



THE ADMINISTRATOR OF THE ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OCT 17 2016

Ana V. Diez Roux, M.D., Ph.D.  
Chairwoman  
Clean Air Scientific Advisory Committee  
Science Advisory Board  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, NW  
Washington, D.C. 20460

Dear Dr. Diez Roux:

I want to thank you and the members of the Clean Air Scientific Advisory Committee's Oxides of Nitrogen and Oxides of Sulfur Secondary National Ambient Air Quality Standards Review Panel for your comments on the U.S. Environmental Protection Agency's "Integrated Review Plan for the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Sulfur, External Review Draft." My colleagues and I appreciate your review and the detailed information and advice provided during the public teleconferences on December 1, 2015, and February 29, 2016, and in your April 1, 2016, letter.

As the EPA works to finalize the integrated review plan for the secondary National Ambient Air Quality Standards for oxides of nitrogen and sulfur, we will thoughtfully consider the panel's comments and recommendations as well as those submitted by the public. When we finalize the integrated review plan, we will transmit the final document to the Science Advisory Board's staff office, along with a memorandum highlighting the revisions made in response to the advisory committee's comments.

The EPA also looks forward to continuing to interact with the panel as the agency develops the integrated science assessment and other documents to support the secondary National Ambient Air Quality Standards for oxides of nitrogen and sulfur.

In the meantime, please accept my appreciation for your hard work and your expertise.

Sincerely,

A handwritten signature in black ink, appearing to read "Gina McCarthy".

Gina McCarthy



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OCT 17 2016

Ivan J. Fernandez, Ph.D.  
Chairman  
Clean Air Scientific Advisory Committee Augmented  
for Oxides of Nitrogen and Oxides of Sulfur  
Secondary National Ambient Air Quality Standards  
Science Advisory Board  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, NW  
Washington, D.C. 20460

Dear Dr. Fernandez:

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Gina McCarthy



January 18, 2017

**MEMORANDUM**

**SUBJECT:** Release of the Final *Integrated Review Plan for the Secondary National Ambient Air Quality Standards for Ecological Effects of Oxides of Nitrogen, Oxides of Sulfur and Particulate Matter*

**FROM:** Erika Sasser, Director /s/  
Health and Environmental Impacts Division  
Office of Air Quality Planning and Standards

**TO:** Thomas Armitage  
Designated Federal Officer  
Clean Air Scientific Advisory Committee  
EPA Science Advisory Board Staff Office

As part of the ongoing review of the secondary national ambient air quality standards (NAAQS) for oxides of nitrogen and sulfur, staff in the EPA's Office of Air Quality Planning and Standards and National Center for Environmental Assessment have prepared the final document, *Integrated Review Plan for the National Ambient Air Quality Standards for Ecological Effects of Oxides of Nitrogen, Oxides of Sulfur and Particulate Matter* (IRP). The IRP is being made available on the EPA's website at <https://www.epa.gov/naaqs/nitrogen-dioxide-no2-and-sulfur-dioxide-so2-secondary-standards-planning-documents-current>.

The planning phase for the current review of the secondary NAAQS for oxides of nitrogen and sulfur began in 2014, with a science policy workshop held in Research Triangle Park, NC. Drawing from the workshop discussions, a draft IRP presented the anticipated schedule for this review of the secondary NAAQS for oxides of nitrogen and sulfur, the planned approaches to developing key assessment documents, and the policy-relevant science issues anticipated to guide the review. The draft IRP was reviewed by the Clean Air Scientific Advisory Committee (CASAC) Secondary NAAQS Review Panel for Oxides of Nitrogen and Sulfur Panel at teleconference meetings on December 1, 2015 and February 29, 2016. The CASAC's advice on the draft IRP was provided in a letter to the EPA Administrator dated April 1, 2016.

The final IRP being released today incorporates a number of changes from the draft IRP, reflecting the CASAC's advice and the public input received. We appreciate the Panel's review, which contributed to improvements in the IRP and to the broadened scope of the review reflected in the final document. Some of the most significant changes made for the IRP are summarized below.

- 1) We have modified and clarified the scope of this review to ensure full consideration of the welfare effects related to atmospheric deposition of oxides of nitrogen and oxides of sulfur and their transformation products. In addition to evaluating the ecological effects of oxides of nitrogen and sulfur, this review will include consideration of particulate matter (PM) ecological effects, recognizing the contribution of PM through deposition to eutrophication-, acidification-, and S enrichment-related welfare effects, as well as to direct and indirect effects on vegetation, soils, and biota. This approach addresses the CASAC's comments expressing concern that PM-deposition-related effects were not adequately covered and the CASAC's comment that EPA should consider all reduced nitrogen compounds, including ammonia and ammonium, to properly evaluate ecological impacts from nitrogen deposition in the secondary standards review for oxides of nitrogen and oxides of sulfur.
- 2) We have further clarified the scope of this review in regard to consideration of other non-ecological welfare effects, such as visibility impairment, climate effects and materials damage. Specifically, these other welfare effects associated with PM, including particulate transformation products of oxides of nitrogen and oxides of sulfur, are considered as part of the ongoing review of the NAAQS for PM. This approach is consistent with the consideration of such effects in the 2012 PM review and recognizes the significant contribution of PM to these effects, while also acknowledging the challenges of distinguishing between the impacts of gaseous and particulate nitrogen and sulfur wet deposition (i.e. in the case of materials damage).
- 3) We have significantly expanded the discussion of the NAAQS process to clarify the roles of each document that will be produced for the review and have highlighted the immediate next steps in the process, namely the draft Integrated Science Assessment (ISA) and Risk and Exposure Assessment (REA) Planning Document.
- 4) We have expanded the discussion of the previous review to include more details on the work and outcomes of the 2012 review and the advice received from the CASAC review panel during the course of that review. For example, a more detailed discussion of the development of the AAI and the limitations and uncertainties from that review is now included.
- 5) We have improved the description of the various components of air quality standards such as indicator, form, level, and averaging time. In addition, we have added further clarification of the approach and the policy-relevant questions in Chapter 2 to recognize the likelihood of multiple exposure metrics being used to relate the broad and diverse set of endpoints pertinent in this review and their associated ecosystem impacts to ambient air concentrations of oxides of nitrogen, oxides of sulfur and PM. Use of such analyses is consistent with such use in other NAAQS reviews where EPA has evaluated the protection afforded by standards using a variety of exposure metrics. Chapter 2 includes examples of similar approaches from previous NAAQS reviews.
- 6) We have improved the scope, clarity and organization of Chapter 4, with the goal of more clearly articulating the plan for considering and developing any risk and exposure assessments for this review. More specifically, we have further summarized the analytical approaches included in the 2009 REA and the uncertainties associated with those

analyses, reduced inconsistencies in the discussion of the process for considering potential data, tools and methods for any risk and exposure assessments in the REA Planning Document, and highlighted several new sources of information and resources that may be useful in conducting quantitative analyses in this review. Further discussion of currently available models and tools, along with their potential application in this review, will be included in the REA Planning Document for this review.

Our current schedule calls for the release of a first draft ISA in early 2017. We anticipate that this document will be reviewed by the Panel in May 2017. We look forward to further discussions with the Panel as this review progresses. Should you have any questions regarding the final IRP or the review in general, please contact Ginger Tennant (919-541-4072; [tennant.ginger@epa.gov](mailto:tennant.ginger@epa.gov)).

cc: Karen Wesson, OAQPS/HEID  
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