



April 22, 2011

**MEMORANDUM**

**SUBJECT:** CASAC Review of *Ozone National Ambient Air Quality Standards: Scope and Methods Plan for Health Risk and Exposure Assessment* and *Ozone National Ambient Air Quality Standards: Scope and Methods Plan for Welfare Risk and Exposure Assessment*

**FROM:** Lydia N. Wegman, Director /s/  
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Office of Air Quality Planning and Standards  
United States Environmental Protection Agency

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

Attached are the *Ozone National Ambient Air Quality Standards: Scope and Methods Plan for Health Risk and Exposure Assessment* and *Ozone National Ambient Air Quality Standards: Scope and Methods Plan for Welfare Risk and Exposure 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 primary (health-based) and secondary (welfare-based) national ambient air quality standards (NAAQS) for ozone. These documents will be the focus of a review by the Clean Air Scientific Advisory Committee (CASAC) Ozone Review Panel at a public meeting to be held in Chapel Hill, NC on May 19-20, 2011. I am requesting that you forward these documents to the CASAC Ozone Review Panel to prepare for the May meeting. EPA is also releasing the final *Integrated Review Plan for the Ozone National Ambient Air Quality Standards*, which is attached for your reference.

As part of the reviews of the primary and secondary NAAQS for ozone, EPA's OAQPS staff has prepared scope and methods plans. These plans describe the analyses that EPA plans to complete in support of the reviews. These analyses include quantitative and qualitative assessments of exposure and risks associated with current NAAQS as well as alternative primary and secondary NAAQS. The scope and methods plans are informed by the key scientific information contained in the document *Ozone and Related Photochemical Oxidants - First External Review Draft*, prepared by EPA's National Center for Environmental Assessment

(NCEA). These documents, along with EPA's Integrated Review Plan, can be found at [http://www.epa.gov/ttn/naaqs/standards/ozone/s\\_o3\\_index.html](http://www.epa.gov/ttn/naaqs/standards/ozone/s_o3_index.html).

The CASAC and public comments on the scope and methods plans will be taken into consideration as EPA prepares the first draft risk and exposure assessments which EPA expects to release for public and CASAC comment and review in October 2011. Second draft risk and exposure assessments will be released in May 2012. Following completion of the final risk and exposure assessments, EPA will release first and second drafts of a policy assessment in June 2012 and November 2012, respectively. A final policy assessment will be released in March 2013. Following completion of the final policy assessment, EPA will conduct a rulemaking with regard to its review of the primary and secondary ozone NAAQS, with an expected proposed rule to be issued in September 2013, and a final rule in June 2014. Documents are being made available to the CASAC Ozone Review Panel in the form of attached electronic files. The documents are also available from the EPA website at [http://www.epa.gov/ttn/naaqs/standards/ozone/s\\_o3\\_index.html](http://www.epa.gov/ttn/naaqs/standards/ozone/s_o3_index.html). Printed copies of these documents will be sent to CASAC Ozone Review Panel members via Federal Express. Sets of charge questions related to each of the scope and methods plans are attached.

We look forward to discussing the scope and methods plans with the CASAC Ozone Review Panel at our upcoming meeting. Should you have any questions regarding the scope and methods plans, please contact me (919-541-5505; email [wegman.lydia@epa.gov](mailto:wegman.lydia@epa.gov)), Mr. John Langstaff (919-541-1449; email [langstaff.john@epa.gov](mailto:langstaff.john@epa.gov)) for questions regarding the health risk assessment, or Dr. Travis Smith (919-541-2035; email [smith.jtravis@epa.gov](mailto:smith.jtravis@epa.gov)) for questions regarding the welfare risk assessment.

#### Attachments

cc: Vanessa Vu, SAB, OA  
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**Areas on which EPA would request the Ozone Review Panel focus their consultation on the Ozone National Ambient Air Quality Standards: Scope and Methods Plan for Health Risk and Exposure Assessment**

**Exposure Analysis:**

1. The overall approach to be used for the exposure analysis, including the use of the APEX model, given the objectives of the analyses, which include development of exposure inputs to the risk assessment, assessment of population exposures exceeding health benchmarks, and analysis of characteristics of characteristics of populations in the upper percentiles of exposure distributions.
2. The population groups of interest (all school-age children, asthmatic children, elderly people, outdoor workers, and the general population) for which ozone exposure estimates are to be developed.
3. The approach for quantitatively addressing uncertainty and variability in the exposure analysis.

**Health Risk Assessment:**

1. The general structure and overall approach that staff plans to use for the risk assessment, considering the different parts of the assessment based on controlled human exposure studies and on epidemiologic and/or field studies.
2. In considering the part of the risk assessment to be based on controlled human exposure studies:
  - a. The criteria that staff plans to use for the selection of health endpoints and exposure-response functions.
  - b. Focusing on lung function decrements in the quantitative risk assessment.
  - c. The methodology and specific studies that staff plans to use to estimate probabilistic exposure-response relationships for lung function decrements.
3. In considering the part of the risk assessment to be based on epidemiologic and/or field studies:
  - a. The criteria that staff plans to use for the selection of health endpoints, urban areas, studies, and concentration-response functions.
  - b. In particular, (i) the decision to only use quadratic rollback in simulating attainment of both the current and alternative standard levels considered in the risk assessment, (ii) the approach of favoring distributed lags in specifying concentration-response functions for short-term exposure-related endpoints, and (iii) the decision not to consider thresholds, even as part of the sensitivity analysis (both for short-term and long-term exposure-related health endpoints).
  - c. The use of the environmental Benefits Mapping and Analysis Program (BenMAP) to perform the quantitative risk assessment.
  - d. The approach towards addressing long-term exposure-related health effects, including potential modeling of both respiratory-related mortality and morbidity endpoints.
4. The approach to addressing uncertainty and variability in each part of the risk assessment.

**Areas on which EPA would request the Ozone Review Panel focus their consultation on the *Ozone National Ambient Air Quality Standards: Scope and Methods Plan for Welfare Risk and Exposure Assessment***

**Overview of Planned Assessment**

1. The overall approach to be used for the Risk and Exposure Assessment and their relevance to the stated goals of the REA.

**Air Quality Considerations**

2. Staff's proposed methods to characterize O<sub>3</sub> exposure in non-monitored areas, specifically the proposed approaches to create a national ozone surface using either monitor-adjusted model data from the Community Multiscale Air Quality (CMAQ) model or interpolating monitor data using a voronoi neighborhood averaging (VNA) technique.

**Ecological Effects of Exposure**

3. Staff's planned use of National Health and Environmental Effects Research Laboratory-Western Ecology Division (NHEERL WED) OTC C-R functions to characterize the risk of tree seedling biomass loss from O<sub>3</sub>-related exposures in the U.S.
4. Staff's proposed use of the visible foliar injury data within the large bio-monitoring database maintained by the USDA Forest Service Forest Inventory and Analysis (FIA) to evaluate the degree of co-occurrence of visible foliar injury and areas of high estimated O<sub>3</sub> exposure as indicated by the NOES.
5. Staff's criteria for selection of urban and National Park Service case study areas and the appropriateness of the case study areas staff suggested in section 3.2.
6. The ecological metrics proposed by staff that may be calculated in case study areas.

**Ecosystem Services Assessment**

7. The proposed Ecosystems Services Risk overview illustrated in Figure 4.1.
8. Staff's planned use of concentration-response (C R) functions from the National Crop Loss Assessment Network (NCLAN) to estimate crop yield losses related to O<sub>3</sub> exposures in the U.S.
9. The overall approach for updating the benefits analysis for crops, including using the Agricultural Simulation Model (AGSIM©).
10. The appropriateness of using the Forest and Agricultural Sector Optimization Model (FASOM), the linked tree growth (TREGRO) or the stand growth (ZELIG) model system to assess the impacts of O<sub>3</sub> air quality on forest growth.
11. The potential Ecosystem Services that Staff has proposed for analysis in the case study areas. Staff is aware that some of these will be limited by data availability, but have included as complete a list as possible to at least assess qualitatively.
12. Staff's proposed use of the i-TREE model to assess ecosystem services in urban areas.