

**U.S. Environmental Protection Agency  
Clean Air Scientific Advisory Committee (CASAC)  
CASAC Ambient Air Monitoring & Methods (AAMM) Subcommittee  
Summary Meeting Minutes of CASAC Subcommittee Public Advisory Tele-  
conference Meeting**

**Monday, March 25, 2008 – 1:00 to 5:00 p.m. Eastern Time**

**SAB Staff Office, Washington DC**

**Advisory Meeting to Conduct a Consultation on Ambient Air Monitoring Is-  
sues related to the Lead National Ambient Air Quality Standards (NAAQS)**

Panel Members: See CASAC AAMM Subcommittee Roster – Appendix A

Agenda: See Meeting Agenda – Appendix B

Purpose: The purpose of this public teleconference meeting was for the CASAC Ambient Air Monitoring & Methods (AAMM) Subcommittee to conduct a consultation concerning ambient air monitoring issues related to the National Ambient Air Quality Standards (NAAQS) for lead, including issues associated with alternative lead indicators. This consultation is being held at the request of the Agency's Office of Air Quality Planning and Standards (OAQPS), within the Office of Air and Radiation (OAR).

Attendees:

Chair:	Dr. Armistead (Ted) Russell
CASAC Members:	Dr. Ellis Cowling Dr. Douglas Crawford-Brown Dr. Donna Kenski
Panel Members:	Mr. George Allen Mr. Bart Croes Dr. Delbert Eatough Mr. Eric Edgerton Mr. Henry (Dirk) Felton Dr. Philip Hopke Dr. Rudolf Husar Dr. Kazuhiko Ito Dr. Thomas Lumley Mr. Rich Poirot Dr. Kimberly Prather Dr. Jay Turner Dr. Warren White Dr. Yousheng Zeng Dr. Barbara Zielinska

EPA SAB Staff: Mr. Fred Butterfield, CASAC Designated Federal Officer (DFO)

Other EPA Staff: Mr. Kevin Cavender, OAR, OAQPS  
Dr. Kasey Kovalcik, ORD, NERL  
Dr. Karen Martin, OAR, OAQPS  
Dr. Deirdre Murphy, OAR, OAQPS  
Mr. Michael Papp, OAR, OAQPS  
Ms. Joann Rice, OAR, OAQPS  
Mr. Lewis Weinstock, OAR, OAQPS  
Dr. Robert Vanderpool, ORD, NERL  
Ms. Lydia Wegman, OAR, OAQPS

### Meeting Summary

The discussion followed the issues and general timing as presented in the meeting agenda (Appendix B).

### Convene Meeting, Call Attendance, Introduction and Administration

Mr. Fred Butterfield, Designated Federal Officer (DFO) for the Clean Air Scientific Advisory Committee, opened the teleconference meeting, called attendance, and welcomed all attendees. He noted the CASAC is a Federal Advisory Committee chartered under the Federal Advisory Committee Act (FACA) to provide advice and recommendations to the EPA Administrator, and that the Ambient Air Monitoring & Methods (AAMM) Subcommittee is a standing subcommittee of the Committee that provides its formal advice and recommendations to the Administrator via the CASAC. Consistent with FACA regulations, the deliberations of CASAC are held as public meetings and teleconferences for which advance notice is given in the *Federal Register*. The DFO is present at all such meetings to assure compliance with FACA requirements. He mentioned that there were no individuals who had registered with him in advance to provide oral public comments during today's teleconference. Mr. Butterfield said a transcript of this teleconference is not being taken. However, summary minutes were taken (by the DFO) for this teleconference meeting. These minutes will be certified by the CASAC AAMM Subcommittee Chair and posted on the SAB Web Site (<http://www.epa.gov/casac>) within 90 days after this meeting. Mr. Butterfield noted that all participating Subcommittee members had submitted documentation with respect to possible financial conflicts-of-interest or appearances of a lack of impartiality, which was reviewed by the SAB staff prior to the teleconference meeting and found to be satisfactory.

### Purpose of Meeting and Welcome

Dr. Armistead (Ted) Russell, CASAC AAMM Subcommittee Chair, welcomed Subcommittee Panel members and briefly stated the purpose of the meeting (see above).

### Overview Presentation on Lead NAAQS Monitoring Issues from OAQPS

Mr. Kevin Cavender and Ms. Joann Rice of OAQPS gave a brief status update concerning EPA's ongoing review of the NAAQS for lead, followed by a detailed overview presentation on the Agency technical documents on Lead NAAQS monitoring issues. The presentation materials from the EPA program office are posted on the "CASAC" page of the Agency's Technology Transfer Network (TTN) Web site at URL: <http://www.epa.gov/ttn/amtic/casacinf.html>, and are also found in hard-copy in the associated FACA file for this teleconference. AAMM Subcommittee members asked follow-up questions of the Agency staff both during and after their overview presentation.

### Public Comment Period

(There were no public commenters during this teleconference.)

### Summary of the CASAC AAMM Subcommittee Consultative Discussion on Lead NAAQS Monitoring Issues

The CASAC AAMM Subcommittee then discussed the four Agency documents covering the various aspects of potential ambient air monitoring requirements for the Lead NAAQS that are the subject of this consultation with EPA staff. Key points raised during this discussion for each Agency document include the following:

#### *"Options for Lead NAAQS Indicator: Monitoring Implications"*

- Subcommittee members affirmed the CASAC Lead Review Panel's recommendations that the Agency transition from lead in total suspended particulates (TSP-Pb) to lead in PM<sub>10</sub> (PM<sub>10</sub>-Pb) as the indicator for lead. It was acknowledged that there are reasons for maintaining TSP as the indicator, especially the large historical data-trend record for TSP. TSP-Pb could conceivably continue to be used in select, localized areas (in other words, used as the exception rather than the rule), particularly when the lower limit of the Lead NAAQS is being approached.
- EPA needs to develop an improved "Hi-Vol" monitor (*i.e.*, a high-volume ambient air sampler), since the current Hi-Vol device suffers from sampling variability.
- Members were not in favor of multiplying PM<sub>10</sub>-Pb data by a "scaling factor" to make the data "equivalent" to TSP-Pb, with one Subcommittee member commenting that scaling seemed trivial compared to making the Lead NAAQS more stringent, while another remarked that scaling was less effective than improving TSP sampling.
- One member raised a question about the reliability of the data reflected in Figure 2 ("Plot of source oriented Pb-TSP and Pb-PM<sub>10</sub> data"), and Agency staff indicated that they would provide the results of a roughly two-decade-old study conducted by the State of Montana concerning co-located PM<sub>10</sub>/Hi-Vol monitoring results to the DFO for transmittal to the members of the Subcommittee.

- Subcommittee members discussed issues regarding the sensitivity of high- and low-volume TSP to wind speed and direction, with one member noting that source-oriented monitors already depend on these.

*“Draft Federal Reference Method (FRM) and Federal Equivalent Method (FEM) Criteria for Lead in PM<sub>10</sub> (Pb-PM<sub>10</sub>)”*

- With respect to the question of using the X-Ray Fluorescence (XRF) analysis technique for the PM<sub>10</sub>-Pb FRM, one Subcommittee member commented that, while XRF may be appropriate for an FEM analytical method, ICP-MS (inductively-coupled plasma mass spectroscopy) or GFAA (graphite furnace atomic absorption) spectrometry should be used for the FRM analytical method since those methods do not have the potential for arsenic interference as does XRF.
- Similarly, another member commented that specifying XRF as the analysis method for the PM<sub>10</sub>-Pb FRM would cause analytical problems due to non-uniform loading and non-ideal filter loading densities. Instead, he recommended that ICP-MS be the analysis method for the FRM and for the Performance Evaluation Program (PEP) audit samples, since ICP-MS is more accurate and it does not require the filter to be uniformly-loaded. In addition, he noted that XRF should be designated as a cost-effective FEM.
- One Subcommittee member remarked that it is appropriate to use the low-volume PM<sub>10c</sub> FRM sampler as the Pb-PM<sub>10</sub> FRM sampler, noting that sequential PM<sub>10</sub> samplers should also be allowed, either as FRM or FEM samplers — adding that the dichotomous sampler is an obvious candidate for an FEM sampler for lead.
- Several members noted that there can be problems in areas with significant arsenic (As) concentrations, since there is an overlap (*i.e.*, spectral interference) in the As K $\alpha$  with one of the Pb L-lines.

*“Lead NAAQS Ambient Air Monitoring Network: Network Design Options Under Consideration”*

- One Subcommittee member commented that the focus for lead in ambient air should be *source* monitoring, adding that population monitoring is the least critical need. In addition, the data for roadway monitoring are too limited at present and likely inadequate to make a determination about the extent of monitoring needed there (though perhaps these will be available during the next review cycle for Pb NAAQS).
- This member also noted that it would be appropriate to waive the monitoring requirements for either source or non-source-oriented monitors if several years of monitoring data (either PM<sub>10</sub> or TSP) were to demonstrate compliance or if a comprehensive modeling analysis for a source shows no potential for exceedances. However, even under those circumstances a modicum of maintenance monitoring should be required for sources that have the potential for exceedances.
- Another Subcommittee member reiterated that the emphasis of the lead monitoring network should be placed on source monitoring, since point sources now dominate the na-

tional emissions. Since the single-monitor approach is rather crude, using the source emission rate as a “scaler” for the number of source-oriented monitoring sites makes sense. Population-weighted exposure could be considered as an alternative metric for scaling the number of monitors, which would require more monitors for those sources that result in higher population exposure. Population-oriented monitors — specifically, bringing the population into source monitoring — would also require more consideration.

- Still another Subcommittee member reiterated that emphasis should be placed on population monitoring and source-oriented monitoring, adding that it is important to consider historical industrial activities (*i.e.*, sources) rather than relying solely on contemporary emission inventories. As an example, he cited the significant source of PM<sub>10</sub>-Pb in East St. Louis, MO from the resuspension of Pb that was deposited from smelting activities that have been shutdown for several decades.
- Another member of the Subcommittee noted that EPA’s SCREEN3 model was used without considering building downwash, yet the modeling results were referred to as worst cases. Since consideration of building downwash could yield higher modeled impacts than the results in this memo, these results should not be characterized as conservative. This member also remarked using Pb-PM<sub>10</sub> will also be consistent with EPA’s New Source Review (NSR) permitting program.

*“Lead NAAQS Ambient Air Monitoring Network: Sampling Frequency Options Under Consideration”*

- Once Subcommittee member commented that, if the Pb NAAQS is based on a monthly average, the 1-in-6 day sampling schedule is not frequent enough. She recommended a 1-in-3 day sampling frequency, noting that the lower the NAAQS, the higher the sampling frequency needed. This member remarked that it is appropriate to relax the sampling frequency in areas of low Pb concentration to 1-in-6 days if all 12 monthly averages in a calendar year are lower than 30% of the Pb NAAQS.
- Another Subcommittee member questioned the Pb NAAQS averaging time, noting that 1-in-6-day sampling clearly will not produce a reliable estimate of the monthly average. (However, EPA staff pointed-out that this was the consensus recommendation of the CASAC Lead Review Panel.)

EPA staff then had some follow-up questions for the Subcommittee concerning monitoring implications, specifically the role that a low-volume (“Lo-Vol”) TSP monitor could play with regard to what might be missed by the PM<sub>10</sub>-Pb monitor. When asked if Subcommittee members had any experience with Lo-Vol sampler inlets, one member replied that a Lo-Vol TSP head was commercially-available. A brief discussion on these issues followed.

Summary and Next Steps

Dr. Russell thanked the members of the Subcommittee for their participation and asked them to provide their initial or revised/updated individual written comments to him and Mr. Butterfield, DFO. These will be included as an appendix to the *pro forma* letter being sent to the EPA Administrator informing him that this teleconference consultation took place. Members' individual written comments are requested as soon as practicable, but by no later than close of business on Tuesday, April 1.

Mr. Butterfield also thanked everyone on the conference call for their participation, and the DFO adjourned the meeting at approximately 4:15 p.m.

Respectfully Submitted:

Certified as True:

/s/

/s/

*Fred A. Butterfield, III*

*Armistead (Ted) Russell, Ph.D.*

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Fred A. Butterfield, III  
CASAC DFO

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Armistead (Ted) Russell, Ph.D., Chair  
CASAC AAMM Subcommittee Chair

Date: April 21, 2008

## Appendix A – Roster of the CASAC AAMM Subcommittee

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### U.S. Environmental Protection Agency Clean Air Scientific Advisory Committee (CASAC) CASAC Ambient Air Monitoring & Methods (AAMM) Subcommittee

#### CASAC MEMBERS

**Dr. Armistead (Ted) Russell (Chair)**, Georgia Power Distinguished Professor of Environmental Engineering, Environmental Engineering Group, School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, GA

**Dr. Ellis Cowling**, University Distinguished Professor At-Large, Emeritus, Colleges of Natural Resources and Agriculture and Life Sciences, North Carolina State University, Raleigh, NC

**Dr. Donna Kenski**, Director of Data Analysis, Lake Michigan Air Directors Consortium (LADCO), Rosemont, IL

#### SUBCOMMITTEE MEMBERS

**Mr. George Allen**, Senior Scientist, Northeast States for Coordinated Air Use Management (NESCAUM), Boston, MA

**Dr. Judith Chow**, Research Professor, Desert Research Institute, Air Resources Laboratory, University of Nevada, Reno, NV

**Mr. Bart Croes**, Chief, Research Division, California Air Resources Board, Sacramento, CA

**Dr. Kenneth Demerjian\***, Professor and Director, Atmospheric Sciences Research Center, State University of New York, Albany, NY

**Dr. Delbert Eatough**, Professor of Chemistry, Emeritus, Chemistry and Biochemistry Department, Brigham Young University, Provo, UT

**Mr. Eric Edgerton**, President, Atmospheric Research & Analysis, Inc., Cary, NC

**Mr. Henry (Dirk) Felton**, Research Scientist, Division of Air Resources, Bureau of Air Quality Surveillance, New York State Department of Environmental Conservation, Albany, NY

**Dr. Philip Hopke**, Bayard D. Clarkson Distinguished Professor, Department of Chemical Engineering, Clarkson University, Potsdam, NY

**Dr. Rudolf Husar**, Professor, Mechanical Engineering, Engineering and Applied Science, Washington University, St. Louis, MO

**Dr. Kazuhiko Ito**, Assistant Professor, Environmental Medicine, School of Medicine, New York University, Tuxedo, NY

**Dr. Thomas Lumley**, Associate Professor, Biostatistics, School of Public Health and Community Medicine, University of Washington, Seattle, WA

**Dr. Peter McMurry**,\* Professor, Department of Mechanical Engineering, Institute of Technology, University of Minnesota, Minneapolis, MN

**Mr. Richard L. Poirot**, Environmental Analyst, Air Pollution Control Division, Department of Environmental Conservation, Vermont Agency of Natural Resources, Waterbury, VT

**Dr. Kimberly Prather**, Professor, Department of Chemistry and Biochemistry, University of California, San Diego, La Jolla, CA

**Dr. Jay Turner**, Visiting Professor, Crocker Nuclear Laboratory, University of California - Davis, Davis, CA

**Dr. Warren H. White**, Research Professor, Crocker Nuclear Laboratory, University of California - Davis, Davis, CA

**Dr. Yousheng Zeng**, Air Quality Services Director, Providence Engineering & Environmental Group LLC, Providence Engineering and Environmental Group LLC, Baton Rouge, LA

**Dr. Barbara Zielinska**, Research Professor, Division of Atmospheric Science, Desert Research Institute, Reno, NV

#### **SCIENCE ADVISORY BOARD STAFF**

**Mr. Fred Butterfield**, Designated Federal Officer, 1200 Pennsylvania Avenue, N.W., Washington, DC, 20460, Phone: 202-343-9994, Fax: 202-233-0643 ([butterfield.fred@epa.gov](mailto:butterfield.fred@epa.gov)) (Physical/Courier/FedEx Address: Fred A. Butterfield, III, EPA Science Advisory Board Staff Office (Mail Code 1400F), Woodies Building, 1025 F Street, N.W., Room 3604, Washington, DC 20004, Telephone: 202-343-9994)

\*Dr. Demerjian and Dr. McMurry did not participate in this CASAC AAMM Subcommittee activity.

## Appendix B – Meeting Agenda

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**U.S. Environmental Protection Agency  
Clean Air Scientific Advisory Committee (CASAC)  
CASAC Ambient Air Monitoring & Methods (AAMM) Subcommittee**

**Public Advisory Teleconference Meeting**

**Tuesday, March 25, 2008 – 1:00 to 5:00 p.m. Eastern Time (EDT)**

**Advisory Meeting to Conduct a Consultation on Ambient Air Monitoring Issues related to the Lead National Ambient Air Quality Standards (NAAQS)**

Meeting Agenda

1:00 p.m.	<b>Convene Teleconference; Call Attendance; Introductions and Administration</b>	Mr. Fred Butterfield, CASAC DFO
1:10 p.m.	<b>Purpose of Meeting</b>	Dr. Ted Russell, Chair
1:15 p.m.	<b>Overview and status of Lead NAAQS review and overview of Agency technical documents on Lead NAAQS monitoring issues from EPA's Office of Air Quality Planning &amp; Standards</b>	Mr. Kevin Cavender & Ms. Joann Rice, OAQPS
1:45 p.m.	<b>Public Comment Period</b>	Mr. Butterfield (Facilitator)
2:15 p.m.	<b>Panel Members' Discussions</b>	CASAC AAMM Subcommittee
	<u>Document/Discussion Topic</u>	<u>Lead Discussants</u>
	<ul style="list-style-type: none"> <li>• <b>“Options for Lead NAAQS Indicator: Monitoring Implications”</b></li> <li>• <b>“Draft Federal Reference Method (FRM) and Federal Equivalent Method (FEM) Criteria for Lead in PM<sub>10</sub> (Pb-PM<sub>10</sub>)”</b></li> <li>• <b>“Lead NAAQS Ambient Air Monitoring Network: Network Design Options Under Consideration”</b></li> <li>• <b>“Lead NAAQS Ambient Air Monitoring Network: Sampling Frequency Options Under Consideration”</b></li> </ul>	Mr. Rich Poirot & Dr. Ellis Cowling  Dr. Phil Hopke & Mr. George Allen  Dr. Donna Kenski & Dr. Rudolf Husar  Dr. Barbara Zielinska & Dr. Warren White
4:45 p.m.	<b>Summary and Next Steps</b>	Dr. Russell
5:00 p.m.	<b>Adjourn Meeting</b>	Mr. Butterfield