



July 1, 2010

**MEMORANDUM**

**SUBJECT:** CASAC Review of the *Policy Assessment for the Review of the Particulate Matter National Ambient Air Quality Standards – Second External Review Draft*

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**TO:** Holly Stallworth  
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Attached is the draft document, *Policy Assessment for the Review of the Particulate Matter National Ambient Air Quality Standards - Second External Review Draft* (Policy Assessment), prepared by the Environmental Protection Agency's (EPA) Office of Air Quality Planning and Standards (OAQPS) staff as part of EPA's ongoing review of the national ambient air quality standards (NAAQS) for particulate matter (PM). This document will be the focus of a review by the Clean Air Scientific Advisory Committee (CASAC) Particulate Matter Review Panel (the Panel) on July 26-27, 2010.

The second draft Policy Assessment presents considerations and conclusions relevant for EPA's review of the current primary (health-based) standards and secondary (welfare-based) standards for both fine and coarse particles. This draft document draws upon the evidence and information assessed and presented in the final *Integrated Science Assessment for Particulate Matter* (ISA) prepared by EPA's National Center for Environmental Assessment and two final assessment documents prepared by OAQPS, the *Quantitative Health Risk Assessment for Particulate Matter* (Risk Assessment) and the *Urban-Focused Visibility Assessment for Particulate Matter* (Visibility Assessment). These three final documents reflect consideration of comments from the Panel and the public on earlier drafts.

The second draft Policy Assessment reflects consideration of comments from the Panel, as well as public comments, on the first draft Policy Assessment, which was reviewed by the Panel during teleconferences on April 8-9 and May 7, 2010. The main comments from the Panel on the first draft Policy Assessment were provided to us in a May 17, 2010 letter (Samet, 2010).<sup>1</sup> These comments, and the changes made in the second draft Policy Assessment in response to them, are summarized in Attachment 1.

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<sup>1</sup>Samet, J. (2010). Letter from Clean Air Scientific Advisory Committee to the Honorable Lisa P. Jackson, Administrator, US EPA. CASAC Review of Policy Assessment for the Review of the PM NAAQS – First External Review Draft (March 2010). May 17, 2010.

We will take comments from the Panel and the public on the second draft Policy Assessment into consideration in preparing a final Policy Assessment, which we plan to release in September, 2010. Our review of the PM NAAQS will conclude with Agency rulemaking. Our current schedule anticipates that proposed and final rules will be signed in February 2011 and October 2011, respectively.

### **Document Availability**

The second draft Policy Assessment is being made available to the Panel in the form of the attached electronic file, which we request that you forward to members of the Panel. This document is also available on the EPA website:

[http://www.epa.gov/ttn/naaqs/standards/pm/s\\_pm\\_2007\\_pa.html](http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_2007_pa.html). Printed copies of this document will be sent to members of the Panel via Federal Express.

### **Charge to the Panel**

In their review, we ask the Panel members to focus on the charge questions listed in Attachment 2, though we would appreciate comments on other topics as well.

We look forward to discussing this second draft Policy Assessment with the Panel at our upcoming meeting in July. Should you have any questions regarding this draft document, please contact Ms. Beth Hassett-Sipple (919-541-4605; email [hassett-sipple.beth@epa.gov](mailto:hassett-sipple.beth@epa.gov)).

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## Attachment 1

### CASAC comments on first draft PM Policy Assessment and responses to those comments

The CASAC Panel's comments and recommendations on the first draft of the PM Policy Assessment, as well as changes made in the second draft in response to those comments, are summarized below. Overarching comments and recommendations are summarized below, followed by comments and recommendations on chapters 2 through 4.

#### Overarching comments and recommendations

The Panel made several overarching comments and recommendations, including:

- The document should be streamlined by relying more on the underlying scientific and technical documents and editing to reduce redundancy.
- The staff's approach to reaching conclusions on policy options should be more explicit.

In response to these comments, we have made extensive edits throughout the second draft Policy Assessment to streamline the document by reducing redundancy and by relying more extensively on references to the underlying scientific and technical documents. We have clarified the approaches to reviewing the standards (sections 2.1.3, 3.1.4, 4.1.3) and have added figures framing these approaches (Figures 2-1, 3-1, 4-1). Throughout the document we have more explicitly articulated the application of these approaches in reaching staff conclusions on the current and potential alternative standards. We have also added an executive summary and added sections discussing areas for future research and data collection (sections 2.5, 3.5, 4.5).

#### Chapter 2 (Primary Standards for Fine Particles)

The Panel expressed agreement with a number of preliminary staff conclusions in the first draft Policy Assessment, expressing support for the following:

- Considering revisions to the current PM<sub>2.5</sub> primary standard to provide increased public health protection;
- Retaining PM<sub>2.5</sub> as the indicator for fine particles, while also encouraging research to provide information for future NAAQS reviews to inform our consideration of alternative size fractions as well as PM<sub>2.5</sub> components and sources;
- Retaining annual and 24-hour averaging times;
- Revising the form of the annual standard to eliminate spatial averaging; and
- Considering a suite of standard levels in which the annual standard would be the "generally controlling" standard to provide primary protection for both long- and short-term PM<sub>2.5</sub> exposures, in conjunction with a 24-hour standard set to provide supplemental protection.

Changes made in chapter 2 in the second draft Policy Assessment were primarily focused on streamlining the chapter as well as on improving and clarifying the approach for translating the epidemiological evidence into a basis for staff conclusions on the current and potential alternative standards. We have added a number of figures that summarize the available epidemiological evidence and air quality information (Figures 2-2 to 2-9). We have also conducted air quality analyses to inform our discussion of form and level. For the annual standard, we conducted analyses that focused on understanding potential impacts on susceptible populations, including low income populations and minorities (section 2.3.3.1). For the 24-hour standard, we conducted air

quality analyses to understand the differences in 98<sup>th</sup> versus 99<sup>th</sup> percentile forms (section 2.3.3.2) and to inform staff conclusions on level of the 24-hour standard (section 2.3.4.1).

### Chapter 3 (Primary Standard for Coarse Particles)

In reviewing the first draft PM Policy Assessment, the Panel expressed support for the following:

- Considering revisions to the current PM<sub>10</sub> primary standard to provide increased public health protection against effects associated with exposures to PM<sub>10-2.5</sub>;
- Retaining PM<sub>10</sub> as the indicator for thoracic coarse particles, while also encouraging research to provide information for future NAAQS reviews to inform consideration of alternative sizes (e.g., PM<sub>10-2.5</sub>) as well as components and sources;
- Retaining 24-hour averaging time; and
- Considering revising the form to a 98<sup>th</sup> percentile form.

We have made important revisions in the second draft Policy Assessment to the discussions of the current and potential alternative standards. We have added figures summarizing the available epidemiological evidence and air quality data to the discussion on adequacy of the current standard (Figures 3-2 and 3-3). We included a new discussion of potential alternative standard levels and staff conclusions. To facilitate this discussion, we added figures summarizing the available epidemiological evidence and air quality data (Figures 3-5 and 3-6) and we have conducted additional PM<sub>10</sub> air quality analyses (Figure 3-7, Table 3-2). In addition, we have expanded the discussion of considerations related to the standard indicator (section 3.3.1), including an analysis of PM<sub>10</sub> and PM<sub>10-2.5</sub> air quality (Figure 3-4), and we have expanded the discussion of standard form (section 3.3.3).

### Chapter 4 (Secondary Standard for PM-related Visibility)

The Panel expressed agreement with a number of staff conclusions included in the first draft Policy Assessment, including:

- Considering revisions to the current PM<sub>2.5</sub> standards to provide increased protection against PM-related visibility impairment;
- A one-hour averaging time, including daylight hours only, and excluding hours with relative humidity above 90%; and
- Considering a PM<sub>2.5</sub> light extinction indicator.

In addition to the edits made to address the Panel's overarching comments, we have addressed specific comments on chapter 4. The Panel recognized potential benefits in moving to a PM light extinction indicator as well as the lack of monitoring capabilities to support direct PM light extinction measurements at this time, and supported consideration of an alternative approach. In response, we have developed and evaluated an approach that uses an indicator based on using speciated PM<sub>2.5</sub> mass to calculate light extinction that allows the coupling of the PM light extinction indicator with PM air quality measurements based on the currently available PM mass monitoring infrastructure (Appendix B and section 4.3.1). In addition, in response to the Panel's interest in additional analyses to better illustrate and evaluate the similarities and differences between the wide range of alternative indices and forms of the standard (e.g., 1-hour daily maximum versus all daylight hours) being considered, and the policy implications of these options, we have incorporated an assessment of the PM species components that contribute to the high value days selected by different combinations of indices/forms (Appendix C).

## **Attachment 2**

### **Charge to the Panel in Reviewing the Second Draft PM Policy Assessment**

Our charge to the Panel in reviewing the second draft Policy Assessment focuses on chapters 2 through 4. We ask the Panel to focus on the following charge questions, though we would appreciate comments on other topics as well.

#### Chapter 2 (Primary Standards for Fine Particles)

##### **1. Current Approach (section 2.1.3):**

- a. What are the Panel's views on the staff's approach to translating the available epidemiological evidence, risk information, and air quality information into the basis for reaching conclusions on the adequacy of the current standards and on alternative standards for consideration?
- b. Has staff appropriately applied this approach in reviewing the adequacy of the current standards (section 2.2) and potential alternative standards (section 2.3)?

##### **2. Form of the Annual Standard (section 2.3.3.1):**

- a. What are the Panel's views on the additional analyses conducted to characterize the potential for disproportionate impacts on susceptible populations, including low income groups and minorities associated with spatial averaging allowed by the current annual standard?
- b. In light of these analyses, what are the Panel's views on staff's conclusion that the form of the annual standard should be revised to eliminate spatial averaging?

##### **3. Alternative Levels (section 2.3.4):** What are the Panel's views on the following:

- a. The insights that can be gained into potential alternative standard levels by considering:
  - i. Confidence bounds on concentration-response relationships?
  - ii. Different statistical metrics that characterize air quality distributions from multi-city epidemiological studies?
- b. Potential alternative annual standard levels based on composite monitor distributions versus maximum monitor distributions?
- c. Use of risk information in informing staff conclusions on alternative annual and 24-hour standard levels, including approaches used to assess overall confidence and potential bias in the risk estimates?
- d. Staff's conclusion that alternative annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$  are most strongly supported by the available evidence and risk-based information?
- e. Staff's approach of focusing on peak-to-mean ratios to inform the level of a 24-hour standard that would provide supplemental protection to a generally controlling annual standard?
- f. Staff's conclusion that consideration should be given to retaining the current 24-hour standard level of 35  $\mu\text{g}/\text{m}^3$  in conjunction with annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$ , and that consideration could also be given to an alternative 24-hour standard level of 30  $\mu\text{g}/\text{m}^3$  particularly in conjunction with an annual standard level of 11  $\mu\text{g}/\text{m}^3$ ?

##### **4. Key Uncertainties and Areas for Future Research and Data Collection (section 2.5):**

What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?

### Chapter 3 (Primary Standard for Coarse Particles)

- 5. Current Approach (sections 3.1.4, 3.2, 3.3):**
  - a. What are the Panel's views on the approach to translating the available evidence and air quality information into the basis for reviewing the coarse particle standard?
  - b. Has staff appropriately applied this approach in reviewing the adequacy of the current standard (section 3.2) and potential alternative standards (section 3.3)?
- 6. Adequacy of the Current PM<sub>10</sub> Standard (section 3.2):** What are the Panel's views on the alternative approaches presented for considering the evidence and its uncertainties as they relate to the adequacy of the current standard?
- 7. Indicator (section 3.3.1):** What are the Panel's views on the approach taken to considering standard indicator and on staff's conclusion that PM<sub>10</sub> remains an appropriate indicator in this review?
- 8. Form (section 3.3.3):** What are the Panel's views on the approach taken to considering the form of the standard and on staff's conclusion that revising the form to a 98<sup>th</sup> percentile form would be appropriate for a 24-hour PM<sub>10</sub> standard meant to protect against exposures to thoracic coarse particles?
- 9. Level (section 3.3.4):** What are the Panel's views on the following:
  - a. The approach taken by staff to identify potential alternative PM<sub>10</sub> standard levels, in conjunction with a 98<sup>th</sup> percentile form, including the weight placed on different studies?
  - b. Staff's conclusion that the evidence most strongly supports standard levels around 85 µg/m<sup>3</sup>?
  - c. The alternative approach to considering the evidence that could support standard levels as low as 65 µg/m<sup>3</sup>?
- 10. Key Uncertainties and Areas for Future Research and Data Collection (section 3.5):**

What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?

### Chapter 4 (Secondary Standard for PM-related Visibility)

- 11. Current Approach (section 4.1.3):**
  - a. What are the Panel's views regarding our approach for translating technical evidence and assessment results into the basis for assessing current fine particle standards and considering alternative standards to provide protection against PM-related visibility impairment?
  - b. Has staff appropriately applied this approach in reviewing the adequacy of the current standard (section 4.2) and potential alternative standards (section 4.3)?
- 12. Nature of the Indicator (section 4.3. 1):** What are the Panel's views on the following:
  - a. Staff's consideration of the three indicators identified in this section and our conclusions on the appropriateness of these indicators for consideration in this review?
  - b. The development and evaluation of a new approach that is based on using speciated PM<sub>2.5</sub> mass and relative humidity to calculate PM<sub>2.5</sub> light extinction by means of the IMPROVE algorithm?
  - c. The assessment approach and results comparing the PM components that contribute to the hours selected in the top percentiles for PM<sub>2.5</sub> mass and PM<sub>10</sub> light extinction?

**13. Alternative Levels and Forms (section 4.3.3):** What are Panel views on the following:

- a. The performance assessment which focused on the Candidate Protection Levels of 64, 112, 191  $\text{Mm}^{-1}$  for  $\text{PM}_{2.5}$  light extinction and speciated  $\text{PM}_{2.5}$  mass-calculated light extinction, and alternative levels of 10, 20, and 30  $\mu\text{g}/\text{m}^3$  for  $\text{PM}_{2.5}$  mass concentration?
- b. Use of three-year averaged 90<sup>th</sup> and 95<sup>th</sup> percentiles in conjunction with a 1-hour daily maximum form and use of three-year averaged 98<sup>th</sup> percentile in conjunction with the all daylight hours form?
- c. Insights to be drawn by comparing the PM components for hours included among the 10% highest for a 1-hour daily maximum form with the hours included among the 2% highest for an all daylight hours form, for the various indicators considered (Appendix C)?

**14. Key Uncertainties and Areas for Future Research and Data Collection (section 4.5):**

What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?