carbon measurements initially observed
- Concerns expressed by modeling and air quality data use community using both STN and IMPROVE carbon data
- Differences in x-ray fluorescence (XRF) uncertainties identified

Taken from work done by Phil Hopke and Eugene Kim at Clarkson Univ.
Speciation/IMPROVE Network Comparability

• Currently developing a plan to address inconsistency issues and changes to STN and SLAMS

• Striving to strike a balance between:
  – Cost to implement
  – Time to implement
  – Burden on State/Local agencies
  – Retention of monitoring data already generated by STN
  – Maintaining data quality for STN program objectives
  – Not ‘orphaning’ SLAMS
Speciation/IMPROVE Network Comparability

- Evaluating STN/IMPROVE comparison data to inform decision making process

- Thoughts so far:
  - Retain current STN/SLAMS sampling equipment for all species except carbon
  - Add IMPROVE module C to sample for carbon at STN and SLAMS
    - Provides identical sampling protocols to address filter face velocity differences
    - Reduces cost and time to implement
    - Allows for retention of ‘long-term’ record for other species
  - Adopt IMPROVE carbon sampling procedures, data processing protocols (including blank subtraction) and sample analysis by TOR through RTI (DRI is a subcontractor)
Speciation/IMPROVE Network Comparability

• Thoughts (continued):
  – Adopt IMPROVE XRF uncertainty calculations and data processing protocols for elements
  – Continue XRF round-robin comparison across labs, including UC Davis
  – Maintain current procedures for gravimetric mass and ions
  – Continue small number of long-term STN/IMPROVE collocated sites for future comparability assessments
  – Take cost out of the program by modifying the STN shipping procedures (reduction in weight)
Air Toxics Monitoring Program Components

NATTS (Section 103)
- 23 trend sites
- Measure long term program progress

Local-Scale Monitoring Projects (Section 103)
- Competitively awarded
- Limited duration
- Specific local-scale issues

Other Local programs (Section 105)
- S/L agency discretion

NATTS

Local-Scale Monitoring Projects

Other Local Programs

$6.5M

~$10M
Local-Scale Air Toxics Monitoring Projects

- 103 Grant Funds
- Middle and Neighborhood scale (.5km to 4 km) air quality impacts to study air toxics issues not addressed by NATTS
- 10 to 20 projects are expected to be funded each year in different locations
- Selected through open competition process
- FY2004 – $6.2 Million
  - 16 sites recommended for award from 49 proposals
  - Open competition following set criteria, also project types and regional considerations in selection process
  - All projects underway as of Jan 2005
Local-Scale Air Toxics Monitoring Projects

- FY2005 ~ $6.2 Million
  - Solicitation posted Jun 05; applications were due Aug 05
- Air Toxics Monitoring Advisory Committee (ATMAC) – representatives from OAQPS, Lead Regions, OTAQ and ORD
  - Each proposal reviewed and scored by committee members
  - Reviewers convened Oct 05 - recommendations complete
  - OAR Sr. Management reviewing - approval pending
  - Approved recommendations to Regions anticipated late Nov.
  - Nov 05 – Jan 06: Region/applicant negotiations, funds transfer to Regions, awards

- FY2006
  - Similar process and funding levels anticipated
    - Solicitation earlier than in 05
Proposed Rule on Exceptional Events

- Response to 2005 Transportation Bill amending Clean Air Act section 319
- Section 319 now defines exceptional event as an event that:
  - Affects air quality;
  - Is not reasonably controllable or preventable;
  - Is an event caused by human activity that is unlikely to recur at a particular location, or is a natural event; and
  - Is determined by the Administrator through the process established in the rule to be an exceptional event.
Key Requirements of the Safe, Accountable, Flexible, Efficient-Transportation Equity Act (SAFE-TEA)

• The exceptional event must be demonstrated by reliable and accurate data
• The State must show a “clear causal relationship” between NAAQS exceedances and the event
• There must be a public review process as part of an exceptional event determination
• EPA’s rule must set criteria and procedures for States to petition EPA to exclude data affected by exceptional events
SAFE-TEA Temporarily Preserves Existing Policies on Exceptional Events

• Until the effective date of the rulemaking, the following guidance remains in place:
  – Guidance on the Identification and use of air quality data affected by exceptional events (July 1986)
  – Areas affected by PM-10 natural events, (May 30, 1996)
  – Appendices I (8-hour ozone), K (PM-10), and N (PM$_{2.5}$) to part 50 of title 40, Code of Federal Regulations
Components of the Proposed Exceptional Events Rule

- Definitions and applicability
- Procedures for flagging, notification and demonstrations to justify exclusion of data
- Criteria for determining when data should be discounted or excluded
- Actions to protect public health
PM$_{10-2.5}$ Monitoring Update
Planning for PM$_{10-2.5}$

• The PM$_{10-2.5}$ monitoring program is expected to have:
  – **Data Quality Objectives** that define the qualitative and quantitative statements that clarify the monitoring objectives, define the appropriate type of data, and specify the tolerable levels of decision errors for the monitoring program
  – **Network Design** describing criteria for location of monitors, including scale of representativeness
    • Network will primarily focus on urban areas; however, some limited rural sites will be included in the network design
  – **Data Reporting and Assessment Activities**
Planning for PM$_{10-2.5}$

- The PM$_{10-2.5}$ monitoring program is expected to have:
  - **Sampling Methods** to achieve the monitoring objectives
    - FRMs - to serve as the method of comparison for all other methods
      - Approval of PM$_{10-2.5}$ continuous methods
      - Quality Assurance – performance evaluation audits with independent FRMs to determine bias
    - Federal Equivalent Methods (FEMs) - continuous monitors widely deployed as the primary method used in comparison to a possible daily standard
      - Equivalency criteria for these based on data quality objectives being developed for PM$_{10-2.5}$ monitoring program.
      - Quality Assurance – collocation with like methods to determine precision
    - Speciation samplers – Need filter-based methods to determine chemical composition
PM\textsubscript{10-2.5} Methods Update

- Multi-city field study of commercially available PM\textsubscript{10-2.5} technologies completed and reviewed by CASAC Technical Subcommittee in 2004
  - Included continuous methods for hourly data and filter-based methods to obtain integrated daily samples
- Additional field study in Phoenix completed spring 2005
  - Several technologies modified to improve performance prior to this study
- New field study being deployed in Birmingham, AL
- Meeting of the CASAC September 21-22, 2005 provided:
  - Peer review on a PM\textsubscript{10-2.5} Federal Reference Method (FRM)
  - Consultations on the evaluation of PM\textsubscript{10-2.5} field studies, equivalency criteria, and data quality objectives (DQOs)
PM$_{10-2.5}$ Methods Update

- Filter-based difference method (separate low-volume FRMs for PM$_{10}$ and PM$_{2.5}$)
  - Not expected to be widely deployed, but will serve as basis of comparison for approving continuous methods
- Continuous method evaluations have demonstrated high sample completeness, and good precision and correlation between methods
  - Biases do exist between methods; however, new studies may address this
- Samplers potentially usable for speciation
  - Coarse channel of filter-based dichotomous sampler
  - Analysis of PM$_{10}$ filter and subtraction of STN PM$_{2.5}$ data
  - Customized samplers specially designed for this purpose
Continuous PM$_{2.5}$ Data in AQS

- Recommendation to use parameter code 88101 only for those data used to meet NAAQS (PM$_{2.5}$ FRM/FEM)
- New parameter codes for:
  - Valid uncorrected or statistically corrected data *that is* within bias and correlation requirements
  - Valid raw uncorrected data *that is not* within bias and correlation requirements
  - FDMS, total atmospheric PM$_{2.5}$
  - FDMS, reference or ‘volatile’ channel only
Ambient Air Monitoring Steering Committee

• Decisions on monitoring program charge have to be made
• Want to find mutually satisfying approaches where possible
• Some practical issues are on the table for discussion
  – Implementation of the NAAMS and pace-of-change issues
  – Funding changes
  – Multiple purpose monitoring and network optimization
  – Technology issues
  – Quality Assurance and performance evaluations
  – Rulemaking schedule and substance
• We will be collaborating on these and other issues primarily through a new Ambient Air Monitoring Steering Committee (AAMSC)
Ambient Air Monitoring Steering Committee

S/L Representatives:

- George Allen (NESCAUM)
- Mary Stewart Douglas (Secretariat)
- Dirk Felton (NY)
- Mike Gilroy (Puget Sound)
- Mike Koerber (LADCO/MRPO)
- Bruce Louks (ID)
- Charles Pietarinen (NJ)
- Steve Spaw (TX)
- Eric Stevenson * (SF Bay Area)
- Tom Taminini and Jerry Campbell (Hillsborough Co., FL)
- Dick Valentinetti * (VT)
- Mel Zeldon (consultant)
- NPS representative – TBD
- Tribal representative – TBD

*Steering Committee Co-chair

EPA Members:

- Jerry Kurtzweg, OAR
- Doug Neeley, Region 4
- Peter Tsirigotis (OAQPS)
- Others according to topic, at appropriate level
Other

• National Ambient Air Monitoring Conference being planned for Fall 2006
• IMPROVE Network Assessment
• Preliminary semi-continuous speciation report on 5-site study