State of California
AIR RESOURCES BOARD

Resolution 87-91

November 12, 1987

Agenda Item No.: 87-14-1

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, ethylene oxide (1,2-epoxyethane, hereinafter "ethylene oxide") is emitted from many activities including sterilization of medical products, fumigation of spices, production of surfactants, and distribution of ethylene oxide;

WHEREAS, ethylene oxide will not break down in the atmosphere at a rate that would significantly reduce the resulting public exposure;

WHEREAS, pursuant to the request of the Board, the Department of Health Services (DHS) evaluated the health effects of ethylene oxide in accordance with Section 39660 of the Health and Safety Code;

WHEREAS, DHS concluded in its evaluation that ethylene oxide is an animal carcinogen and a probable human carcinogen; that health effects other than cancer are not expected to occur at current ambient levels of ethylene oxide; and that the maximum excess lifetime cancer risk from ethylene oxide exposure is estimated to range from 61 to 88 cases per million people exposed per 0.56 parts per billion (1 microgram per cubic meter);

WHEREAS, because there is compelling evidence of genotoxicity for ethylene oxide and there is experimental evidence for ethylene oxide acting as an initiator of tumorigenesis, DHS considers ethylene oxide-induced carcinogenesis to be a nonthreshold phenomenon;

WHEREAS, upon receipt of the DHS evaluation, staff of the Board prepared a report including and in consideration of the DHS 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 July 7, 1987, adopted for submittal to the Board findings which included the following:

"1. Ethylene oxide has been identified as an animal carcinogen and should be regarded as a potential human carcinogen.

2. Ethylene oxide is emitted into the air by a variety of stationary sources in California. Dispersion modeling of emissions from all known sources within an area of Los Angeles County indicates that nearly 7 million people were exposed to an estimated population-weighted annual mean concentration of 50 parts per trillion (ppt) (0.09 ug/m^3) of ethylene oxide in 1985. The maximum annual average concentration to which people were exposed was estimated to be 20,000 ppt (36 ug/m^3) near a large commercial emission source.

3. Based solely on its gas-phase reactivity, ethylene oxide has an atmospheric lifetime of approximately 200 days. Although possible reaction in solution or on surfaces could shorten this lifetime, based on available scientific evidence, ethylene oxide would still have an atmospheric lifetime of days to weeks.

4. Adverse health effects other than cancer are not known to occur at predicted concentrations of ethylene oxide in ambient outdoor air.

5. Based on available scientific information, an ethylene oxide exposure level below which carcinogenic effects are not expected to occur cannot be identified.

6. Based on an interpretation of available scientific evidence by DHS staff, the range of lifetime excess cancer risk from exposure to 0.56 ppb (1 ug/m^3) of atmospheric ethylene oxide based on the best animal estimate of risk and the upper 95% confidence limit is estimated to be 61 to 88 cases per million people exposed. These upper bound excess lifetime risks are health-protective estimates; the actual risk is likely to be below these values."

WHEREAS, the SRP found the ARB and DHS staff reports to be without serious deficiency, and the SRP agreed with the ARB staff recommendation that ethylene oxide be listed by the Air Resources Board as a toxic air contaminant, and found that based on available scientific information, an ethylene oxide 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 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 DHS' 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:

Ethylene oxide is an animal carcinogen and a probable human carcinogen;

Health effects other than cancer are not anticipated at existing ethylene oxide exposure levels in ambient outdoor air;

There is not sufficient available scientific evidence to support the identification of a threshold exposure level for ethylene oxide; and

Ethylene oxide 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; and

WHEREAS, the Board has determined, pursuant to the requirements of the California Environmental Quality Act and Board regulations, that this regulatory action will have no significant adverse impact on the environment.

NOW, THEREFORE BE IT RESOLVED, that the Board adopts the proposed regulatory amendment to Section 93000, Titles 17 and 26, California Administrative Code, as set forth in Attachment A.

I hereby certify that the above is a true and correct copy of Resolution 87-91, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

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 Ethylene Oxide as a Toxic Air Contaminant

Agenda Item No.: 87-14-1

Public Hearing Date: November 12, 1987

Response Date: N/A

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: Cary Albers
Board Secretary

Date: 6/17/88

Attachment A

Amend Titles 17 and 26, California Administrative Code, Section 93000 to read as follows:

93000. Substances Identified As Toxic Air Contaminants. Each substance identified in this section has been determined by the state board to be a toxic air contaminant as defined in Health and Safety Code Section 39655. If the state board has found there to be a threshold exposure level below which no significant adverse health effects are anticipated from exposure to the identified substance, that level is specified as the threshold determination. If the board has found there to be no threshold exposure level below which no significant adverse health effects are anticipated from exposure to the identified substance, a determination of "no threshold" is specified. If the board has found that there is not sufficient available scientific evidence to support the identification of a threshold exposure level, the "Threshold" column specifies "None identified."

Substance	Threshold Determination
Benzene (C_6H_6)	None identified
Ethylene Dibromide ($BrCH_2CH_2Br$; 1,2-dibromoethane)	None identified
Ethylene Dichloride ($ClCH_2CH_2Cl$; 1,2-dichloroethane)	None identified
Hexavalent Chromium (Cr(VI))	None identified
Asbestos [asbestiform varieties of serpentine (chrysotile) riebeckite (crocidolite) cummingtonite-grunerite (amosite), tremolite, actinolite, and anthophyllite]	None identified
Dibenzo-p-dioxins and Dibenzofurans chlorinated in the 2,3,7 and 8 positions and containing 4,5,6 or 7 chlorine atoms	None identified
Cadmium (metallic cadmium and cadmium compounds)	None identified
Carbon tetrachloride* (CCl_4; tetrachloromethane)	None identified
Ethylene oxide (1,2-epoxyethane)	None identified

State of California

M E M O R A N D U M

To : Gordon Van Vleck
Secretary
Resources Agency

Date : August 24, 1988

Subject : Filing of Notice of Decisions of the Air Resources Board

Cary Allison
Board Secretary
From : **Air Resources Board**

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS

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