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June 11, 1991

Mr. William C. Lockett, Chief
Office of External Affairs
California Air Resources Board
1102 Q Street
Sacramento, California 95814

Dear Bill:

The Scientific Review Panel on Toxic Air Contaminants has reviewed the Report on Perchloroethylene and has formulated its findings regarding the report. I am formally submitting the Scientific Review Panel's findings to the Air Resources Board.

Sincerely,

Dr. James N. Pitts, Jr.
Chair, Scientific Review Panel

Enclosure

cc: Scientific Review Panel

Scientific Review Panel Findings on the Perchloroethylene Report

As Adopted at the Panel's June 10, 1991 Meeting

In accordance with California Health and Safety Code section 39661, the Scientific Review Panel (SRP) reviewed the report ("Proposed Identification of Perchloroethylene as a Toxic Air Contaminant") prepared by the staffs of the Air Resources Board (ARB) and the Department of Health Services (DHS) on the public exposure to, and health effects of perchloroethylene. The Panel also reviewed the public comments received on this report. Based on this review, the SRP finds that the report on perchloroethylene is without serious deficiencies and agrees with the staffs of the ARB and the DHS that:

1. There is evidence that exposure to perchloroethylene results in animal carcinogenicity and possible human carcinogenicity. The International Agency for Research on Cancer (IARC) lists perchloroethylene in Group 2B of its classification scheme for carcinogens (possible carcinogen, sufficient evidence from animal studies but inadequate or nonexistent evidence in humans). Staff of the United States Environmental Protection Agency (EPA) recommended perchloroethylene be assigned to Group B2 of its classification scheme for carcinogens (probable carcinogen, sufficient evidence from animal studies but inadequate evidence or no data from epidemiological studies). However, the classification has undergone considerable debate and the 1985 classification as Group C (possible carcinogen, limited carcinogen in animals, absence of human data) continues to be the official designation. Based on available scientific data, the Panel concurs with DHS, EPA, and IARC that perchloroethylene is carcinogenic for animals and possibly carcinogenic for humans.

2. Based on available scientific information, the DHS staff found no evidence of a perchloroethylene exposure level below which no carcinogenic effects are anticipated.

3. Perchloroethylene is listed as a hazardous air pollutant under section 112 of the United States Clean Air Act of 1990.

4. Based on the interpretation of available scientific evidence, the DHS staff estimate that the upper 95 percent confidence limits on the lifetime risk of cancer from perchloroethylene range from 2 to 72 x 10^{-6}ppbv^{-1} [0.3 to 10.6 x 10^{-6}(ug/m^3)$^{-1}$]. The DHS staff identified the best value of perchloroethylene cancer unit risk as 54 x 10^{-6}ppbv^{-1} [8 x 10^{-6}(ug/m^3)$^{-1}$]. Table I compares the best value of upper-bound perchloroethylene cancer unit risk with those of other compounds reviewed by the SRP (the dates these compound's identification reports were approved by the SRP are included in Table 1). Upper-bound excess lifetime risks are health-protective estimates; the actual risk may be significantly lower.

TABLE I

Compound	Unit Risk ($ppbv^{-1}$)	Unit Risk $(ug/m^3)^{-1}$	Date SRP Approved
Inorganic arsenic	particulate	3.3×10^{-3}	4/16/90
Nickel	particulate	2.6×10^{-4}	5/15/91
Vinyl chloride	20×10^{-5}	7.8×10^{-5}	10/19/90
Perchloroethylene	**54×10^{-6}**	**8×10^{-6}**	**6/10/91**
Chloroform	2.6×10^{-5}	5.3×10^{-6}	8/14/90
trichloroethylene	1.1×10^{-5}	2×10^{-6}	4/16/90
Methylene Chloride	3.5×10^{-6}	1×10^{-6}	4/18/89

5. The major identified sources of perchloroethylene emissions to California's outdoor air are dry cleaning and degreasing activities which use perchloroethylene as a solvent.

6. Based on its gas-phase reactivity with hydroxyl radicals, perchloroethylene's estimated half-life is approximately 100 days.

7. Based on data collected by the ARB's ambient toxic air contaminant monitoring network, the estimated mean annual population-weighted exposure for approximately 20 million Californians is 0.37 ppbv.

8. The ARB staff estimated exposure to near-source emissions based on modeling eight perchloroethylene-emitting facilities in the South Coast Air Basin. Five facilities are located in or near the City of Industry and three facilities are located in or near Burbank. Results showed individuals could be exposed to levels significantly above background. In light of this hot spots information, ARB should further extend its modeling and data collection activities throughout the state.

9. Using the DHS staff's best value of cancer unit risk ($54 \times 10^{-6} ppbv^{-1}$, see number 4 above) and the ARB staff's population-weighted exposure (0.37 ppbv, see number 7 above) up to 600 potential excess cancers are predicted for California's population of 30 million due to ambient perchloroethylene exposure. This estimate represents the upper range of plausible excess cancer risk and cancer cases; the actual risk and number of cancer cases may be significantly lower.

10. The DHS staff does not expect noncarcinogenic adverse health effects to occur from average ambient or indoor air perchloroethylene exposure in California. However, there is insufficient data to comment on whether or not noncarcinogenic adverse health effects could result from near-source or "hot spot" exposures.

11. Results from both indoor and personal monitoring in California homes indicate that people are exposed frequently to higher indoor than outdoor perchloroethylene concentrations. However, the level of exposure can vary among the homes because different numbers and types of emission sources may be present in individual homes.

12. Based on available scientific evidence indicating that perchloroethylene is an animal and a possible human carcinogen, we conclude that perchloroethylene should be considered a toxic air contaminant.

We agree with the ARB staff recommendation to its Board that perchloroethylene be listed as a toxic air contaminant.

I certify that the above is a true and correct copy of the findings adopted by the Scientific Review Panel on June 10, 1991.

Dr. James N. Pitts, Jr.
Chairman, SRP