UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF
AIR AND RADIATION

MEMORANDUM

SUBJECT: Request for SAB review of the Section 812 Air Toxics Case Study: Health Benefits of Benzene Reductions in Houston, 1990-2020

FROM: for Robert D. Brenner, Director
Office of Policy Analysis and Review (6103A)
Office of Air and Radiation

TO: Holly Stallworth, Ph.D.
EPA Science Advisory Board Staff Office (1400F)

This memorandum is to request a review by the Science Advisory Board's Advisory Council on Clean Air Compliance ("the Council") of the draft document entitled "Section 812 Prospective Study of the Benefits and Costs of the Clean Air Act: Air Toxics Case Study – Health Benefits of Benzene Reductions in Houston, 1990-2020" (March 14, 2008). This document is a case study that will accompany the broader Section 812 Report and presents a methodology for assessing the benefits of reducing benzene levels in the Houston, Texas, area for over 30 years. In addition, this case study will be presented at a joint EPA-SAB workshop on air toxics benefits that is being planned for fall 2008. The document is available for public comment on the Agency's website at http://www.epa.gov/air/sect812/prospective2.html#mar08.

Attached are the "*Charge Questions for Air Toxics Case Study: Health Benefits of Benzene Reductions in Houston, 1990-2020, Section 812 Prospective Study of the Benefits and Costs of the Clean Air Act*" for the Council's peer review.

Attachment

ADVISORY COUNCIL ON CLEAN AIR COMPLIANCE ANALYSIS

Charge Questions for Air Toxics Case Study: Health Benefits of Benzene Reductions in Houston, 1990-2020 Section 812 Prospective Study of the Benefits and Costs of the Clean Air Act

EPA requests that the Council review the draft benzene case study ("case study") and respectfully submits the following questions. For both the general and specific questions, please specify any alternative approaches or issues that the Council recommends EPA consider.

1. General Review. Please comment on the validity, reliability and utility of this case study and whether it achieved its purpose in contributing to the science of estimating the benefits of reduced concentrations of air toxics. Specifically, please comment on:
   - EPA's data choices and characterization of results given these data choices;
   - EPA's methodological choices made for analyzing the data; and
   - Implications this case study may have for future analyses (see EPA's views in Section 4.3).

2. Emissions Estimations. EPA developed a benzene emissions inventory for the three counties in the case study, based on EPA's National Emissions Inventory (NEI), MOBILE6.2 model, and NONROAD 2004 model. Please comment on this approach to emissions estimation.

3. Air Quality Modeling and Exposure Modeling. EPA used the American Meteorological Society/US EPA Regulatory Model (AERMOD) to estimate changes in ambient concentrations and the Hazardous Air Pollutant Exposure Model (HAPEM6) to estimate individual exposures to benzene levels. Please comment on this approach.

4. Life table approach for health benefits. Please comment on EPA's life table approach for estimating health benefits, specifically addressing the following:
   - EPA's selection of leukemia as the primary health endpoint;
   - EPA's use of weighted, cumulative exposure measures in the life table risk model to account for the cessation lag in the realization of benefits following benzene exposure reductions;
   - EPA's interpretation of the literature on latency and cessation lag for benzene-induced leukemia;
   - EPA's choice of a linear dose-response function;
   - EPA's sensitivity analyses of the primary benefits estimate (i.e., choice of epidemiological cohort study, the health endpoints of all leukemia versus acute myelogenous leukemia, the lag length, and the exposure values used); and
   - EPA's choice not to apply an adjustment for exposure to benzene in early life.

5. Valuation. Please comment on EPA's approach to assigning economic value to avoided cases of leukemia, both fatal and non-fatal, with specific reference to:
    - EPA's use of a "pre-mortality morbidity" supplement to VSL for fatal leukemias;
    - EPA's development of a unit value for a non-fatal case of leukemia based on current literature and previous SAB advice; and
    - EPA's choice not to include a "cancer premium," consistent with the SAB Environmental Economics Advisory Committee (EEAC) panel in 2001.

6. Analyses of Individuals in High-Exposure Environments. We conducted three supplemental analyses of CAAA-related impacts to Houston residents anticipated to have higher than average benzene exposures due to their location:1) residents living in census tracts with high modeled exposures; 2) residents living near roadways; and 3) residents living in homes with attached garages.

    Please comment on the data and methodological choices for these analyses with specific reference to:
    - EPA's choices regarding the most useful high exposure scenarios to evaluate; and
    - EPA's overall approach to valuing risk reductions using VSL, which does not account specifically for individuals who may have a higher than average baseline mortality risk due to high exposures to multiple HAPs and (as stated above in the question on a possible cancer premium) does not apply adjustments to account for the characteristics of the HAP risks being reduced.