

Summary Minutes of the
Clean Air Scientific Advisory Committee
Particulate Matter Review Panel
Public Meeting
Carolina Inn, Chapel Hill, North Carolina
October 5 - 6, 2009

Committee Members:

Dr. Jonathan Samet, Chair
Dr. Lowell Ashbaugh
Professor Ed Avol
Dr. Joseph Brain
Dr. Wayne Cascio
Dr. Ellis Cowling
Dr. James Crapo
Dr. Christopher Frey
Dr. Joseph Helble
Dr. Rogene Henderson
Dr. Helen Suh
Dr. William Malm
Mr. Tom Moore
Dr. Robert Phalen
Dr. Kent Pinkerton
Mr. Richard Poirot
Dr. Ted Russell
Dr. Frank Speizer
Dr. Sverre Vedal

Date and Time:

October 5, 2009: 8:00 am – 6:00 pm
October 6, 2009: 8:00 am – 4:00 pm

Purpose:

The Clean Air Scientific Committee Review Panel (CASAC) reviewed three documents: *Integrated Science Assessment for Particulate Matter (ISA, Second External Review Draft, July 2009)* and *Particulate Matter Urban Focused Visibility Assessment (September 2009)* and *Risk Assessment to Support the Review of the PM Primary National Ambient Air Quality Standards (September 2009)*.

SAB Staff:

Dr. Holly Stallworth, Designated Federal Officer

Other EPA Staff:

Mary Ross, EPA
Zachary Pekar, EPA
James Brown, EPA
Marc Pitchford, NOAA
Karen Martin, EPA

Harvey Richmond, EPA
Barbara Buckley, EPA
Bryan Hubbell, EPA
Debra Walsh, EPA
Vicki Sandiford, EPA
Beth Hassett-Sipple, EPA
Tim Benner, EPA
Doug Johns, EPA
Connie Meachan, EPA
William Bradley, EPA
Neal Frank, EPA
Neal Fann, EPA
Pradeep Rajan, EPA
Meredith Lassiter, EPA
Amy Lamson, EPA
Erin Hines, EPA
Jen Richmond-Bryant, EPA
Ellen Kirrane, EPA
Tom Long, EPA
Molini Patel, EPA
Tom Luber, EPA
Jason Sacks, EPA
Dennis Kotchmar, EPA
Lisa Vinikoor, EPA
Christal Bowman, EPA
Steven Dutton, EPA
Erin Hines, EPA
Lindsay Stanek, EPA
Debra Walsh, EPA
Bryan Hubbell, EPA
James Brown, EPA
Jeff Arnold, EPA
William Wilson, EPA
David Svendsgaard, EPA
Steve Silverman, EPA
Lydia Wegman, EPA

Others:

Cynthia Langworthy, Hunton & Williams
Julie Goodman, Gradient
Anne Smith, CRA
Ted Steichen, American Petroleum Institute
Nakia Simon, Chrysler
Ellen Post, Abt Associates
Dave Heinold, American Petroleum Institute
Deck Leland, Stratus Consulting

Wig Zamore, Mystic View Task Force
John Richards, Air Control Techniques
Bruce Copley, Exxon Mobil

Attachments:

The meeting agenda, charge questions, presentations, public comments, and panelists' pre-meeting written comments may be found posted at the meeting website:
<http://yosemite.epa.gov/sab/sabproduct.nsf/bf498bd32a1c7fd85257242006dd6cb/9ee58fa24e1f393f8525759300540310!OpenDocument&Date=2009-10-05>

Meeting Summary

The discussion followed the issues and general timing as presented in the meeting agenda posted at the URL above.

MONDAY, OCTOBER 5, 2009

Opening of Public Meeting

Dr. Holly Stallworth, Designated Federal Officer (DFO), opened the meeting with a statement that the CASAC Particulate Matter Review Panel is a federal advisory committee whose meetings and deliberations meet the requirements of the Federal Advisory Committee Act. Dr. Samet reviewed the agenda and purpose of the meeting and each member introduced himself/herself. Ms. Lydia Wegman of EPA Office of Air Quality Planning and Standards then presented the schedule for the PM review as shown in her presentation slides ("Schedule and Development of Policy Assessment for PM NAAQS") posted at the above URL. Ms. Wegman explained that this review would follow the process outlined in Administrator Jackson's letter to CASAC of May 21, 2009. Ms. Wegman, along with Beth Hassett-Sipple also of OAQPS, described the preliminary draft Policy Assessment (PA) as a very preliminary document that was being released for informational purposes only to provide CASAC with a view of the structure of the PA. Following Ms. Wegman, Dr. Mary Ross and other members of the EPA National Center for Environmental Assessment (NCEA) presented highlights of the Second Draft ISA. This presentation, entitled "ORD-NCEA Briefing on the Second Draft ISA" and posted on the meeting website, was a general overview of the entire ISA, emphasizing changes that had been made in response to CASAC's comments on the first draft ISA. In particular, two causality determinations for PM_{2.5} were highlighted; cardiovascular effects were determined to be "causal" and cancer effects were described as "suggestive." As described in the presentation, other causality determinations were changed for PM_{10-2.5} and ultrafine PM. NCEA also emphasized the implementation of the Health and Environmental Research Online (HERO) electronic system for identifying, characterizing and synthesizing scientific studies. NCEA was asked why particles from tobacco smoking were not included in the ISA.

Dr. John Richards of the National Stone, Sand & Gravel Association, presented public comments challenging EPA's conclusion that new studies provide evidence of harm from exposure to crustal material under the current PM₁₀ standard. Dr. Julie Goodman, on behalf of the American Petroleum Institute, emphasized uncertainty and commented that the ISA did not adequately evaluate epidemiological studies that support the a linear concentration-response function and the assumption of no threshold. Mr. Robert Wagner presented comments on behalf of the International Dark Sky Association. Mr. Wagner challenged EPA's use of daytime only metrics for visibility and discussed the role of PM in reducing nighttime darkness and the ability to see the stars at night. Mr. George Wolf, on behalf of the Alliance of Automobile Manufacturers, presented comments that challenged EPA's conclusions about coarse PM, specifically EPA's use of the June 2009 study by Zanobetti and Schwartz which associates current ambient concentrations of PM_{10-2.5} to premature mortality. All public comments are posted on the meeting website.

Following public comments, panelists began their discussion of charge questions. They first discussed the need for more information on the correlation of PM₁₀ with fine PM and PM_{10-2.5} concentrations in order to understand the role PM₁₀ is playing. Panelists expressed different views on whether the all-cause mortality determination for PM_{2.5} ("likely") was consistent with the "causal" determination for cardiovascular effects. One panelist emphasized the need to use the regional differences in PM size and effects to tease out the role played by PM_{10-2.5}. Panelists seemed to agree that the document is not sufficiently clear on how it is going to use the PM₁₀ information. Different opinions were offered on EPA's decision to change the causal determination for ultrafine PM to "suggestive" with respect to cardiovascular effects. The Panel also voiced different opinions about EPA's causal determination for cancer and PM_{2.5} ("suggestive"). One panelist spoke about the need to assess overall public health impacts of regulation, including economic impacts and the role that income plays in public health, but it was noted that such a broad analysis was beyond CASAC's legal purview.

On the subject of the ISA's treatment of susceptible or vulnerable populations, panelists expressed different views about EPA's decision to discontinue the distinction between "susceptible" and "vulnerable" populations. Rather than using the term "vulnerability" to describe external factors like location and socioeconomic status and the term "susceptible" to refer to genetic or developmental factors like race, gender, age or preexisting disease states, EPA had, instead, decided to lump together these internal and external characteristics together under the term "susceptible." Panelists had mixed views on this approach as well as on the length of the ISA. While some panelists criticized the ISA's length, others found a reasonable balance between the body of the text and the appendices and noted the substantial body of evidence reviewed.

On the ISA's treatment of welfare effects, panelists expressed support for newly added materials on optical measurement methods and a "PM light extinction" indicator while noting the lack of analysis of optical measurement data, and in particular, measurements using nephelometers and aethalometers. Panelists called for a better demonstration that there are currently viable, field-tested monitoring techniques to implement the proposed

optical standard. Panelists noted that the new materials added on aerosol effects on climate enhanced the ISA but noted that most data relating emissions to climate effects was global rather than U.S. specific.

After completing its discussion on the charge questions on the ISA, panelists heard a presentation on the Urban Focused Visibility Assessment (UFVA) from Dr. Marc Pitchford of OAQPS. Slides from the “Overview of the UFVA” are posted on the meeting website. Dr. Dave Heinold presented public comments on behalf of the American Petroleum Institute challenging EPA’s method for estimating light extinction from PM mass concentration and relative humidity data and highlighting the role that NO₂ plays in urban visibility. Dr. Anne Smith presented comments on behalf of the Utility Air Regulatory Group, questioning EPA’s interpretation of visual air quality preference studies.

In discussing the UFVA charge questions, one panelist expressed concern that the exclusive focus on urban areas was too restrictive, particularly with EPA’s use of the metropolitan statistical area data. Panelists requested clarification that the secondary PM NAAQS applies to all regions of the U.S., with further visibility protections identified for Class 1 federal areas under the Regional Haze Rule. There was general support for EPA’s decision to reanalyze and aggregate pre-existing visibility preference studies to inform the selection of candidate protection levels. It was noted that a logistic model could be used to model the data and formally gauge whether the values derived from the various preference studies were statistically different from each other. Panelists supported EPA’s use of the IMPROVE algorithm to estimate light extinction based on PM concentrations, relative humidity and other factors. One panelist criticized EPA’s stipulation in its visibility preference studies that health effects be set aside when evaluating visibility. Panelists generally agreed with EPA’s choice of a one hour averaging time while asking that EPA provide more support for its choice of the 90th percentile. The suggestion was made that EPA consider selecting the 90th or 95th percentile extinction for all days (only daylight hours) without concern for daily maximums. It was noted that preference studies show that at some point, poor visibility is not acceptable to the public. When pondering the possibility of different regional standards for visibility, a discussion on EPA’s Regional Haze Rule followed. EPA representatives explained that it had a specific congressional mandate to protect Class 1 areas near national parks whereas the Clean Air Act required a national standard for criteria pollutants. On the whole, panelists applauded EPA’s rationale for moving toward a PM light extinction measurement rather than PM mass concentration as the indicator for a secondary PM NAAQS.

TUESDAY, OCTOBER 6, 2009

On the second day of the meeting, the Panel continued its discussion of the UFVA. Panelists expressed support for EPA’s proportional rollback method. Panelists generally agreed with EPA’s approach for selecting candidate protection levels and estimating policy relevant background levels of particulate matter, however panelists expressed mixed views as to whether a daytime only standard was appropriate. Panelists generally

supported EPA's use of the 50th percent acceptability criteria for VAQ levels across the four study areas as an appropriate approach. It was noted that EPA should recognize the welfare benefits associated with improvements across all parts of the visibility spectrum, e.g. a shift from "good" to "excellent" VAQ. Several panelists suggested lowering the relative humidity screen to 90%.

Panelists expressed the view that the UFVA's discussion of monitoring site selection was incomplete and that some discussion of requirements for monitor design should be included if the UFVA document was going to address the monitoring issue. Panelists noted that a PM light extinction secondary standard would likely spur the development of better monitoring systems. The panel commented that in this situation, as in other contexts, regulations become the drive for the development of monitoring systems.

Panelists discussed the limitations of a uniform national standard for all urban areas across the whole U.S. Agency representatives pointed out that the Clean Air Act required a national standard. Panelists noted that the UFVA could be more consistent with the health-based Risk Assessment in using a framework for dealing with variability and uncertainty, such as the WHO (2008) framework. One panelist cautioned that it was important to balance the advocacy of future research needs with EPA's stated confidence in using the best currently information to select a secondary NAAQS standard.

Following a presentation from Dr. Zack Pekar of EPA's Office of Air Quality Planning and Standards on the *Risk Assessment to Support the Review of the PM NAAQS – External Review Draft* (posted at the meeting website), Dr. Julie Goodman presented public comments on behalf of the American Petroleum Institute. Dr. Goodman noted that there were significant uncertainties associated with the concentration-response function, confounding and effect modification, measurement error and the heterogeneity of PM_{2.5}.

The Panel then turned its attention to the charge questions on the risk assessment. Questions were raised about EPA's decision to do a risk assessment for PM_{2.5} only. In response, EPA said commented that the monitoring network for coarse PM that constrains their analysis. Panelists stressed the need to defend any PM₁₀ standard that might be retained or modified. One panelist offered the opinion that the entire assumption of causality between PM and health effects was incorrect. EPA said that the absence of PM₁₀ from the risk assessment did not imply that PM₁₀ regulations would be dropped. In fact, all evidence, both qualitative and quantitative, would be evaluated in the Policy Assessment. It was noted that regional differences were very important with regard to PM₁₀ because of its prevalence in dryer sections of the country. On the subject of reproductive effects, the observation was made that with 2 million births per year, a small health effect that impacts such a large number of people would constitute a major public health concern and hence reproductive effects of PM_{2.5} deserved more attention.

Panelists expressed support for EPA's multi-tiered approach to characterizing uncertainty based on the World Health Organization model. Panelists also expressed support for EPA's qualitative characterization of uncertainties. It was noted that the qualitative assessment of uncertainty could be compared to the quantitative estimates of uncertainty

from the sensitivity analyses to see if they are consistent. Some panelists expressed some concern that microenvironmental-based population exposure estimation (as proposed in the *Scope and Methods Plan*) had been dropped from the risk assessment; however, one panelist suggested incorporating some simpler aspects of exposure modification. Panelists supported EPA's presentation of concentration-response functions while noting the need for a comparison of results based on different concentration-response functions.

With respect to EPA's four combinations of 24-hour and annual alternative standard levels, panelists noted the conspicuous absence of PM₁₀. One panelist noted that there was little practical difference between 12 µg/m³ and 13 µg/m³. Another panelist said substantial risks could be found at levels below the alternative standards selected for analysis. Panelists expressed support for the approach used to demonstrate how the chosen urban areas represent the nation as a whole; however, the use of only one endpoint for the national scale assessment was of some concern. Panelists pondered the possibility of encouraging incremental progress in air quality as a regulatory approach as compared to counting "exceedances."

In discussing the preliminary draft Policy Assessment, panelists commented with concern about the absence of conclusions and recommendations for primary and secondary standards. Panelists also criticized the repetitive nature of the Policy Assessment, citing redundancy with large sections of the ISA, as the draft provided largely reflected text taken from the other PM documents. EPA representatives explained that CASAC's consideration of the preliminary draft in this meeting would not be counted as a CASAC review. The topic of monitoring again was discussed again, and EPA representatives said the Policy Assessment will only discuss monitoring to the extent that it relates to implementation of a standard. EPA said that typically the Ambient Air Monitoring and Methods Subcommittee reviewed technical plans for monitoring but that plans for review of PM monitoring plans had not yet been decided.

Dr. Stallworth requested that draft consensus responses to charge questions be submitted by October 13, 2009. The three draft letters would be circulated for comment by the panel before draft are posted on the CASAC website. A public teleconference would be held on November 12, 2009 to discuss the three draft letters.

Respectfully Submitted:

Holly Stallworth, Ph.D. /s/
Designated Federal Officer

Certified as True:

Jonathan Samet, M.D., M.S. /s/
Chair

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by Committee member during the course of deliberations within the meeting. Such ideas, suggestions and deliberations do not necessarily reflect consensus advice from the panel members. The reader is cautioned to not rely on the minutes to represent final, approved, consensus advice and recommendations offered to the Agency. Such advice and recommendations may be found in the final advisories, commentaries, letters or reports prepared and transmitted to the EPA Administrator following the public meetings.