

STATEMENT OF DR. GEORGE D. THURSTON, Sc. D.  
TO THE  
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS  
OF THE  
UNITED STATES SENATE

SUBCOMMITTEE ON PUBLIC SECTOR SOLUTIONS TO GLOBAL WARMING,  
OVERSIGHT, AND CHILDREN'S HEALTH PROTECTION

RE: SCIENCE AND ENVIRONMENTAL REGULATORY DECISIONS

MAY 7, 2008

I am George D. Thurston, a tenured Professor of Environmental Medicine at the New York University (NYU) School of Medicine. I am a member of the American Thoracic Society, and, in connection with that membership, I also serve on the Healthy Air Committee of the ATS' sister organization, the American Lung Association. I testify today on behalf of the American Lung Association. I would like to submit the attached statement for the record which amplifies on my testimony.

My scientific research involves the investigation of the human health effects of air pollution. Unfortunately, despite progress over the last few decades, Americans are still suffering from the adverse health effects of air pollution. The health consequences of breathing air pollution are severe and well documented in the published medical and scientific literature. Over the past few decades, medical researchers examining air pollution and public health, including myself, have shown that ambient air pollution is associated with a host of serious adverse human health effects, including asthma attacks, heart attacks, hospital admissions, adverse birth outcomes, and premature death.<sup>1 2</sup>

The Clean Air Act Amendments of 1970 first introduced enforceable National Ambient Air Quality Standards (NAAQS) to effectively regulate ozone and other pollutants. The Act provides a clear basis for the U.S. Environmental Protection Agency to establish the NAAQS: the EPA must set the primary, or health-based, NAAQS at a level "requisite to protect the public health" with "an adequate margin of safety."

Unfortunately, the EPA failed to follow the science and establish a NAAQS for ozone that meets that requirement. The EPA Administrator failed to heed the express recommendations of his scientific advisors—the Clean Air Science Advisory Committee—and the solid recommendations of the mainstream medical and public health community.<sup>3</sup> In doing so, he raised arguments that misinterpreted the fundamental soundness of the scientific evidence and CASAC recommendations.

My testimony today will focus on the arguments that the Administrator made for questioning and rejecting the science in this case.

First, I'd like to review the evidence that supports a much more protective standard. Scientific evidence accumulated over the last ten years provides clear evidence that ozone creates adverse health effects at lower levels. Since I testified before this committee in 1996, more than 1,700 peer-reviewed studies examining the health effects of ozone were published. The 23 expert scientists on the CASAC extensively reviewed this new body of evidence in six in-person meetings, in detailed oral comments and seven sets of written comments totaling 500 pages. Their conclusions

were clear: to meet the basic requirements to protect public health, the NAAQS needed to be between .0.060 and 0.070 parts per million.

Following their review, a host of the nation's leading medical societies and public health organizations led by the American Lung Association and the American Thoracic Society called on the EPA to adopt standards in keeping with the CASAC's recommendations. That group included the American Academy of Pediatrics, the American Medical Association, the American Academy of Chest Physicians and the American Public Health Association. In addition, over 100 leading independent air quality scientists and physicians endorsed these recommendations.

Without doubt, the consensus of the scientific community believed the evidence sufficient to require the EPA to adopt a standard within the range of .0.060 to 0.070 ppm. Instead the Administrator selected a much weaker standard, that of 0.075 ppm, arguing that the uncertainty over the research prevented him from following the guidance of the CASAC.

In the face of this strong consensus, it is untenable to cite "uncertainty" as a rationale for failing to promulgate tighter standards. Indeed, the EPA mentions uncertainty no fewer than 100 times in the preamble, despite the massive accumulation of published evidence. There are two basic problems with the Administrations "uncertainty" argument for choosing a standard less stringent than recommended by CASAC.

First, in the face of uncertainty, the Clean Air Act says that the Administrator must choose a more stringent standard, to ensure a margin of safety.<sup>4</sup> If uncertainty is really the reason for deviating from CASAC's advice, then the Administrator should have set an even more stringent standard to provide a margin of safety against that uncertainty.

EPA's uncertainty claims arbitrarily ignore uncertainties that favor more protective standards. For instance, controlled human exposure studies typically use healthy young adults as test subjects. This creates uncertainty about what the results would be on infants, or children, or children with severe respiratory disease, for example, simply because we cannot use them as test subjects.

Secondly, the Administration has apparently confused scientific uncertainty in the size of the pollution effect estimates (i.e., the confidence intervals around those estimates), with scientific doubt about the health effects. While there is uncertainty about the exact size of the health benefits of lowering the ozone standard below .075 ppm, there is *no doubt* that health benefits would be achieved by setting a more stringent ozone standard. Furthermore, due to uncertainty, these benefits may prove greater than those the EPA estimated.

The Administrator similarly deviated from CASAC's advice in setting the recent standards for particulate matter, most notably in not lowering the long-term PM standard below 15 micrograms per meter cubed, and thereby failing to sufficiently protect public health from this pollution.

As a result of the Administrator's intransigence, CASAC has, in recent years, written an unprecedented number of letters objecting to decisions he made that differed significantly from their advice. The following is a quote from their most recent letter comments on the ozone NAAQS decision:<sup>5</sup>

*"...the members of the CASAC Ozone Review Panel do not endorse the new primary ozone standard as being sufficiently protective of public health. The CASAC -- as the Agency's statutorily-established science advisory committee for advising you on the national ambient air quality standards -- unanimously recommended decreasing the primary standard to within the range of 0.060-0.070 ppm. It is the Committee's consensus scientific opinion that your decision to set the primary ozone standard above this range fails to satisfy the explicit stipulations of the Clean Air Act that you ensure an adequate margin of safety for all individuals, including sensitive populations."*

As this letter notes, the EPA Administrator has failed to follow the ample scientific evidence and the expert advice of CASAC, particularly in setting the ozone standards and, as well, the most recent PM<sub>2.5</sub> standard. In doing so, not only has the EPA Administrator dismissed the recommendations of CASAC, he has failed to provide a sufficient scientific justification for these decisions. So what are the impacts? We have the present annual average PM<sub>2.5</sub> standard and the newly adopted 8-hr. average ozone standard, which fail to protect the public from the increased risk of asthma attacks, heart attacks, stroke, lung cancer, and premature death, protections they deserve and to which they are entitled. . Since they fail to protect from ozone at levels demonstrated to cause harm, they certainly fail to provide a margin of safety for the protection of public health, as unequivocally required by the Clean Air Act.

Overall, it is vital that the Administrator give proper deference to CASAC's advice in the air quality standard-setting process, and, thereby, apply sound science to the setting of EPA's air pollution regulations. Only in this manner can the intent of the Clean Air Act be fulfilled, and the health of the public be properly protected.

Thank you for the opportunity to testify on this important issue.

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<sup>1</sup> The list of citations for the health effects of ozone and particulate matter is extensive. The references below are primarily for ozone. Horstman DH, Folinsbee LJ, Ives PJ, Abdul-Salaam S, McDonnell WF. Ozone concentration and pulmonary response relationships for 6.6-hour exposures with five hours of moderate exercise to 0.08, 0.10, and 0.12 ppm. *Am Rev Respir Dis* 1990; 42:1158-1163. McDonnell WF, Stewart PW, Smith MV, Pan WK, Pan J. Ozone-induced respiratory symptoms: exposure-response models and association with lung function. *Eur Respir J* 1999;14:845–853. Triche EW, Gent JF, Holford TR, Belanger K, Bracken MB, Beckett WS, Naeher L, McSharry JE, Leaderer BP. Low-level ozone exposure and respiratory symptoms in infants. *Environ Health Perspect* 2006;114:911–916. Mudway IS and Kelly FJ. An investigation of inhaled ozone dose and the magnitude of airway inflammation in healthy adults. *Am J Respir Crit Care Med* 2004;169:1089-1095. Gent JF, Triche EW, Holford TR, Belanger K., Bracken MB, Beckett WS, Leaderer BP. Association of low-level ozone and fine particles with respiratory symptoms in children with asthma. *JAMA* 2003;290:1859-1867; Desqueyroux H, Pujet J-C, Prosper M, Squinazi F, Momas I. Short-term effects of low-level air pollution on respiratory health of adults suffering from moderate to severe asthma. *Environmental Research* 2002;89:29-37; and Burnett RT, Brook JR, Yung WT, Dales RE, Krewski D. Association between ozone and hospitalization for respiratory diseases in 16 Canadian cities. *Environmental Research* 1997;72:24-31. Tager IB, Balme J, Lurmann F, Ngo L, Alcorn S, Kunzli N. Chronic exposure to ambient ozone and lung function in young adults. *Epidemiology* 2005;16:751–759. Bell ML, Dominici F, Samet JM. A meta-analysis of time-series studies of ozone and mortality with comparison to the National Morbidity, Mortality, and Air Pollution Study. *Epidemiology* 2005;16:436-445; Ito K, DeLeon S F, Lippmann M. Associations between ozone and daily mortality: Analysis and meta-analysis. *Epidemiology* 2005;16:446-457; Levy J I, Chemerynski SM, Sarnat JA. Ozone exposure and mortality: An empiric Bayes metaregression analysis. *Epidemiology* 2005;16:458-468. Horstman DH, Folinsbee LJ, Ives PJ, Abdul-Salaam S, McDonnell WF. Ozone concentration and pulmonary response relationships for 6.6-hour exposures with five hours of moderate exercise to 0.08, 0.10, and 0.12 ppm. *Am Rev Respir Dis* 1990; 42:1158-1163.

<sup>2</sup> A sample of the major studies documenting the health effects of particulate matter include the following: Pope CA III, Burnett RT, Thurston GD, Thun MJ, Calle EE, Krewski D, Godleski JJ. Cardiovascular Mortality and Year-round Exposure to Particulate Air Pollution: epidemiological evidence of general pathophysiological pathways of disease. *Circulation*. 2004;109:71-77. Pope CA, Burnett RT, Thun MJ, Calle EE, Krewski D, Ito K, Thurston GD. Lung Cancer, Cardiopulmonary Mortality, and Long-Term Exposure to Fine Particulate Air Pollution. *JAMA* 2002;1132-1141. Dominici F, Peng RD, Bell ML, Pham L, McDermott A, Zeger SL, Samet JM. Fine Particulate Air Pollution and Hospital Admission for Cardiovascular and Respiratory Diseases. *JAMA* 2006;295:1127-1134. Pope CA III, Dockery DW. Health Effects of Fine Particulate Air Pollution: Lines that Connect. *J Air Waste Manage Assoc* 2006; 56:709-742. Gauderman WJ, Avol E, Gilliland F, Vora H, Thomas D, Berhane K, McConnell R, Kuenzli N, Lurmann F, Rappaport E, Margolis H, Bates D, Peters J. The Effect of Air Pollution on Lung Development from 10 to 18 Years of Age. *NEJM* 2004;351:1057-1067.

<sup>3</sup> 40 U.S.C. § 7409(b)(1)

<sup>4</sup> For example, see *American Lung Assn. v. EPA*, 134 F.3d 388, 389; D.C. Cir. 1998.

<sup>5</sup> Letter from Dr. Rogene Henderson, Chair, Clean Air Scientific Advisory Committee to Stephen L. Johnson, Administrator, U.S. Environmental Protection Agency, re Clean Air Scientific Advisory Committee Recommendations Concerning the Final Rule for the National Ambient Air Quality Standards for Ozone, EPA-CASAC-08-009, April 7, 2008.