



June 16, 2008

MEMORANDUM

SUBJECT: CASAC Review of Integrated Science Assessment for Sulfur Oxides – Health Criteria: Second External Review Draft

FROM: Ila Cote, Ph.D, Acting Director
National Center for Environmental Assessment –
Research Triangle Park Division (B243-01)

TO: Holly Stallworth, Designated Federal Officer
Clean Air Scientific Advisory Committee
EPA Science Advisory Board Staff Office (1400F)

Attached is the draft *Integrated Science Assessment for Sulfur Oxides – Health Criteria: Second External Review Draft* (draft ISA) prepared by the Environmental Protection Agency's (EPA) National Center for Environmental Assessment – Research Triangle Park Division (NCEA–RTP) as part of EPA's ongoing review of the national ambient air quality standards (NAAQS) for sulfur oxides (SO_x). The purpose of the draft ISA is to identify, evaluate, and summarize scientific information on the health effects associated with gaseous sulfur oxides. The ISA is intended to “accurately reflect the latest scientific knowledge useful in indicating the kind and extent of identifiable effects on public health which may be expected from the presence of [a] pollutant in ambient air” (Clean Air Act, Section 108 (42 U.S.C. 7408)). The draft ISA will be reviewed by the Clean Air Scientific Advisory Committee (CASAC) Sulfur Oxides Primary NAAQS Panel at a public meeting to be held in Research Triangle Park in July 2008. I am requesting that you forward the draft ISA to the CASAC Panel to prepare for that review.

The draft ISA is supported by a series of Annexes that provide more comprehensive and detailed information on the relevant evidence available from the disciplines of atmospheric science, human exposure, toxicology, clinical studies and epidemiology. These Annexes are provided with the ISA for the Panel's information. The CASAC Panel is being asked to review the draft ISA. NCEA-RTP will also address comments received on supporting material in the Annexes, to the extent that Panel members wish to review and provide comments on the Annexes.

Following the review of this second draft ISA, NCEA-RTP staff will prepare a final ISA that addresses comments received from CASAC and the public; the court-ordered deadline for the final ISA is September 12, 2008.

Charge to the CASAC Sulfur Oxides Primary NAAQS Review Panel

We ask the Panel to focus on the following questions in their review:

1. The framework for causal determination and judging the overall weight of evidence, is presented in Chapter 1. Is this the appropriate approach? Is it appropriately applied in the case of SO_x? How could the framework or its application be refined?
2. The discussion of the atmospheric chemistry of SO_x has been expanded to provide a better characterization of the spatial heterogeneity of urban SO₂ concentrations and correlations of SO₂ with other pollutants. We also included new sections describing the regulatory network and siting criteria with maps of SO₂ and other monitors. A brief section describing the available 5-minute SO₂ data was also included. In addition, the relationships between outdoor, indoor, and personal exposure to SO₂ were clarified with additional details on sources of exposure error. Have these revisions to Chapter 2 improved its assessment of the currently available scientific knowledge on atmospheric sciences and exposure and its relevance to the evaluation of human health effects presented in later chapters?
3. In the revision, we reduced redundancy, added summary sections and reorganized Chapter 3. In addition, discussions on potential confounding by and interactions with copollutants have been added. The 2nd draft ISA also includes additional analyses of individual-level data from human clinical studies (Sections 3.1.3. and 4.1.1) that builds upon the analysis included in the 1994 Supplement to the Second Addendum. The toxicology sections were reorganized to focus on studies using more relevant concentrations of SO₂ and sections were added to better discuss mode of action and potential particle-SO₂ interactions. We are requesting CASAC review specifically on these analyses as well as on the integration of the overall evidence from the human clinical, animal toxicological, and epidemiological studies.
4. The section on concentration-response relationships in Chapter 4 was reorganized and revised to include analysis of individual-level data from the human clinical studies and some additional discussion of the difficulties of discerning a threshold in population-level data. In addition, revisions were made to better characterize groups likely to be susceptible or vulnerable to SO_x and the potential size of the population at risk for SO_x-related health effects. Finally, revisions were made to reduce redundancy with material presented in Chapter 3. Have the revisions made to Chapter 4 improved the characterization of the potential public health impact of SO_x exposure?
5. Revisions were made to better integrate findings from atmospheric sciences, ambient air data analyses, exposure assessment, dosimetry, and health evidence in Chapter 5. To what extent do these findings support conclusions regarding causality of SO_x-related health effects at relevant exposures?

We look forward to discussing these issues with the CASAC SO_x Primary Panel at our upcoming meeting. Should you have any questions regarding the draft ISA, please feel free to contact me (919-541-4173, email cote.ila@epa.gov), or Dr. Jee Young Kim (919-541-4157; email kim.jee-young@epa.gov).

Attachments

cc: Vanessa Vu, SAB, OA
Peter Preuss, ORD/NCEA
John Vandenberg, ORD/NCEA
Ila Cote, ORD/NCEA
Mary Ross, ORD/NCEA
Jee Young Kim, ORD/NCEA
Doug Johns, ORD/NCEA
Joseph Pinto, ORD/NCEA
Karen Martin, OAR/OAQPS
Lydia Wegman, OAR/OAQPS