

June 16, 2006

Re: Invitation for comments on the “short list” candidates for the Ethylene Oxide review panel EPA Science Advisory Board (SAB)

71 FR 10500-10501 March 1, 2006

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More information is available at:
http://www.epa.gov/sab/panels/ethylene_oxide_rev_panel.htm

This letter is supported by the following worker and public health advocates:

- Jennifer Sass, Natural Resources Defense Council, Wash, DC
- Amanda Hawes, Toxics Chair WORKSAFE, CA
- Kathleen Burns, Director, ScienceCorps, Lexington, MA
- Bill Borwegen, Occupational Health and Safety Director, Service Employees International Union, Wash, DC
- Michael Jacobson, Center for Science in the Public Interest, Wash, DC
- Michael R. Harbut, Chief, Center for Occupational and Environmental Medicine, Wayne State University (For ID Only)
- Bill Ravanese, Boston Regional Director, Health Care Without Harm-Boston
- Jane Houlihan, Vice President for Research, Environmental Working Group
- Joe DiGangi, Environmental Health Fund
- David Michaels, Department of Environmental and Occupational Health, George Washington University
- David LeGrande, Director, Occupational Safety and Health, Communications Workers of America
- Michael J. Wright, Director of Health, Safety and Environment, United Steelworkers
- Jeanne Rizzo, Executive Director, Breast Cancer fund
- Ted Schettler, Science Director, Science and Environmental Health Network
- Susan Kegley, Senior Scientist, Pesticide Action Network North America
- James August, American Federation of State, County, and Municipal Employees
- David Egilman, Clinical Associate Professor Brown University
- Darryl Alexander, Health and Safety, American Federation of Teachers, AFL-CIO
- Jacqueline Nowell, Director, Occupational Safety and Health Office, United Food and Commercial Workers International Union
- Lin Kaatz Chary, Environmental Strategies and Consulting, Gary, IN
- Susanna Rankin Bohme, Brown University, Providence, RI
- Theo Colborn, President, The Endocrine Disruption Exchange (TEDX)

- Anthony D. LaMontagne, Associate Professor, Centre for Health & Society, School of Population Health University of Melbourne, AUSTRALIA
- Michael Fry, Senior Scientist, American Bird Conservancy, USA
- Linda Stierle, CEO, American Nurses Association
- Aimee Code, Northwest Coalition for Alternatives to Pesticides, OR, USA

Overview of ethylene oxide toxicity

Ethylene oxide (EtO) is a known carcinogen, a flammable gas, used primarily in the production of antifreeze and polyester. It is one of the highest production volume chemicals in the U.S., with the U.S. accounting for roughly one-half of global production. Most EO is used in the production of ethylene glycol (60–95%), with smaller amounts being used to produce nonionic surfactants, glycol ethers, higher glycols, ethanolamines, fuel additives, and other industrial chemicals. Although accounting for only 1% by volume, most human exposures are through its use as a sterilizer in hospitals and as a pesticide to control insects in some stored agricultural products.

Exposure of the general population is a risk through consumer products, vehicle emissions, airborne releases from industrial sources (approximately 150 industrial facilities release airborne EtO in the U.S.), residues in cosmetic and skin care products, and from food fumigated with EtO pesticide (spices, cocoa, flour, and dried fruit). The World Health Organization in 2003 estimated ambient environmental exposures to be in the range of 0.2–0.3 $\mu\text{g}/\text{m}^3$, but far higher for populations residing near air pollution point sources, such as hospitals, sterilization facilities, and ethylene glycol production facilities (2–20 $\mu\text{g}/\text{m}^3$).¹

The toxic effects of EtO include acute and chronic effects, and both local and systemic effects. The Center for Disease Control and Prevention (CDC) reports that, “breathing low levels of ethylene oxide for several months to years has caused irritation of the eyes, skin, and respiratory passages and affected the nervous system (headache, nausea, vomiting, memory loss, numbness, etc.). At higher levels of exposure for shorter periods, effects are similar but may be more severe. There is some evidence that exposure to ethylene oxide can cause a pregnant woman to have a miscarriage. Animal studies indicate that in addition to irritation of the respiratory passages, nervous system effects, and reproductive effects, the kidneys, adrenal gland, and skeletal muscles may be affected from long-term exposure to ethylene oxide.”²

Summary of comments:

Thank you for the opportunity to provide comments on the candidates for the Ethylene Oxide EPA Science Advisory Board (SAB). This SAB will review the cancer risks from EtO.

The SAB short list of nominees includes a large proportion of industry consultants, many with overlapping areas of expertise in quantitative risk assessment and/or mathematical modeling.

¹ LaMontagne AD, Steenland NK, Kelsey KT. Ethylene Oxide. Chapter 27. Environmental and Occupational Medicine, 4th Edition. Edited by WN rom. Lippincott-Raven Publishers, Philadelphia. in press, 2006

² <http://www.atsdr.cdc.gov/tfacts137.html>

Five of the nominees have financial conflicts: Gargas, Garabrant, Kirman, Schnatter, and Teta. Four nominees routinely consult for industry: Klaunig, Swenberg, Clewell, and Starr. These nine individuals should not be selected for the expert committee, since several represent a coordinated perspective, several have overlapping expertise, and since at least five to our knowledge have a direct financial relationship with the EtO and petrochemical industry.

Gargas, Kirman, and Teta are consultants to the EtO industry

In their biographies on the EPA website, both Mary Jane Teta and Michael Gargas failed to declare their financial relationship with The Ethylene Oxide Industry Council (EOIC), the industry trade association that serves the interests of the ethylene oxide manufacturers. Teta of Exponent, Inc., and Gargas and Christopher Kirman of the Sapphire Group have all served on this industry Council.³ In his EPA biography, Mr. Kirman appropriately declared these conflicts as follows, “Mr. Kirman has served as a consultant to the American Chemistry Council's Ethylene Oxide Industry Council (ACC EOIC) on ethylene oxide, including preparation of a cancer and non-cancer risk assessment for ethylene oxide that was submitted to the USEPA IRIS office in 2001. Mr. Kirman continues to consult to the ACC EOIC on ethylene oxide issues.”

These direct financial conflicts should be grounds for elimination of these three individuals from this SAB. Moreover, the failure of Teta and Gargas to publicly declare this relationship constitutes the withholding of information that the public and EPA has the right to know.

Gargas, Kirman, and Teta were involved in the development of an earlier draft of the EPA assessment

In February 2001, the EPA announced that external parties (outside the government) had been invited to develop assessments that EPA would review for use on IRIS:

“Currently, external party assessments are addressing ethylene oxide, ethylbenzene, styrene, toxaphene, hexachlorobenzene, and hexahydro-1,3,5-trinitro-triazine (“RDX”). When complete, EPA will consider these documents, in whole or in part, as possible sources or supporting documents for IRIS assessments.”⁴

The first draft of the ethylene oxide assessment (2001) was prepared for the IRIS database⁵ by the EOIC, whose consultants included Gargas, Kirman, and Teta. Paul Gilman, science adviser to the EPA Administrator, told a reporter of his dissatisfaction with the industry submissions: “[I]t is taking staff as much or more time to work with the

³ Email from William Gullledge, American Chemistry Council to L Greer. Subject: Ethylene Oxide – meeting on IRIS review of EO. November 7, 2001

⁴ GPO. Federal Register. Office of the Federal Register, National Archives and Records Administration, United States Government Printing Office 2001;66(36):11165-11167

⁵ The IRIS database contains EPA assessments for approximately 540 chemicals. Information on IRIS is used by EPA regulators and others worldwide, in combination with exposure data, to set cleanup standards and various exposure standards for air, water, soil, and food.

outside parties as it does to develop in-house toxicological reviews, Gilman said. To date, the process has not saved the time or resources it was designed to save”.⁶

It was a mistake for EPA to initially allow industry to draft the assessments of its products. It would now be a mockery of peer-review and a violation of public trust to invite current or former EOIC consultants to serve on the SAB review committee.

Gargas, Kirman, and Teta have publicly taken a position on the quantitative cancer risk of EtO.

The SAB will fail to solicit a diversity of viewpoints and expertise if it includes Gargas, Kirman, and Teta. All three are co-authors on a scientific article that takes a public position on the cancer risks of low levels of EtO exposure, including the shape of the curve and the quantitative estimate of cancer potency. They conclude that the weight of evidence supports a nonlinear assessment, and that there is a “safe” exposure of ethylene oxide at low doses.⁷ In fact, the authors report that, “lifetime exposures to EO concentrations of 37 $\mu\text{g}/\text{m}^3$ (21 ppb) are likely to be without an appreciable increased risk of cancer” (Kirman et al, 2004). This value calculated by the ethylene oxide industry contractors is exactly the same as the one that was recommended by EPA in the 2001 draft submitted by the EOIC. Kirman et al. offer a range of potency estimates that are, “approximately 3.2 to 32-fold lower than the unit risk value calculated using the default assumption of linearity at low concentrations”.

The Table below shows the values recommended in the EPA Draft in 2001 and those recommended by the industry-sponsored authors (Kirman et al, 2004).

	Cancer risk estimate per $\mu\text{g}/\text{m}^3$ of EO	Excess cancer cases per 10 million people exposed to 1 $\mu\text{g}/\text{m}^3$ over a lifetime.	Air conc. corresponding to 1 in 1 million excess cancer risk ($\mu\text{g}/\text{m}^3$)
EPA (2001) ⁸	1.8×10^{-7}	1.8	1.9 – 60
Kirman et al (2004)	1.4×10^{-8} - 1.4×10^{-7}	0.14 - 1.4	7.1 – 71
Kirman et al (2004)	4.5×10^{-7} (linear, not author recommended)	4.5	2.2
NIOSH	occupational	recommended exposure limit (REL)	180 $\mu\text{g}/\text{m}^3$ 8-hr TWA
WHO ⁹	general population	exposure estimates	0.2-20 $\mu\text{g}/\text{m}^3$

The World Health Organization (WHO) has estimated that the general population is exposed to between 0.2 and 20 $\mu\text{g}/\text{m}^3$ of EtO from consumer products, food contaminated with EtO fumigant, and air pollution emissions. These levels are within the levels associated with a 1 in 1 million excess cancer risk according to the EPA Draft

⁶ Phibbs P. EPA to reform management of database used for federal, state regulations. The Bureau of National Affairs, Inc. Washington, DC, September 3 2002;170:B-1

⁷ Addressing nonlinearity in the exposure-response relationship for a genotoxic carcinogen: cancer potency estimates for ethylene oxide. Kirman CR, Sweeney LM, Teta MJ, Sielken RL, Valdez-Flores C, Albertini RJ, Gargas ML. Risk Anal. 2004 Oct;24(5):1165-83.

⁸ Biologically-based dose-response model using a linear departure from the quadratic below the point of departure

⁹ WHO. *Concise International Chemical Assessment Document 54: Ethylene Oxide*. Geneva: World Health Organisation. 2003: 69

(2001) and the Kirman et al authors (see Table above). This suggests that at current exposure rates, sensitive populations are unlikely to be adequately protected from EtO-related health effects including cancer.

The National Institute of Occupational Safety and Health (NIOSH) recommends average workplace air not exceed $180 \mu\text{g}/\text{m}^3$ (0.1 ppm) EtO averaged over a five-day work week (8-hour time-weighted average, TWA). This value is only 2.5-fold more permissive than the upper bound air concentration that is considered to be without appreciable risk by Kirman et al for continuous population exposure ($71 \mu\text{g}/\text{m}^3$). Kirman et al effectively treat the general population including the young, the sick, and the elderly as if they were strong healthy workers. This is unlikely to be protective of the general population and suggests considerable bias towards industry interests to weaken emission and cleanup requirements.

Gargas and Kirman are financially conflicted through their employment with Sapphire Group, Inc.

Given that the Sapphire Group, Inc. website explicitly states that it serves its clients through participation on government advisory committees, and given that one of its clients is the ethylene oxide industry, it is reasonable to conclude that both Gargas and Kirman are serving on the SAB in the interests of their clients, and not as independent scientists.

Both Gargas and Kirman are both employed by Sapphire Group, Inc. Its website describes its mission as follows: “The Sapphire Group provides consulting services to business clients around the world that manufacture, use, transport, and dispose of chemicals.”¹⁰ One of these clients is the ethylene oxide industry. In addition to publishing scientific articles that support the position of its clients, “The Sapphire Group provides consulting services to numerous businesses, industries, and associations as well as participation on [government] panels and advisory committees...”¹¹ Moreover, the Sapphire Group provides its clients with, “assistance with regulatory, litigation and community-related issues”, as well as, “product support through scientific advocacy”.¹²

This financial relationship is not public declared in the biography for either Gargas or Kirman posted on the EPA website.¹³

Garabrant and Schnatter have financial conflicts

David Garabrant has a history of industry consulting, and has served as an expert witness to corporate defendants. Between 2001-2005, Garabrant was personally paid over \$264,800 for his consulting for Ford and General Motors in asbestos litigation. He is now conducting a \$15 million study on dioxin hazards that is funded by Dow Chemical. Since Dow Chemical is the world’s largest producer of ethylene oxide¹⁴, this constitutes a direct financial conflict. Garabrant’s financial relationship is not disclosed on the EPA website, an apparent violation of the law.

¹⁰ Our Mission.

<http://thesapphiregroup.com/home/showpage.asp?id=2&name=aboutus&ref=1.0§ion=1>

¹¹ Whom We Serve.

<http://thesapphiregroup.com/home/showpage.asp?id=2&name=aboutus&ref=1.0§ion=1>

¹² Welcome. <http://thesapphiregroup.com/home/showpage.asp?id=2&name=aboutus&ref=1.0§ion=1>

¹³ http://www.epa.gov/sab/panels/ethylene_oxide_rev_panel.htm

¹⁴ <http://www.dow.com/ethyleneoxide/about/>

Robert Schnatter works for ExxonMobil. Since emissions from fuel combustion are a significant source of EtO exposure for the general population, this represents a direct financial conflict.

Klaunig, Swenberg, Clewell, and Starr are industry consultants

In addition to the five aforementioned nominees with financial conflicts, the additional nominations of Thomas Starr, James E. Klaunig, James Swenberg, and Harvey J. Clewell III adds additional industry consultants. All six of these individuals should be removed, since they represent a coordinated industry perspective.

Even where scientists may not have a disqualifying conflict of interest, they may nevertheless harbor a strong industry bias. Committee members who earn their living as corporate consultants or employees may seek to downplay the toxic effects of EtO, or to overemphasize or focus solely upon the economic benefits of EtO, and may not be open to objective discussion of risks and alternatives.

Suggested nominees with relevant expertise, and without financial conflicts:

Peter Infante, DDS, Dr.P.H. (epidemiologist)

Adjunct Prof Environmental and Occupational Health,
George Washington University, School of Public Health
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Franklin E. Mirer, PhD, CIH (toxicologist, industrial hygienist)

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John R. Froines, Ph.D. (chemist, toxicologist)

Director of the Southern California Particle Center, the Center for Occupational and Environmental Health and the Asthma Consortium, UCLA
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Karl Kelsey, MD (genetic epidemiology)

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The scientific credibility of the EPA is damaged by committees with real or perceived bias

The mission of the SAB is to provide credible and independent scientific analysis and advice to government. The Board cannot accomplish this vital mission if its objectives and deliberations reflect strong bias. Committees whose members have conflicts of interest or a strong bias toward the perspective of regulated industries

undermine the credibility of the EPA. SAB should make strong efforts to protect its objectivity, integrity, independence, and competence as its most valuable asset. The scientific credibility of the SAB and the EPA is damaged by committees with real or perceived bias.

By law, EPA committees must be composed in order to ensure that industry bias is publicly disclosed, minimized, and eliminated if possible.

The Federal Advisory Committee Act (FACA) imposes requirements on agencies when they establish or utilize any advisory committee, which is defined as a group of individuals, including at least one non-federal employee, that provides collective advice or recommendations to the agency. 5 U.S.C. App. II, § 3(2). When an agency seeks to obtain such advice or recommendations, it must ensure the advisory committee is "in the public interest," Id. App. II, § 9(2), is "fairly balanced in terms of points of view represented and the function to be performed," id. § 5(b)(2), and does not contain members with inappropriate special interests. Id. § 5(b)(3).

Committee membership should exclude financially conflicted members as much as possible, so that committees are largely composed of scientists able to provide a fair and complete review of all relevant data or issues.

If industry representatives have specific knowledge or expertise of value to the deliberations of a committee, then invitations to address the committee during public meetings are appropriate.

Respectfully,

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