APPENDIX II

FINDINGS OF THE SCIENTIFIC REVIEW PANEL

CENTER FOR OCCUPATIONAL AND ENVIRONMENTAL HEALTH

UNIVERSITY OF CALIFORNIA, LOS ANGELES • SCHOOL OF PUBLIC HEALTH
650 CHARLES E. YOUNG DRIVE SOUTH, LOS ANGELES, CALIFORNIA 90095-1772
TELEPHONE 310-206-6920 • FAX 310-206-9903
DIRECTOR: JOHN R. FROINES, PHD.

September 12, 2005

Barbara Riordan
Interim Chairman
Air Resources Board
1001 I street
P.O. Box 2815
Sacramento, California 95812

Dear Mrs. Riordan:

I am pleased to transmit to you the Scientific Review Panel on Toxic Air Contaminants' Findings (enclosed) for the report *Proposed Identification of Environmental Tobacco Smoke as a Toxic Air Contaminant* as adopted by the Panel at its June 24, 2005 meeting.

The Panel reviewed the scientific data on which the report is based, the scientific procedures and methods used to support the data, and the conclusions and assessments on which the report is based, as required by state law. Public comments and responses to those comments were also reviewed. It is the Panel's conclusion that environmental tobacco smoke should be listed as a toxic air contaminant, and that the report, with the revisions requested by the Panel, is based on sound scientific knowledge. The Panel further recommends that, should the Air Resources Board list environmental tobacco smoke as a toxic air contaminant, it also be added by the Office of Environmental Health Hazard Assessment to the list of toxic air contaminants that may disproportionately impact children.

On behalf of the Panel, let me also take this opportunity to thank the staffs of the Air Resources Board and the Office of Environmental Health Hazard Assessment for their prodigious efforts in completing this report. We appreciate that this was an enormous undertaking that took several years. The final report enumerates the serious health consequences of exposure to environmental tobacco smoke, and provides a clear rationale of the urgency and necessity to reduce public exposures wherever possible.

We ask that the Panel's findings and this letter be made a part of the final report.

Sincerely,

John R. Froines, Ph.D.
Chairman
Scientific Review Panel

cc: Scientific Review Panel members

Joan E. Denton, Ph.D., Director
Office of Environmental Health Hazard Assessment

Jim Behrmann
Liaison, Scientific Review Panel

Enclosure

Findings of the Scientific Review Panel on
Proposed Identification of Environmental Tobacco Smoke
as a Toxic Air Contaminant
as adopted at the Panel's June 24, 2005 Meeting

The Scientific Review Panel on Toxic Air Contaminants (Panel) reviewed the report, *Proposed Identification of Environmental Tobacco Smoke as a Toxic Air Contaminant,* prepared by the Office of Environmental Health Hazard Assessment (OEHHA) and the California Air Resources Board (ARB) of the California Environmental Protection Agency (Cal/EPA). This report, a comprehensive update of an earlier report first released in 1997 (Cal/EPA, 1997) and later published by the U.S. National Cancer Institute (NCI, 1999), describes the public's exposure to environmental tobacco smoke (ETS) and its adverse effects on our health. The new research published since the 1997 report confirms and strengthens the conclusions of the original 1997 report and allows several new conclusions to be drawn.

The Children's Environmental Health Protection Act of 1999 amended the toxic air contaminant statute to explicitly require consideration of any evidence on special susceptibilities of infants and children to the effects of candidate toxic air contaminants. The updated report fulfills this requirement.

An initial draft of this updated report was released for public comment on December 17, 2003. A public workshop was held in March 2004 and the comment period was extended to March 29, 2004. A revised report was submitted to the Panel on October 12, 2004 for review as required by state law. The Panel discussed the report during its meetings on November 30, 2004, January 6, 2005, March 14, 2005, and June 24, 2005. Based on these discussions, the Panel's review of the report and information submitted through the public comment process, the Panel makes the following findings pursuant to Health and Safety Code section 39661:

1. Environmental tobacco smoke (ETS) is a significant source of exposure to compounds already identified as toxic air contaminants. Despite increasing restrictions on smoking and increased public awareness of health impacts, ETS exposure continues to be a major public health concern. For example, annual ETS emissions in California are estimated to include approximately 40 tons of nicotine, 365 tons of suspended particles, and 1900 tons of carbon monoxide.

2. To obtain data on current levels of ETS in ambient air where people spend part of their day, the ARB monitored nicotine concentrations at several outdoor smoking areas in California using nicotine, one commonly used surrogate for ETS. Results showed a range of ambient nicotine concentrations from 0.01 – 5 $\mu g/m^3$ Overall, the study found that concentrations of nicotine correspond to the number of smokers in the smoking areas. Other factors such as the size of the smoking area and wind speed had less of an effect.

3. Exposure to ETS varies widely among individuals and depends on their individual circumstances. Thus, Californians who live in nonsmoking homes and have only brief encounters with ETS are likely to be exposed to less than 0.1 ug/m3 (24-hour time-weighted average nicotine air concentrations), while those who live with smokers and are exposed only in their homes may be exposed to 10 – 100 times as much ETS. Exposure to ETS in vehicles may be much higher, and can lead to even higher 24-hour average exposures. Workplaces, casinos, and bars where smoking still occurs can have high ETS concentrations.

4. Children who live with smokers may be exposed to high levels of ETS in their homes, and even higher levels in vehicles. Although ETS exposures of Californian adults have declined substantially in the past decade, the exposures of children who live with smokers have not been reduced nearly as much.

5. The 1997 report concluded that ETS is causally associated with the following adverse developmental outcomes or other childhood adverse health effects: low birthweight, SIDS, acute lower respiratory tract infections, asthma induction and exacerbation, other chronic respiratory symptoms, and middle ear infections. The scientific evidence published since the 1997 report continues to support, and in many cases strengthen, these conclusions (see Table 1).

6. The 1997 report concluded that ETS is causally associated with the following adverse health effects in adults: eye and nasal irritation, lung and nasal sinus cancer, and heart disease. The current document continues to support and in many cases strengthen these conclusions.

7. There has been substantial new research published on ETS and breast cancer since the 1997 report. Human epidemiological studies, supported by the fact that at least 20 of the chemical constituents of ETS are mammary carcinogens, provide evidence consistent with a causal association between ETS exposure and breast cancer in younger primarily premenopausal women.

8. There is little, if any, evidence of an increase in breast cancer risk in older primarily postmenopausal women.

9. Based on evidence published since the 1997 report, the association between ETS exposure and pre-term delivery has been raised from suggestive to conclusive, adding an additional conclusive adverse health effect among children.

10. Based on evidence published since the 1997 report, the association between ETS exposure and asthma induction and exacerbation in adults, has been raised from suggestive to conclusive.

11. Based on evidence published since the 1997 report, the association between ETS exposure and impaired vascular and platelet function has been raised from suggestive to conclusive.

12. The 1997 report concluded that there is suggestive evidence that ETS is causally associated with the following adverse developmental outcomes or other childhood adverse health effects: spontaneous abortion, intrauterine growth retardation, adverse effects on cognition and behavior, exacerbation of cystic fibrosis, decreased pulmonary function, and decreased exercise tolerance. These conclusions are still supported by recent studies. Published information since the 1997 report provides suggestive evidence of a causal association between ETS and an additional health endpoint: allergic sensitization in children.

13. The 1997 report concluded that there is suggestive evidence that ETS is causally associated with the following adverse health effects in adults: chronic respiratory symptoms and cervical cancer. These conclusions are still supported by recent studies. Evidence published since the 1997 report provides additional suggestive evidence of a causal association between ETS and the following additional adult health endpoints: adverse effects on fertility or fecundity, elevated risk of stroke, chronic respiratory symptoms, and nasopharyngeal cancers.

14. The range of risks associated with ETS exposure are presented in the document for: low birth weight; pre-term delivery; episodes of asthma in children; otitis media in children; sudden infant death syndrome; ischemic heart disease deaths; and lung cancer deaths.

15. Because of the convincing evidence of childhood exposure to ETS, which may be higher under certain scenarios, and because of the conclusive evidence of an association with illnesses, which are either exclusively an issue for children or are more common among children, either conclusively or suggestively, the Panel concludes that exposure to ETS “may cause infants and children to be especially susceptible to illness” as defined by the Children’s Environmental Health Protection Act of 1999.

After careful review of the June 2005 draft of the report *Proposed Identification of Environmental Tobacco Smoke as a Toxic Air Contaminant,* and the scientific procedures, data, conclusions, assessments and methods used in its preparation, the Panel finds that the report is based on sound scientific knowledge, methods and practices and represents a complete and balanced assessment of our current scientific understanding. Based on the available evidence, we conclude ETS is a toxic air contaminant.

The Panel recommends that the ARB take the necessary steps to list ETS as a toxic air contaminant. The Panel further recommends to OEHHA that ETS, once listed, be added to the list of toxic air contaminants that may disproportionately impact children (pursuant to Health and Safety Code section 39669.5(c)).

I certify that the above is a true and correct copy of the findings adopted by the Scientific Review Panel on June 24, 2005.

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John R. Froines, Ph.D.
Chairman, Scientific Review Panel

References cited:

Cal/EPA (1997). Health Effects of Exposure to Environmental Tobacco Smoke. Final Report. California Environmental Protection Agency. Office of Environmental Health Hazard Assessment. September 1997.

National Cancer Institute (NCI) (1999). Health Effects of Exposure to Environmental Tobacco Smoke: The Report of the California Environmental Protection Agency. Smoking and Tobacco Control Monograph no.10. Bethesda, MD. U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute, NIH Pub. No.99-4645.

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TABLE 1

HEALTH EFFECTS CAUSALLY ASSOCIATED* WITH EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE

Developmental Effects

Fetal Growth: Low birth weight and decrease in birth weight
Sudden Infant Death Syndrome (SIDS)
Pre-term delivery

Respiratory Effects

Acute lower respiratory tract infections in children
(*e.g.*, bronchitis and pneumonia)
Asthma induction and exacerbation in children
Asthma induction and exacerbation in adults
Chronic respiratory symptoms in children
Eye and nasal irritation in adults
Middle ear infections in children

Carcinogenic Effects

Lung cancer
Nasal sinus cancer
Breast cancer in younger (primarily pre-menopausal) women

Cardiovascular Effects

Heart disease mortality
Acute and chronic coronary heart disease morbidity
Altered vascular properties

* Conclusive evidence that *italicized health outcomes* are causally associated with ETS exposure was added in this 2005 report update. Other outcomes were found to be causally associated in both the 1997 and 2005 reports.