

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Notice of Public Hearing to Consider the Adoption of a Regulatory
Amendment Identifying Perchloroethylene as a Toxic Air Contaminant

Agenda Item No.: 91-8-1

Public Hearing Date: October 10, 1991

Issuing Authority: Air Resources Board

Comment: No comments were received identifying any significant
environmental issues pertaining to this item. The staff report
identified no adverse environmental effects.

Response: N/A

Certified: Pat Hutchens
Pat Hutchens
Board Secretary

Date: 1/23/92

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RESOURCES AGENCY OF CALIFORNIA

State of California
AIR RESOURCES BOARD

Resolution 91-43

October 10, 1991

Agenda Item No.: 91-8-1

WHEREAS, sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to do such acts and to adopt such regulations as may be necessary for the proper execution of the powers and duties granted to, and imposed upon, the Board by law;

WHEREAS, Chapter 3.5 (commencing with section 39650) of Part 2 of Division 26 of the Health and Safety Code establishes procedures for the identification of toxic air contaminants by the Board;

WHEREAS, section 39655 of the Health and Safety Code defines a "toxic air contaminant" as an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health;

WHEREAS, section 39662 of the Health and Safety Code directs the Board to list, by regulation, substances determined to be toxic air contaminants, and to specify for each substance listed a threshold exposure level, if any, below which no significant adverse health effects are anticipated;

WHEREAS, in California, perchloroethylene is emitted during dry cleaning, degreasing, and the manufacture and application of paints, coatings, and adhesives as well as in the course of its distribution, reclamation and disposal;

WHEREAS, perchloroethylene is not naturally removed or detoxified in the atmosphere at a rate that would significantly reduce the resulting public exposure;

WHEREAS, pursuant to the request of the Board, the Office of Environmental Health Hazard Assessment (OEHHA) evaluated the health effects of perchloroethylene in accordance with section 39660 of the Health and Safety Code;

WHEREAS, the OEHHA concluded in its evaluation that perchloroethylene is potentially casually associated with cancer in humans; that health effects other than cancer are not expected to occur at existing average ambient levels of perchloroethylene; that based on the upper 95 percent confidence limit of potency, the estimated range of lifetime (70-year) excess cancer risk from continuous exposure to 1 ppbv of atmospheric perchloroethylene is from 2 to 72×10^{-6} ; and that the OEHHA best value for the upper bound cancer unit risk for perchloroethylene is $54 \times 10^{-6} \text{ ppb}^{-1}$;

WHEREAS, based on the best value of cancer unit risk and exposure to an outside annual average population-weighted concentration of 0.37 ppb, the OEHHA staff estimates a potential excess carcinogenic risk of up to 20 cancer cases per million people exposed over a 70-year lifetime to ambient perchloroethylene resulting in an estimated 600 potential excess cancers among a statewide population of approximately 30 million people over a 70-year period.

WHEREAS, for the reasons set forth in its evaluation, the OEHHA treats perchloroethylene-induced carcinogenesis as a nonthreshold phenomenon because the OEHHA found no evidence that there is a carcinogenic threshold level for perchloroethylene;

WHEREAS, upon receipt of the OEHHA evaluation, the staff of the Board prepared a report including and in consideration of the OEHHA evaluation and recommendations and in the form required by section 39661 of the Health and Safety Code and, in accordance with the provisions of that section, made the report available to the public and submitted it for review to the Scientific Review Panel (SRP) established pursuant to section 39670 of the Health and Safety Code;

WHEREAS, in accordance with section 39661 of the Health and Safety Code, the SRP reviewed the staff report, including the scientific procedures and methods used to support the data in the report, the data itself, and the conclusions and assessments on which the report was based; considered the public comments received regarding the report; and on June 10, 1991, adopted for submittal to the Board, findings which include the following:

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 SRP concurs with the Office of Environmental Health Hazard Assessment (OEHHA) in the California Environmental Protection Agency (Cal-EPA), 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 federal Clean Air Act as amended in 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 $72 \times 10^{-6} \text{ ppbv}^{-1}$ [0.3 to $10.6 \times 10^{-6} (\text{ug}/\text{m}^3)^{-1}$]. The DHS staff identified the best value of perchloroethylene cancer unit risk as $54 \times 10^{-6} \text{ ppbv}^{-1}$ [$8 \times 10^{-6} (\text{ug}/\text{m}^3)^{-1}$]. 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 compounds 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

<u>Compound</u>	<u>Unit Risk</u> (ppbv ⁻¹)	<u>Unit Risk</u> (ug/m ³) ⁻¹	<u>Date SRP Approved</u>
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 (54×10^{-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.

WHEREAS, the SRP found the staff report to be without serious deficiency, and the SRP agreed with the staff recommendation that perchloroethylene should be listed by the Air Resources Board as a toxic air contaminant, and found that, based on available scientific information, the perchloroethylene exposure level below which carcinogenic effects are not expected to occur cannot be identified;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, in consideration of the staff report, including the OEHHA's evaluation and recommendations, the available evidence, the findings of the SRP, and the written comments and public testimony it has received, the Board finds that:

1. There is evidence that perchloroethylene is a possible human carcinogen;

2. Health effects other than cancer are not anticipated at existing average perchloroethylene exposure levels in ambient outdoor air;
3. The OEHHA and the SRP agree that based on the upper 95 percent confidence limit of potency, the estimated range of lifetime (70 year) excess cancer risk from continuous exposure to 1 ppbv of atmospheric perchloroethylene is from $2-72 \times 10^{-6}$;
4. Although the OEHHA and the SRP have determined that the best value of the upper bound of the overall perchloroethylene cancer unit risk is $54 \times 10^{-6} \text{ppb}^{-1}$, the Board is unable to endorse this potency value because of the uncertainty surrounding the metabolic rate of perchloroethylene in humans;
5. Perchloroethylene is an air pollutant which, because of its carcinogenicity, may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health;
6. There is not sufficient available scientific evidence to support the identification of a threshold exposure level for perchloroethylene;
7. The risk assessments conducted by OEHHA and approved by the SRP are based on the best science available, but because of the inherent uncertainties associated with risk assessments and the resulting risk and potency values, the utmost degree of care must be taken to interpret and utilize risk values properly when making risk management decisions;
8. There is evidence that risk values could be misapplied in making risk management decisions, and the Board believes it should exercise leadership in providing an interpretation of the risk assessment values it endorses and the necessary tools and methodology to ensure the proper use of such values in risk management decisions by the districts and others and;
9. This regulatory action will have no significant adverse impact on the environment.

NOW, THEREFORE BE IT RESOLVED, that the Board hereby identifies perchloroethylene as a toxic air contaminant and adopts the proposed regulatory amendment to section 93000, Titles 17 and 26, California Code of Regulations, as set forth in Attachment A.

BE IT FURTHER RESOLVED, that the Board directs the Executive Officer to explore the need for extending its data collection and modeling activities throughout the state, in light of the hot spots information which is becoming available.

BE IT FURTHER RESOLVED, that the Board requests the OEHHA and the staff to conduct a public workshop within four months, preferably with the participation of at least one SRP member, in order to consider the scientific evidence and to ascertain whether any additional scientific evidence is available pertaining to the OEHHA and SRP recommended risk values, particularly the best value of upper bound perchloroethylene risk, in order to determine if any changes to their conclusions are warranted and to then report their decision to the Board.

BE IT FURTHER RESOLVED, if the OEHHA and the staff determine that changes to the risk values, particularly potency, are justified or that there is new scientific evidence regarding risk which was not previously presented, the matter shall be presented to the SRP for a revised determination prior to reporting back to the Board.

BE IT FURTHER RESOLVED, that the Board directs the Executive Officer to initiate a high priority work effort with the SRP, OEHHA, industry, local air districts, and the public to expand and improve the risk assessment information available to local air districts and others involved in making risk management decisions on toxic air pollutants, to develop recommendations for better using this information, considering the uncertainty inherent in risk values, and to report back to the Board within six months.

BE IT FURTHER RESOLVED, that the Board directs the Executive Officer to write to the local and regional air districts to communicate to them the action taken by the Board at this hearing, to express the Board's concerns regarding proper use of risk values in making risk management decisions, and to invite them to participate with us and others in the development of appropriate methodology and tools to use risk values properly in risk management decision making.

I hereby certify that the above is a true and correct copy of resolution 91-43, as adopted by the Air Resources Board.

Pat Hutchens 12/5/91
Pat Hutchens
Board Secretary