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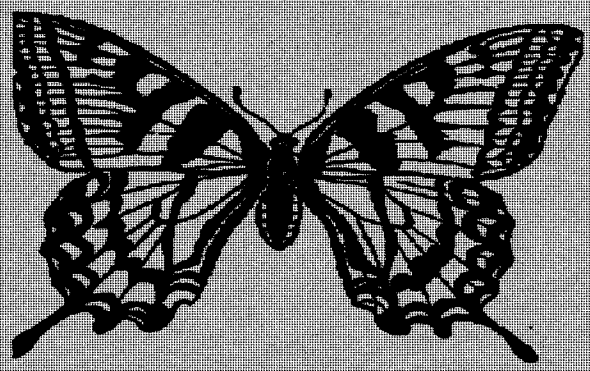
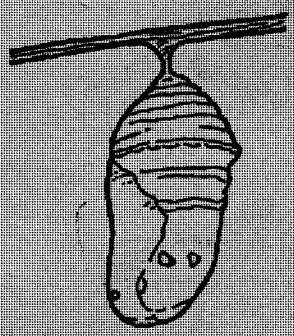
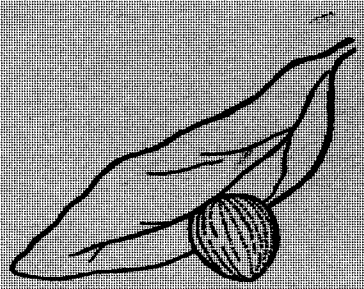
EPA

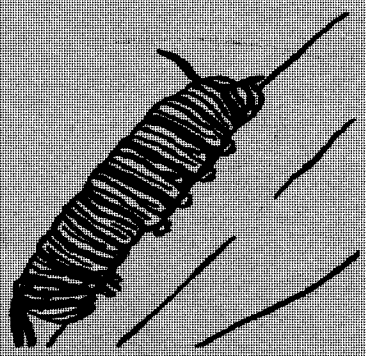
SCIENCE ADVISORY BOARD
FY1998 ANNUAL STAFF REPORT

SAB in Transition









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This report is a staff summary of activities of the U.S. Environmental Protection Agency's Science Advisory Board for Fiscal Year 1998, with projections for Fiscal Year 1999. This report has not been reviewed by the Board or the Agency, and should not be construed as representing the views of either organization.

FOREWORD: TRANSITIONS

Transitions occur within any institution. Leadership changes; directions are altered; new approaches are introduced; and new products appear.

Fiscal Year 1998 (FY 98) was definitely a time of transition for the USEPA Science Advisory Board (SAB).

New Leadership: Dr. Joan Daisey of the Lawrence Berkeley National Laboratory accepted the reins as Chair of the SAB Executive Committee. She succeeded Dr. Genevieve Matanoski of Johns Hopkins University who, for the past four years, set a steady, productive course for the Board. The FY98 Annual Report documents information about all of the membership changes on the Board.

New Directions: Two months after becoming SAB Chair, Dr. Daisey conducted the SAB's first Strategic Planning Retreat, a three-day affair in which collective decisions were reached on changes in direction and operation of the Board. This year's Annual Report documents several examples of those changes being implemented.

New Approaches: The SAB committed itself to address in FY98 several important problems/opportunities; e.g., the need for more consistent timeliness of its reports, the need for greater awareness of SAB activities, and the need/opportunity to improve its advice by leveraging its resources through interaction with other advisory groups. The Annual Report documents how these new approaches have improved the operations and effectiveness of the SAB.

New Products: This year the SAB extended its product line to include publication of one of its reports in a more attractive and durable format and introduced the "one-pager," a means of announcing the release of selected SAB reports, to broaden the awareness of and access to SAB products. The Annual Report provides examples of these new products.

This FY98 Annual Report, then, is full of information on what is new at the SAB. At the same time, the Annual Report captures the "traditional activities" that were themselves "new activities" just a few years ago. Therefore, this year's "Transitions" should be viewed as a part of the continuing development of and exploration by an energetic, vibrant, and improving institution dedicated to advising the Agency on how to do the right thing right...from a scientific point of view.

Donald G. Barnes, PhD
Staff Director
USEPA Science Advisory Board

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1. EXECUTIVE SUMMARY

1.1 Introduction to the Report

This Annual Report provides a succinct introduction to the Science Advisory Board (SAB); a summary of the SAB activities for Fiscal Year 1998; and offers a near-term projection for future SAB activities.

Section 2 is a brief introduction to the Report. Section 3 provides background information on the SAB, its organization, history, membership, and resources. Section 4 contains summaries of the activities of each SAB Committee during FY98, details the major activities illustrating the SAB "in transition" and notes changes in the SAB Staff Office. Section 5 provides some projections for FY99.

This Report also includes several specialized appendices, containing: charters and leadership information for the Committees; membership information; organizational charts; guidelines on service on the SAB; lists of meetings; abstracts of FY98 reports; and biographical information about the SAB Staff.

1.2 Introduction to the Board

The purpose of the Board is to provide highly qualified, independent technical advice to the EPA Administrator on the scientific, engineering, and economic underpinnings of Agency positions (see charters in Appendix A). The SAB often functions as a peer review panel, assessing the technical rationale underlying current or proposed Agency positions. In recent years it has initiated a number of activities on its own: e.g., a commentary on strategic planning in the Office of Research and Development's engineering program, retrospective studies on the impacts of past reports by the Radiation Committee, and a self-study of the Board.

The SAB was formally chartered in 1978 by the Environmental Research, Development, and Demonstration Authorization Act (ERDDAA), although its roots extend back to the birth of EPA in 1970. The Board is a Federal Advisory Committee and must comply with the Federal Advisory Committee Act (FACA). The Board's membership is composed of non-Federal scientists, economists, and engineers appointed by the EPA Administrator. The Guidelines for Service on the SAB are included in Appendix B1. Appendix B2 describes the various ways in which experts are affiliated with the Board. The 102 Members of the Board (see Appendix B3) operate through ten standing Committees, coordinated through an Executive Committee (see the organizational chart in Appendix C and information on Staff Support and Committee Leadership in Appendix D). The Members of the Board are some of the most qualified technical experts in the country, as evidenced by the credentials of the FY98 Committee Chairs (see Table II, pg. 10). The work of the Board is supported by some 300 Consultants (see Appendix B4), who are non-governmental scientists, engineers, and economists appointed by the SAB Staff Director. Technical experts employed by the Federal Government who have special skill or knowledge in particular areas participate as Federal Experts, as needed.

The Board provides highly qualified, independent technical advice to the Administrator of the EPA on the scientific, engineering, and economic underpinnings of Agency positions.

The SAB's operations are supported by a Staff Office of 21 employees and an FY98 budget totaling some $2.4 million. These resources enabled the Board to conduct 51 meetings in FY98 (of which 8 were public conference calls, 42 were public meetings,

and 1 closed meeting) and issue 11 full reports, 19 short reports (generally less than 10 pages, including 3 Letter Reports, 2 Commentaries, 5 Advisories, and 9 Notifications of Consultation (see Tables IV and V).

The SAB carries out projects at the request of the Agency and Congress as well as on its own initiative. In recent years, the number of requests for SAB action have well exceeded the number that the Board can address. Therefore, the Board has adopted criteria to establish priorities among the various requests, based on the degree to which such requests meet the criteria.

a) Impact overall environmental protection
b) Address novel scientific problems or principles
c) Integrate science into Agency actions in new ways
d) Influence long-term technological development
e) Deal with problems that transcend Federal agency or other organizational boundaries.
f) Strengthen the Agency's basic capabilities
g) Serve Congressional and other leadership interests
h) Deal with controversial issues

The reports produced by the SAB have positively impacted many aspects of the Agency's operations and policies:

a) The rigor of the Agency's technical positions
b) The allocation of Agency resources for scientific/technical activities
c) The directions taken by the Agency in emerging science policy
d) The directions taken by the Agency in planning
e) The directions and form of public debate on scientific, engineering, and economic issues

With all of these activities, attention and impacts, the Board has maintained a broad base of support both within and outside the Agency.

1.3 Review of FY98 Activities

During FY98 the SAB's various Committees and subcommittees conducted 51 public meetings which were announced in the Federal Register. This number includes 8 public conference calls. These efforts resulted in 30 reports. A wide variety of topics were covered, from a procedure for assessing ecological risks in the environment to approaches for anticipating environmental problems tomorrow. Appendices E and F provide a full listing of FY98 SAB meetings and reports (with abstracts).

The Board took several steps in Fiscal Year 1998 (FY 98) to continue with its transition into the future.

New Leadership: Dr. Joan Daisey of the Lawrence Berkeley National Laboratory succeeded Dr. Genevieve Matanoski of Johns Hopkins University as Chair of the Science Advisory Board.

New Directions: The EC conducted its first Strategic Planning Retreat and identified changes in the direction and operation of the Board to provide advice that is more effective and timely.

New Approaches: The SAB committed itself to leveraging its resources through interaction with other advisory groups.

New Products: The SAB extended its product line to include a number of new products, including publication of one of its reports in a more attractive and durable format and by introducing the one-pager to announce the release of selected SAB reports, as a means of broadening the awareness of and access to SAB products.

The Staff Office was also active in extending its range through the increased use of

electronic media by redesigning its web page by and its use of the Internet to conduct business.

1.4 Projections and Conclusions

Dr. Joan Daisey began her term as Chair of the SAB. Her first action was to conduct a Strategic Planning Retreat in November, 1997 in order to ensure a smooth transition between the former leadership and the new leadership and to plot a course that will carry the SAB into the next century.

The agenda for FY99 is filling up fast and will include important reviews, as well as activities to assist the Agency to interpret and implement the far-reaching Integrated Risk Project (IRP) report. To accomplish this work, and to improve the quality and utility of its advice, the SAB will continue to explore ways to work "quicker, cheaper, smarter". Changes are also anticipated in the Staff Office. As these changes take place, our goal remains constant: to help insure that environmental policy decisions are based on sound scientific foundations.

2. INTRODUCTION TO THE REPORT

2.1 Purpose of the Report

The Science Advisory Board (SAB) is a legislatively mandated group of non-governmental scientists, engineers, and economists charged with providing independent technical advice on environmental issues to the EPA Administrator and others, (e.g., Congressional committees) to help inform their decisions. Generally, the SAB does not get involved in or provide advice on regulatory policy aspects of problems confronting the Agency, because such matters are the province and responsibility of the EPA Administrator. Additional details of the objectives, responsibilities, composition, and activities of the SAB and its two separately mandated entities (the CASAC and the Council) are included in Appendix A.

Informed observers acknowledge the SAB's remarkable history and its continuing importance in the protection of public health and the environment. However, some people both within and outside of the Agency are hard-pressed to describe the extent of the Board's activities or the detailed nature of its findings. This is due, in part, to the complex structure of the Board and the aperiodic issuing of its reports. To some, the SAB is viewed as a hurdle which must be cleared on the way to issuing regulations; much like having to defend one's thesis on the way to getting an advanced degree. To others, the SAB is seen as a court of last resort in which competing scientific arguments are objectively and dispassionately evaluated.

For some puzzled observers of the SAB, the biggest problem is simply finding out "What does the SAB do?" A somewhat flippant, but accurate, answer to that question is: "The SAB makes a difference." For example, the SAB makes a difference in the type and conduct of scientific and engineering research at EPA. The SAB makes a difference in the way that resulting data are interpreted and used to inform regulatory and other decisions. The SAB also makes a difference to SAB Members and Consultants (M/Cs) and SAB staff by giving them the satisfaction of seeing their information and guidance used appropriately by the Agency to better address environmental problems.

In broad terms, this Report is intended to reveal the SAB to a wide audience: to those both inside and outside the Agency, to those who understand the Board, to those who think they understand the Board, and to those who don't understand the Board. The intent is that each reader gain a broader perspective of the SAB, its activities, and its impact.

More specifically, the purpose of this Annual Report of the Science Advisory Board Staff is three-fold:

a) To provide a succinct introduction to the SAB.
b) To provide a summary of the SAB's activities for FY98.
c) To offer a near-term projection of future SAB activities.

The Report is designed to provide the written equivalent of "a group photo" of the SAB–its people, its products, and its prospects–in sufficient detail that the interested reader can distinguish the major features and identify paths for investigating the finer details.

2.2 Content of the Report

The Report consists of five principle sections, plus appendices supplementing the discussion in the main sections. Following the Executive Summary (Section 1) and this Introduction (Section 2), Section 3 provides basic background information on the SAB. Here the reader will find brief discussions on the history of the Board, its organization and Membership, and its principal activities and procedures.

Specific examples are described that illustrate the way in which the SAB positively impacts the functions and operations of the Agency. Section 4 focuses on SAB activities during FY98. This portion of the Report contains descriptions of the activities of each of the Board's Committees during the past year. In addition, changes in the SAB Staff assignments and changes in the operation of the Office are highlighted. Section 5 provides a glimpse into what FY99 likely holds in store for the Board.

The Appendices contain important information, such as organizational charts, membership lists, abstracts of SAB reports, and the like. These Appendices provide a source of more detailed information about specific aspects of the SAB.

3. INTRODUCTION TO THE BOARD

3.1 SAB Formation, Authority and Function

The SAB was established by Congress to provide independent scientific and engineering advice to the EPA Administrator on the technical basis for EPA regulations. Expressed in terms of the parlance of the risk assessment/risk management paradigm of decision making (National Research Council, *Managing Risk in the Federal Government*, 1983), the SAB deals with risk assessment issues (hazard identification, dose-response assessment, exposure assessment and risk characterization) and only that portion of risk management that deals strictly with the technical issues associated with various control options. Issues of Agency and Administration policy are generally beyond the scope of SAB mandate and involvement.

The SAB, in its present form, was established in 1978 by the Environmental Research, Development, and Demonstration Authorization Act (ERDDAA) (42 U.S.C. 4365). Predecessor bodies date back to the early 1970s.

As a practical matter, the function of providing credible technical advice to EPA and Congress antedates ERDDAA and its requirements for an SAB. SAB's roots can be traced back through various predecessor committees within EPA and prior to the creation of EPA into other agencies, such as the (then named) Department of Health, Education and Welfare. Since 1978, however, the SAB has operated as a Staff Office, reporting directly to the Administrator.

In carrying out the mandate of ERDDAA, the SAB provides "such scientific advice as may be requested by the Administrator, the Committee on Environment and Public Works of the United States Senate, or the Committees on Science and Technology, Interstate and Foreign Commerce, or Public Works and Transportation of the House of Representatives." Because the Science Advisory Board is a Federal Advisory Committee, it must comply with the Federal Advisory Committee Act (FACA) (5 U.S.C. App. C) and related regulations. Consequently, the Board has an approved charter (which must be renewed every two years), announces its meetings in the *Federal Register*, and provides opportunities for public comment on issues before the Board.

Members of and Consultants to the SAB constitute a distinguished body of scientists, engineers, and economists who are recognized, non-governmental experts in their respective fields. These individuals are drawn from academia, industry, state government, and environmental communities throughout the United States and, in some limited cases, other countries. (See Appendices B3 and B4 for a listing of Members and Consultants, respectively).

Increasingly, the Agency has placed a premium on basing its regulations on a solid scientific foundation. Consequently, over the past 20 years the SAB has assumed growing importance and stature. It is now formal practice that many major scientific points associated with environmental problems are reviewed by the SAB. For example, the Clean Air Act Amendments of 1990 (CAAA) require that technical aspects of decisions related to all National Ambient Air Quality Standards (NAAQS) be reviewed by the Clean Air Scientific Advisory Committee (CASAC), which is administratively housed within the SAB.

Generally, the Board functions as a technical peer review panel. The SAB conducts its business in public view and benefits from public

TABLE I SAB Leadership Over the Past Two Decades

Executive Committee Chairs	Affiliation	Dates
Dr. Joan Daisey	Lawrence Berkeley Laboratory	1997-present
Dr. Genevieve Matanoski	Johns Hopkins University	1993-1997
Dr. Raymond Loehr	University of Texas	1988-1993
Dr. Norton Nelson	New York University	1983-1988
Dr. Earnest Gloyna	University of Texas	1981-1983
Dr. John Cantlon	Michigan State University	1979-1981
Dr. Emil Mrak	University of California	1974-1978

SAB Staff Directors	Dates
Dr. Donald Barnes	1988-present
Dr. Terry Yosie	1981-1988
Dr. Richard Dowd	1978-1981
Dr. Thomas Bath	1975-1977

input during its deliberations. Through these public proceedings Agency positions are subjected to critical examination by leading experts in various fields in order to test their currency and technical merits. At the same time, the SAB recognizes that EPA is often forced to take a policy action to avert an emerging environmental risk before all of the rigors of scientific proof are met. To delay action until the evidence amounts to incontrovertible proof might court irreversible ecological and health consequences. In such cases, the Agency makes certain assumptions and extrapolations from what is known in order to reach a rational science policy position regarding the need (or lack thereof) for regulatory action. In such cases, the SAB serves as a council of peers to evaluate the soundness of the technical basis of the science policy position adopted by the Agency.

3.2 SAB Organization and Membership

The SAB Charter (Appendix A1) includes the following statements:

a) "The objective of the Board is to provide advice to EPA's Administrator on the scientific and technical aspects of environmental problems and issues".

b) "The Board will consist of a body of independent scientists and engineers [and now economists] of sufficient size and diversity to provide the range of expertise required to assess the scientific and technical aspects of environmental issues".

c) "No Member of the Board shall be a full-time employee of the Federal Government."

In addition, the Charter requires formation of an Executive Committee and inclusion of the Clean Air Scientific Advisory Committee and the Advisory Council on Clean Air Compliance Analysis (COUNCIL) (see separate charters, also in Appendix A). Otherwise, the Board may organize itself as needed to meet its responsibilities.

The Board's Executive Committee serves as the focal point to coordinate the scientific

reviews by the Board's standing committees. Appendix C contains a chart of the FY98 SAB organization. The Executive Committee meets to act on Agency requests for reviews, to hear briefings on pertinent issues, to initiate actions/reviews by the Board which it feels are appropriate, and to approve final reports prior to transmittal to the Administrator. [Reports from the CASAC and the Council are submitted directly to the Administrator, without need for prior Executive Committee review or approval.]

Five Committees have historically conducted most Science Advisory Board reviews:

a) Clean Air Scientific Advisory Committee (CASAC): Mandated by the 1977 Clean Air Act Amendments
b) Ecological Processes and Effects Committee (EPEC
c) Environmental Engineering Committee (EEC)
d) Environmental Health Committee (EHC)
e) Radiation Advisory Committee (RAC)

Between 1986 and 1990, five additional committees were added:

a) Integrated Human Exposure Committee (IHEC): Mandated in the Superfund Amendments and Reauthorization Act in FY86
b) Research Strategies Advisory Committee (RSAC): Requested by the Administrator in response to the Board's Future Risk report in FY98
c) Drinking Water Committee (DWC): Evolved from the EHC in FY90
d) Advisory Council on Clean Air Compliance Analysis (Council): Mandated in the 1990 Clean Air Act Amendments
e) Environmental Economics Advisory Committee (EEAC): Requested by the Administrator in response to the Board's *Reducing Risk* report in FY90

The Board supplements the activities of these committees with a variety of subcommittees, as well as with *ad hoc* committees, as needed.

The Board has continually and successfully recruited top technical talent to fill its leadership positions. Those scientists and engineers who have led the SAB (and predecessor organizations) for the past 23 years are listed in Table I. Table II testifies to the caliber of individuals who served as chairs of SAB Committees in FY98.

The number of Members is flexible. In FY98 SAB consisted of 102 members appointed by the Administrator for two-year terms, renewable for not more than two two-year terms. Service as Committee Chair can lead to an additional four years of continuous service. A formal guideline on Membership service was adopted by the Executive Committee in FY93 and has been followed by the Administrator in making appointments (see Appendix B1).

Over 300 technical experts, invited by the Staff Director, serve on an "as needed" basis as Consultants to the Board on various issues where their expertise is relevant. The number of Consultants is flexible, and their one-year terms can be renewed indefinitely. Consultants are required to meet the same standards of technical expertise as do the Members. The term "Member and Consultant" (M/C) is used throughout this annual report to refer to these experts. Appendices B3 and B4 contain a list of the FY98 SAB Members and Consultants, respectively. Nearly all of them serve as Special Government Employees (SGEs), subject to all relevant Federal restrictions, including the conflict of interest statutes (18 U.S.C. Sections 202-209).

In some few cases, the SAB also accesses experts via the route of Federal Expert and Invited Expert Resources. These categories are described in greater detail in Appendix B2, Types of Affiliation with the SAB.

The SAB Staff consists of 21 people: a Staff Director, a Deputy Staff Director, and the Team Leaders of the Committee Operations Staff

and the Committee Evaluation and Support Staff; six scientist/engineers who serve as Designated Federal Officers (DFOs), three administrative staff, five support staff, a National Older Worker's Career Center (NOWCC) Office Assistant and a student intern.

The Staff identifies potential issues for SAB attention, focuses questions for review by the Board, works with the Board to identify and enlist appropriate Members and Consultants, interfaces between the Board and the Agency as well as with the public, coordinates logistics for reviews, and produces minutes and reports for submission to the Administrator.

TABLE II FY 1998 SAB Committee Chairs

Executive Committee (EC)

Dr. Joan Daisey

Head, Center for Atmospheric and Biospheric Effects Technology, Lawrence Berkeley Laboratory
Member, American Chemical Society
Member, American Association for Aerosol Research
Member, Air Pollution Control Association
Member, International Society of Exposure Analysis
Member, Editorial Review Board Aerosol Science and Technology

Advisory Council on Clean Air Compliance Analysis (Council)

Dr. Maureen Cropper

Principal Economist, Policy Research Department, World Bank
Past President, Association of Environmental and Resource Economists
Member, Committee on the Status of Women in the Economics Profession
Member, Visiting Committee, Cornell Center for the Environment

Clean Air Scientific Advisory Committee (CASAC)

Dr. Joe Mauderly

Director of External Affairs, Lovelace Respiratory Research Institute
Member, American Thoracic Society
Member, Society of Toxicology
Member, American Physiological Society
Member, American Association for the Advancement of Sciences
Member, American Veterinary Medical Association
Member, Editorial Board of Experimental Lung Research
Member, Editorial Board of Inhalation Toxicology

Drinking Water Committee (DWC)

Dr. Richard Bull

Senior Staff Scientist, Pacific Northwest National Laboratory, managed by Battelle
Member, American Association for the Advancement of Science
Member, Sigma Xi
Member, American Society for Pharmacology and Experimental Therapeutics
Member, Society of Toxicology
Member, American Association for Cancer Research
Member, American Water Works Association
Member, International Society for the Study of Xenobiotics
Member, Editorial Board of Toxicology
Member, Editorial Board of the Journal of Toxicology and Environmental Health
Member, National Research Council Committee Spacecraft Maximum Contaminant Limits

TABLE II FY 1998 SAB Committee Chairs (Continued)

Member, Science Advisory Panel for Santa Anna River Water Quality and Health Study
Member, Bromide Expert Panel for the CAL-FED Program on the Sacramento River Delta

Environmental Economics Advisory Committee (EEAC)

Dr. Robert Stavins

Albert Pratt Professor of Business and Government, and Faculty Chair, Environment and Natural Resources Program, John F. Kennedy School of Government, Harvard University
University Fellow, Resources for the Future
Member, Board of Directors, Association of Environmental and Resource Economists
Member, Board of Academic Advisors, AEI-Brookings Joint Center for Regulatory Studies
Member, Editorial Council, *Journal of Environmental Economics and Management*
Member, Board of Editors, *Resource and Energy Economics*
Member, Advisory Board, *Environmental Economics Abstracts*
Member, Advisory Board, *Environmental Law and Policy Abstracts*
Member, Editorial Board, *Economic Issues*
Contributing Editor, *Environment*

Environmental Engineering Committee (EEC)

Dr. Hilary Inyang

University Professor and Director, Center for Environmental Engineering, Science, and Technology, University of Massachusetts, Lowell
DuPont Young Professor
National Research Council Young Investigator (1996)
Fellow, Geological Society of London
Member, American Society of Civil Engineers
Member, American Chemical Society, Associate Editor, *Journal of Environmental Engineering*, American Society of Civil Engineers; International Journal of Surface Mining and Reclamation
Editorial Board Member, Journal of Soil Contamination; Waste Management and Research; Environmental Monitoring and Assessments; Resources Conservation and Recycling

Ecological Processes and Effects Committee (EPEC)

Dr. Mark A. Harwell

Director, Center for Marine and Environmental Analyses, Rosensteil School of Marine and Atmospheric Science, University of Miami
Chair, U.S. Man and the Biosphere (MAB) Directorate on Human-Dominated Systems
Member, NAS-NRC Panel on Risk Characterization
Co-Editor, *Ecology Applications* special issue on ecosystems
Editor, *Climatic Change*, PAN-EARTH series on global climate change effects

Environmental Health Committee (EHC)

Dr. Emil Pfitzer

Fellow, Academy of Toxicological Sciences
Chairman of the Board, Toxicology Laboratory Accreditation Board
Member, Board of Directors, The Academy of Toxicological Sciences

TABLE II FY 1998 SAB Committee Chairs (Continued)

Distinguished Graduate Award, University of Pittsburgh
The Society of Toxicology's Arnold J. Lehman Award
Herbert E. Stokinger Award

Integrated Human Exposure Committee (IHEC)

Dr. Henry Anderson

Chief Medical Officer, Wisconsin Division of Public Health
Certified in Preventive Medicine, American Board of Preventative Medicine
Certified Specialist in Occupational and Environmental Medicine, American Board of Preventative Medicine
Fellow, American College of Epidemiology
Member, American Public Health Association
Member, American College of Epidemiology
Member, American Medical Association
Member, Council of State and Territorial Epidemiologists
Member, Editorial Board, Health and Environment Digest
Member, Editorial Board, Cancer Prevention International
Associate Editor, American Journal of Industrial Medicine
Co-Editor, Wisconsin Medical Journal of Industrial Medicine

Radiation Advisory Committee (RAC)

Dr. Stephen Brown

Director, Risks of Radiation and Chemical Compounds (R2C2)
Member, American Association for the Advancement of Science
Member, Chemical Health and Safety Section, American Chemical Society
Member, International Society of Exposure Analysis
Member, National Academy of Engineering/National Academy of Sciences
Member, Society for Risk Analysis (President, National Capital Area Chapter)

Research Strategies Advisory Committee (RSAC)

Dr. W. Randall Seeker

Senior Vice President, Energy and Environmental Research Corporation
Member, American Institute of Chemical Engineers
Member, American Society of Mechanical Engineers
Member, Combustion Institute

3.3 SAB Activities Section

3.3.1 Overview

The types of projects, as well as the range of subject matter, reviewed by the SAB continue to grow. The Board takes on reviews at the request of Congress, the Administrator, and EPA's various program offices, as well as on its own initiative. In general, the trend over time has been for more SAB reviews, addressing more varied subjects, requested by a wider range of individuals and organizations.

Historically, most of the outputs of the Board are in the form of full reports. Such reports present the findings of peer reviews of nearly-completed Agency projects and contain considerable detail about the findings and recommendations of the Board. They are generally structured as responses to the Charge to the Board. The Charge is a set of specific questions, negotiated by the Agency and the SAB that guide, but do not constrain, the review.

In recent years the SAB has worked with the Agency to produce quicker feedback and more timely advice that is focused at the front-end of the Agency's involvement with an issue. First, the "Consultation" is a means of conferring in public session with the Agency on a technical matter, before the Agency has begun substantive work on that issue. The goal is to leaven EPA's thinking by brainstorming a variety of approaches to the problem very early in the development process. There is no attempt or intent to express an SAB consensus or to generate a formal SAB position. The Board, via a brief letter, simply notifies the Administrator that a Consultation has taken place.

Second, the Board introduced the "Advisory" as a means of providing, via a formal SAB consensus report, critical input on technical issues during the Agency's position development process. In most instances, the topic of the Advisory will later be the subject of an SAB report, once the Agency has completed its work.

Third, the "Commentary" is a short communication that provides unsolicited SAB advice about a technical issue the Board feels should be drawn to the Administrator's attention.

Fourth, letter reports are similar in origin, content, and purpose to full reports. They are simply shorter; thereby generally resulting in more rapid advice to the Agency.

Tables III and IV display the SAB's operating expenses, staffing, meeting activity, and report production for the past five fiscal years (1994-1998). The increase in total costs over the years reflects an increase in the number of Board Members, a modest increase in the number of Staff, increases in Federal pay and allowances, and general increases in the cost of airline travel, hotel and meeting accommodations.

Table V details meeting activity and report preparation by Committee.

TABLE III SAB Expenses ($K) for Fiscal Years 1994-1998

Fiscal Year	Compensation Staff	M/C	Total	Travel	Other Expenses	TOTAL
1994	1100	564	1,664	373	106	2,143
1995	1186	650	1,836	358	166	2,360
1996	1045	392	1,437	242	88	1,768
1997	1170	555	1,725	282	212	2,219
1998[1]	1250	600	1,850	285	281	2,416

1 Estimated

TABLE IV SAB Activities and Staffing, Fiscal Years 1994-1998

	Committee Activities[a]				Committee Reports			Staffing	
	Public[b] Meet.	Public[c] Teleconf	Closed[d] Meet.	Total	Full[e]	Short[f]	Total[g]	Members	Federal Staff[h]
1994	58	15	1	74	15	15	30	100	16.0
1995	44	5[i]	1	50	27	13	40	98	17.0
1996	28	9	0	37	3	17	20	98	16.7
1997	34	21	1	56	11	18	29	97	17.6
1998	42	8	1	51	11	10	21	102	19.7

[a] Federal Advisory Committee Act (FACA) meetings announced in the *Federal Register*.
SAB staff and Members meet occasionally to prepare draft materials or to plan for public meetings. Such meetings are exempt from FACA requirements and are, therefore, not reflected in this table.
[b] Public meetings held face-to-face
[c] Public teleconference meetings
[d] Closed meetings, with approval of the EPA Administrator
[e] A full report on a topic is a more extensive discussion of the subject, e.g., greater than 10 pages.
[f] A short report is a more focused discussion of a topic. Included in this category are Letter Reports, Advisories, and Commentaries to the Administrator on issues of concern to the SAB.
[g] Appendix F contains a list of all FY97 reports and abstracts.
[h] Measured in Full Time Equivalents (One FTE equals one employee working one year)
[i] Includes one public hearing

TABLE V SAB Activities by Committee for Fiscal Years 1994-1998

Committee	Fiscal Year	Committee Activities[1]			Number of Reports[2]		
		Mtgs.	Teleconf.	Total	Full	Short	Total
EC	1994	5	0	5	0	0	0
	1995	6	2	8	1	2	3
	1996	3	2	5	1	2	3
	1997	3	3	6	0	4	4
	1998	3	5	8	0	0	0
EC/	1994	13	1	14	1	0	1
ad hoc	1995	4	1	5	4	0	4
Subcom.	1996	10	11	21	0	0	0
	1997	17	10	27	2	0	2
	1998	8	0	8	2	0	2
COUNCIL	1994	0	0	0	0	0	0
	1995	13	1	4	1	1	2
	1996	2	1	3	1	1	2
	1997	1	6	7	0	3	3
	1998	3	0	3	0	2	2
CASAC	1994	5	3	8	0	3	3
	1995	5	0	5	0	3	3
	1996	5	1	6	0	8	8
	1997	1	0	1	0	1	1
	1998	3	0	3	0	1	1
DWC	1994	5	0	5	2	2	4
	1995	3	0	3	2	2	4
	1996	2	1	3	0	2	2
	1997	1	1	2	1	1	2
	1998	2	0	2	0	1	1

TABLE V SAB Activities by Committee for Fiscal Years 1994-1998 (continued)

Committee	Fiscal Year	Committee Activities[1] Mtgs.	Teleconf.	Total	Number of Reports[2] Full	Short	Total
EPEC	1994	10	0	10	4	2	6
	1995	5	0	5	3	3	6
	1996	3	1	4	0	0	0
	1997	2	0	2	2	5	7
	1998	2	1	3	2	1	3
EEAC	1994	2	0	2	1	2	3
	1995	1	0	1	0	0	0
	1996	0	0	0	0	0	0
	1997	0	0	0	0	0	0
	1998	2	0	2	0	1	1
EEC	1994	5	3	8	1	2	3
	1995	7	0	7	6	1	7
	1996	2	1	3	1	0	1
	1997	3	0	3	3	1	4
	1998	6	0	6	4	1	5
EHC	1994	2	0	2	1	1	2
	1995	1	0	1	1	1	2
	1996	1	0	1	0	0	0
	1997	1	0	1	2	1	3
	1998	3	0	3	1	0	1
IHEC	1994	3	0	3	2	0	2
	1995	2	0	2	1	0	1
	1996	1	0	1	0	1	1
	1997	2	0	2	0	1	1
	1998	2	0	2	1	1	2

TABLE V SAB Activities by Committee for Fiscal Years 1994-1998 (Continued)

Committee	Fiscal Year	Committee Activities[1] Mtgs.	Teleconf.	Total	Number of Reports[2] Full	Short	Total
RAC	1994	7	6	13	1	1	2
	1995	5	1	6	4	0	4
	1996	2	4	6	0	2	2
	1997	4	1	5	1	0	1
	1998	6	2	8	0	1	1
RSAC	1994	3	2	5	2	1	3
	1995	3	0	3	1	1	2
	1996	0	2	2	0	1	1
	1997	0	0	0	0	0	0
	1998	3	0	3	1	1	2

EC	Executive Committee
COUNCIL	Advisory Council on Clean Air Compliance Analysis
CASAC	Clean Air Scientific Advisory Committee
DWC	Drinking Water Committee
EEAC	Environmental Economics Advisory Committee
EEC	Environmental Engineering Committee
EHC	Environmental Health Committee
EPEC	Environmental Processes Effects Committee
IHEC	Integrated Human Exposure Committee
RAC	Radiation Advisory Committee
RSAC	Research Strategies Advisory Committee

[1] Indicates meetings and public teleconferences requiring notice in the Federal Register.
[2] Reports are entered as Full Reports or Short Reports (which includes Letter Reports, Commentaries, and Advisories).

3.3.2 Reports That Meet SAB Criteria

In the face of more requests than current resources can address, the Board has had to be selective about its choice of projects. Increasingly, the SAB Staff has interacted formally with different parts of the Agency to determine EPA's priorities. For example, the majority of requests from the Agency now originate from an Assistant Administrator's office to help insure the request is a high priority. In addition, the SAB Staff has sought the advice and counsel of groups that cut across program offices in the Agency; e.g., the Science Policy Council.

Over the past decade, SAB priorities have generally been guided by a set of criteria that evolved from its 1989 "self-study" on the mission and functioning of the Board. At the 1997 Strategic Planning Retreat, the Executive Committee updated these criteria, which are listed below, together with examples of FY98 reports that reflect those criteria:

I – GENERAL CRITERION

A. Provides an opportunity to make a difference in the Agency's operations

1. Although a final report has not yet been released, the SAB's Integrated Risk Project (IRP) continues to command a significant portion of the SAB's efforts. This project, initiated at the request of the Administrator, addresses at a fundamental level, the whole approach taken to environmental protection.

2. EPA-SAB-RSAC-COM-98-002 Commentary on the Process for SAB Review of the ORD Presidential Budget Request

Following its report on the review of the ORD Budget, the RSAC provided a list of specific recommendations that will help future budget presentations to the Board and to Congress.

II – CLIENT-RELATED CRITERIA

A. Supports major regulatory or risk management initiatives.

EPA-SAB-EEC-98-007, Review of the OPPT's Toxics Release Inventory(TRI) Relative Risk-Based Environmental Indicators Methodology

The SAB reviewed an innovative use of the TRI database that provides a broad-spectrum tool for identifying candidate problem areas in the environment.

B. Serves leadership interests such as those of the EPA Administrator or Congress.

EPA-SAB-EHC-98-001, SAB's Review of the EPA Draft Mercury Study Report to Congress

Congress directed the Agency to prepare a report on the health risks associated with mercury in the environment. The SAB critically reviewed the report and provided input to a cross-government group convened to help resolve differing interpretations of the science between EPA and sister Federal agencies.

C. Supports strategic themes of current interest.

EPA-SAB-EEAC-ADV-98-005, An SAB Advisory on Economic Research Topics and Priorities

In FY98, the EEAC was re-activated and began immediately to provide advice on the Agency's use and direction of its emerging contingent of economic talent. This Advisory is meant to provide specific suggestions for research areas in environmental economics that need particular attention.

III – SCIENCE-DRIVEN CRITERIA

A. Involves scientific approaches that are new to the Agency.

EPA-SAB-EEC-98-007, Review of OPPT's Toxic Release Inventory (TRI) Relative Risk-Based Environmental Indicators Methodology

The SAB reviewed an innovative approach to screening the relative impacts of emissions of complex mixtures from Toxics Release Inventory facilities around the country. The effect is to change raw mass emission rates of various substances into a crude first-tier estimate of associated relative risks from those emissions.

B. Deals with areas of substantial uncertainties.

Although still in draft form at the end of FY98, the RAC's review on uncertainty in radiation risk analysis reflects vigorous discussion of the topic in the Committee. Many of the concepts are

relevant to uncertainty consideration in areas besides radiation.

V -- PROBLEM-DRIVEN CRITERIA

A. Involves major environmental risks.

1. EPA-SAB-COUNCIL-ADV-98-002, Advisory by the Air Quality Models Subcommittee (AQMS) on the Air Quality Models and Emissions Estimates Initial Studies

2. EPA-SAB-COUNCIL-ADV-98-003, Advisory on the Clean Air Act Amendments (CAAA) of 1990 Section 812 Prospective Study: Overview of Air Quality and Emissions Estimates Modeling, Health, and Ecological Valuation Issues: Initial Studies

These reports address a major environmental issue/policy problem that mesh scientific and economic considerations; that is, the costs and benefits projected to be derived from implementation of the 1990 Clean Air Act.

B. Relates to emerging environmental issues.

EPA-SAB-EC-98-013, Review of the USEPA's Report to Congress on Residual Risk

The SAB reviewed the Agency's strategy for addressing one of the major aspects of environmental protection; i.e., the risks that will remain once the Maximum Achievable Control Technology (MACT) standards have been implemented for the major air pollution sources in the country.

C. Exhibits a long-term outlook.

EPA-SAB-EEC-LTR-98-003, Review of the Agency-wide Quality Management Program

The SAB is conducting a multi-meeting examination of the quality management program at the Agency. In addition to the merit of the program *per se* (the subject of this report), the Board will also examine the barriers to implementation of a quality program.

V -- ORGANIZATIONAL-RELATED CRITERIA

A. Serves as a model for future Agency methods.

EPA-SAB-IHEC-98-004, Review of the Source Ranking Database

The SAB reviewed this prototypic effort to combine toxicity information from related sources. The method contributed to other Agency efforts, such as the TRI Indicators project; see III.A above.

B. Requires the commitment of substantial resources to scientific or technological development.

EPA-SAB-RSAC-98-006. Review of the FY99 President Budget Request for the Office of Research and Development

The SAB complimented the Agency on the finest presentation of its budget to date, while identifying several areas in the roughly $500 million budget that needed buttressing.

C. Transcends organizational boundaries, within or outside EPA. (Includes international boundaries.)

EPA-SAB-EPEC-98-003, Ecological Impacts and Evaluation Criteria for the Use of Structures in Marsh Management

The use of manmade structures to modify wetland marshes has been controversial in a number of locations across the country. The SAB has generated a comprehensive report that lays out broadly applicable principles that should assist organizations at various governmental levels as they confront this challenging ecological issue

D. Strengthens the Agency's basic capabilities.

EPA-SAB-RSAC-COM-98-002, Commentary on the Process for SAB Review of the ORD Presidential Budget Request

While the Board applauded what they felt was the best presentation of the ORD budget they had ever seen, they also made specific recommendations for making the Agency's case more effectively. The clarity of the presentation of the Budget has a big impact on the support it receives from the Board and ultimately from the Congress.

3.3.3 Responses and Reactions to SAB Activities

Since 1984, the Board has formally requested written Agency responses to SAB reviews. The majority of the responses indicate that the Agency has acted positively on the advice given by the Board. In many instances, the Agency has initiated action on the basis of the advice rendered at the public meetings, prior to their actual receipt (via the Administrator) of the formal report from the Board. In some other cases, the Agency and the Board "agree to disagree."

Support for the SAB both inside and outside the Agency remains strong. The Deputy Administrator has made it a practice to attend regularly Executive Committee meetings to discuss topics of mutual interest. Several Assistant Administrators also made presentations and requests at meetings of the Executive Committee in FY98. The large number of EPA requests for SAB assistance speaks to the Agency's commitment to the SAB. However, resource constraints continue to limit the extent to which the Board can respond fully to the needs of the Agency.

4. REVIEW OF FY98 ACTIVITIES

4.1 Introduction

EPA and environmental decision making in general have undergone rapid change in recent years, providing new opportunities for the SAB to enhance the quality of science in environmental decision making, or, in some cases, requiring that the SAB also change in order to continue being successful. The changes in EPA and environmental decision making which are particularly relevant to the SAB's mission include new, less-centralized decisionmaking approaches, emerging scientific issues, crosscutting initiatives and programs, multiple avenues for peer review, an expanded EPA grants program, and international dimensions of emerging environmental problems.

During this transition from its traditional command-and-control approach to the more placed-based, pollution prevention operation of the future, the Agency's approaches to environmental protection are changing, and to be most effective the SAB needs to change with them. Specifically, the SAB needs to spend much more of its total energies on providing strategic, forward-looking advice, while maintaining and even improving the quality, utility, and timeliness of its peer review of EPA products.

In November 1997, the Executive Committee held its first retreat to develop a strategic plan to meet this challenge. In the minds of the members of the Executive Committee, the overarching goal of the Board is to make a positive difference in the way that the science underlying decisions is commissioned, developed, and used in environmental decision-making. The product of the retreat was a Strategic Plan (EPA-SAB-98-010). The EC felt a need to make a transition in the way the Board does business and recommended that changes be made along several lines simultaneously:

a) Improve general operations by improving timeliness, by accepting the right projects for peer review, and improving communication with customers, other organizations and with new SAB members and Chairs.

b) Redirect, develop, or modify some specific SAB elements, including directing the Research Strategies Advisory Committee to focus on the broad strategic aspects of research and science in the Agency and integrating economics expertise into the broader work of the Board.

c) Launch new initiatives to meet the challenge of the Agency's own changes in environmental decisionmaking, such as selecting a few strategic projects each year that focus on broad issues such as the role of science in "next generation" approaches to environmental protection; develop or contribute to the development of workshops to address important, under-recognized scientific issues; explore a broader range of social science involvement in SAB activities; experiment with short summaries of its reports for non-technical audiences; and consider a focus on international environmental issues.

In FY98, the Board began the transition, guided by its Strategic Plan. As an example, the EC held several conference calls to expedite report approval to make the Board's advice more timely and useful to the Agency. It maintained its close contacts with the FIFRA Scientific Advisory Panel and the ORD Board of Scientific Counselors and began efforts to coordinate more closely with science advisory boards of other nations.

As part of the Board's efforts to integrate more social science into its activities the EEAC was reinvigorated and worked closely with the Deputy Administrator Fred Hansen and Agency economists to update its mission and review the Agency's guidelines for economic analyses.

As a part of its rejuvenations the EEAC invited Dr. Jeffrey Frankel of the President's Council of Economic Advisors to one of its meetings to discuss various environmental issues.

The IHEC worked with a new Agency client office when it reviewed the questions guiding the Office of Civil Rights in their

evaluation of whether there are disproportionate exposures of environmental toxicants to various sub-populations.

A final SAB transition this year was the RSAC's exploration of ways that it might provide advice and recommendations on the Agency's overall science and technology budget, not just on the ORD budget, as the Agency finds better ways to use its resources more wisely and to implement the requirements of the Government Performance for Results Act.

4.2 Overview of SAB Activities

The subsections below contain highlights of the activities of each of the SAB Committees, as well as a listing of the Members for each of the Committees for FY98. Clearly, not all of the activities of the Committees can be captured in this way, but the descriptions will give the reader a broad view of what has been going on, including basic statistical information about the number of meetings and reports for each group.

4.2.1 Executive Committee (EC)

EC Members

Joan Daisey, Chair
Granger Morgan
Henry Anderson
Steve Brown
Richard Bull
Maureen Cropper
Mark Harwell
Hilary Inyang
Morton Lippmann
Alan Maki
Genevieve Matanoski, Past Chair
Joe Mauderly
M. Granger Morgan
Emil Pfitzer
W. Randall Seeker
Ellen Silbergeld
Robert Stavins
Terry Young

LIAISON
Costel Denson, BOSC Chair
Ernest McConnell, SAP Chair

The EC conducted eight public meetings in FY98, five of them by conference call. Five EC subcommittees each held public meetings during the year. Also, the EC conducted its first Strategic Planning Retreat in November, 1997.

The Subcommittee activity arose, in part, from decisions made at the Retreat that the SAB should be more involved in strategic, broad-based activities that draw on input and participants from many Committees of the Board; cf., a "matrix-management" approach. As a result, EC Subcommittees were formed to deal with the following issues:

a) Computer Models – Dr. Ishwar Murarka, Chair; Jack Fowle, DFO

b) D-CORMIX Model – Dr. Ishwar Murarka, Chair; Bob Flaak, DFO

c) Residual Risk Report to Congress – Dr. Philip Hopke, Chair; Don Barnes, DFO

d) Scientific and Technological Achievement Awards – Dr. C. Herbert Ward, Chair; Bob Flaak, DFO

e) Secondary Uses of Data – Dr. Morton Lippmann, Chair; Anne Barton, DFO

f) Strategic Ranking Criteria – Dr. W. Randall Seeker, Chair; Stephanie Sanzone, DFO

The emphasis on computer models actually stems from a 1989 SAB Commentary that urged the Agency to be more systematic in its approach to the development, testing, and utilization of computer models in environmental protection. In 1995 the SAB again urged the Agency to follow through on its announced plans in this regard. In response, in December, 1998 the Agency hosted a "Models 2000" conference to which the SAB (Dr. Murarka) was invited to lay out the Board's concerns. As a result, the Agency established a cross-EPA Steering Committee to coordinate the efforts of 10 workgroups to deal with different aspects of modeling. The SAB's Models Subcommittee was established to provide a public source of technical advice and critical review on this issue. The D-CORMIX Subcommittee was already in place to review a specific computer model.

The Residual Risk Subcommittee was formed to help meet a near-term Agency deadline to develop a strategy for dealing with risks that remain after Maximum Achievable Control Technology (MACT) is put in place on various air pollution sources. The EC Subcommittee approach was used because a) the subject matter

was interdisciplinary and b) it held the promise of a more timely review. The charge was drafted in May; the Subcommittee was recruited in June-July; the meeting was held in August; and the 100 page report was completed in September.

The Scientific and Technological Achievement Awards focus continued a decade-long role of the Board in reviewing peer-reviewed publications by EPA scientists and recommending them for awards from the Office of Research and Development.

The EC identified Secondary Uses of Data as a strategic issue in the spring. This interest coincided with the desire of the Center for Environmental Information and Statistics (CEIS) in the Office of Policy Analysis (OPA) for on-going technical advice.

A sixth ad hoc subcommittee of the EC, the Strategic Ranking Criteria Subcommittee, was formed to offer advice to the Agency's Office of the Chief Financial Officer (OCFO) on ways in which the IRP project thinking could be applied to strategic planning and budgeting. The Subcommittee conducted a consultation with OCFO staff on possible revisions to the comparative criteria that the Agency program offices use to evaluate their programs in the context of the Government Performance and Results Act (GPRA) strategic plan which contains specific goals, objectives, and subobjectives. Subcommittee members provided suggestions on improvements to the comparative risk analysis that is applied to the subobjectives and encouraged the Agency to continue work to develop economic and cost comparative criteria as well.

In addition to the six new subcommittees, work continued on the Integrated Risk Project (IRP), an EC project, under the direction of Dr. Genevieve Matanoski with DFO assistance from Tom Miller and Stephanie Sanzone. The Steering Committee produced a penultimate draft of an Overview report, destined for wide distribution, and compiled the work of five subcommittees into an Exposition on Integrated Environmental Decisionmaking that expands upon the major themes of the report. Both the Overview and the Exposition will be subjected to peer review in FY99.

In FY98, EC used 39 Consultants.

The EC issued two reports in FY98:

a) SAB Award Recommendations for the 1997 Scientific and Technological Achievement Awards (STAA) Nominations
EPA-SAB-EC-98-012

b) Review of U.S. EPA's Report to Congress on Residual Risk
EPA-SAB-EC-98-013

4.2.2 Advisory Council on Clean Air Compliance Analysis (COUNCIL)

COUNCIL Members

Maureen Cropper, Chair	**Jane V. Hall**
Ronald Cummings	**Paul Lioy**
Daniel Dudek	**Paulette Middleton**
A. Myrick Freeman	**Richard Schmalensee**
Lawrence H. Goulder	**Thomas Tietenberg**

The Advisory Council on Clean Air Compliance Analysis (Council) was mandated by Congress in the 1990 Clean Air Act (CAA) Amendments. Its mission is to review Agency documents dealing with the costs and benefits of the CAA and with the implementation of the CAA regulations. The Council's Air Quality Models Subcommittee (AQMS) reviews air quality models and emissions estimates while the Health and Ecological Effects Subcommittee (HEES, formally the Physical Effects Review Subcommittee, PERS) reviews associated health and ecological issues.

During FY1998, the Council provided an advisory review of initial studies leading to the first Section 812 Prospective Study Report to Congress.

In FY 98, COUNCIL used 12 Consultants.

The Council and its two subcommittees conducted a total of three meetings in FY 98 and issued two advisories,

a) An SAB Advisory: The Clean Air Act (CAA) Section 812 Prospective Study of Costs and Benefits - Air Quality Models and Emissions Estimates Initial Studies by the Advisory Council on Clean Air Compliance Analysis (AQMS product)
EPA-SAB-COUNCIL-ADV-98-002

b)An SAB Advisory on the Clean Air Act Amendments (CAAA) of 1990 Section 812 Prospective Study: Overview of Air Quality and Emissions Estimates Modeling, Health and Ecological Valuation Issues Initial Studies EPA-SAB-COUNCIL-ADV-98-003

4.2.3 Clean Air Scientific Advisory Committee (CASAC)

CASAC Members

Joe Mauderly, Chair	**John Elston**
Philip Hopke	**Jay Jacobson**
Arthur Upton	**Sverre Vedal**
Warren White	

The Clean Air Scientific Advisory Committee (CASAC) held three meetings during FY98. Two of these meetings concerned planning for the upcoming (FY99 and later) review cycles of several national ambient air quality standards (NAAQS): a) review of the development plan for the particulate matter (PM) NAAQS; and b) review of the development plan for the carbon monoxide (CO) NAAQS. The third meeting concerned the Committee's second peer review (done previously in 1995) of the Agency's draft Diesel Health Assessment Document.

In FY 98, CASAC used eight Consultants.

The Committee issued one letter report in FY98:

a) CASAC Review of the Project Work Plan for the Particulate Matter Criteria Document EPA-SAB-CASAC-LTR-98-002

4.2.4 Drinking Water Committee (DWC)

DWC Members

Richard Bull, Chair	**L.D. McMullen**
Judy Bean	**Charles O'Melia**
Lenore Clesceri	**Edo Pellizzari**
Yvonne Dragan	**Gary Toranzos**
John Evans	**Rhodes Trussell**
Anna Fan-Cheuk	**Marylynn Yates**

The Committee met two times in FY98 to receive briefings on a number of issues that are important to the implementation of the Safe Drinking Water Act Ammendments of 1996. Topics included the EPA Microbial/Disinfection Byproduct Research Plan, a Notice of Data Availability relevant to a number of pending drinking water regulations, an assessment of the carcinogenicity study on chloroform and dichloroacetate which was conducted by the International Life Sciences Institute, the draft Drinking Water Candidate Contaminant List, and the Agency's Science to Achieve Results (STAR) grants-based research program. The DWC also conducted Consultations with the Agency on alternative test systems for the evaluation of disinfection byproduct mixtures and a method for estimating drinking water intake levels. The Committee conducted advisory reviews on the National Contaminant Occurrence Database and the national-level affordability criteria for technologies for small drinking water systems.

In FY98, DWC used five consultants.

The Committee issued one advisory and two notifications of consultation during FY98:

a) Notification of a Consultation on Alternative Test Systems for the Evaluation of Disinfection By-product Mixtures EPA-SAB-DWC-CON-98-004

b)Notification of a Consultation on a Method for Estimating Drinking Water Intake Levels
EPA-SAB-DWC-CON-98-005

c) An SAB Advisory on the National Drinking Water Contaminant Occurrence Database
EPA-SAB-DWC-ADV-004

4.2.5 Ecological Processes and Effects Committee (EPEC)

EPEC Members

Mark Harwell, Chair	**Kenneth Cummins**
Alan Maki, Vice Chair	**Carol Johnston**
Miguel Acevedo	**Judith McDowell**
William Adams	**Frieda Taub**
Lisa Alvarez-Cohen	**William Smith**
Steven Bartell	**Terry Young**

The Ecological Processes and Effects Committee (EPEC) is the primary committee responsible for reviews and advice relating to ecological issues, including environmental monitoring and assessment, ecological risk assessment, and ecological criteria. Traditionally, the committee has sought to expand the Agency's attention to include non-chemical stressors (e.g., habitat issues, physical alteration of ecosystems, and introduced species) and to raise the visibility of ecological risks.

EPEC held three meetings in FY98. Special mention is made of the first meeting in which the Committee met in Boston to review a regional initiative for the Blackstone River. The review of the Blackstone River Initiative offered an unusual opportunity for Committee members to learn about an on-the-ground effort to model and monitor a watershed, led by EPA Region I with participation by the states of Massachusetts and Rhode Island, and cooperation from several federal agencies, municipalities, and private businesses. The meeting also marked the first time that Region I had engaged in an SAB review.

Other key activities of EPEC during FY98 included: development of a strategic project to propose a conceptual framework for a report card on ecological health and consultations with the Agency on the use of Toxicity Equivalency Factors (TEFs) in ecological risk assessment and future guidance on ecological risk assessment.

During FY98, the Committee released its state-of-the-science report on the use of structures to alter hydrology in coastal marshes (EPA-SAB-EPEC-98-003). The marsh management report was a scientific report generated by a special subcommittee of EPEC over a several-year period. In keeping with the SAB Executive Committee's decision to print and widely distribute some reports with broad appeal, the report on marsh management was printed in color with photographs and distributed to interested federal, state, and non-governmental wetland and living resource managers and scientists.

In FY98, EPEC used five consultants.

The EPEC issued two full reports and one letter report during FY 98:

a) Ecological Impacts and Evaluation Criteria for the Use of Structures in Marsh Management
EPA-SAB-EPEC-98-003

b) Evaluation of the Blackstone River Initiative
EPA-SAB-EPEC-98-011

c) Review of the EPA's Draft Ecological Research Strategy
EPA-SAB-EPEC-LTR- 98-001

4.2.6 Environmental Economics Advisory Committee (EEAC)

EEAC Members

Robert Stavins, Chair	**Dale Jorgenson**
Nancy Bockstael	**Catherine Kling**
Trudy Cameron	**Charles Kolstad**
Maureen Cropper	**Robert Repetto**
Herman Daly	**Richard Schmalensee**
A. Myrick Freeman	**W. Kip Viscusi**

In FY98, the Environmental Economics Advisory Committee (EEAC) met two times. At its first meeting the EEAC discussed the Committee's mission with the Deputy Administrator and received briefings on the Agency's plans to revise the existing guidelines for the conduct of economic

analyses, an EPA-sponsored Resources for the Future study on the cost of environmental regulation, and the Agency's efforts to prepare an economics research plan. At its second meeting, the EEAC members completed an Advisory on a series of economics research topics. The Committee also began a review of the Agency's initial efforts to revise their economic analysis guidelines and they discussed a number of environmental economic issues with Dr. Jeffrey Frankel of the President's Council of Economic Advisors.

In FY98, EEAC used one consultant.

The Committee issued one Advisory during FY98:

a) An SAB Advisory on Economic Research Topics and Priorities EPA-SAB-EEAC-ADV-98-005

4.2.7 Environmental Engineering Committee (EEC)

EEC Members

Hilary Inyang, Chair	**James Johnson**
Edgar Berkey	**JoAnn Lighty**
Calvin Chien	**John Maney**
Terry Foecke	**Ishwar Murarka**
Nina French	**Lynne Preslo**

The full EEC met twice in FY98. There were four Subcommittee meetings as well. The meetings addressed a range of issues including: the Agency-wide Quality Management Program, attributes for successful proactive technical advice, and potential initiatives. In response to the Executive Committee's Strategic Retreat, the EEC developed criteria for selecting among potential initiatives, applied them, and assigned the following topics to members for further development: (1) Measures of Environmental Technology Performance; (2) TCLP: From Waste Classification to Source Term Prediction; (3) Natural Hazards: A Framework for Control of Environmental Impacts; (4) Waste Utilization; (5) P2: Barriers to Implementation and Social Science; and (6) Potential Sources of PM 2.5. The members are drafting commentaries which include background information, a discussion of criticality and risks associated with inaction, identification of approahces that EPA could take, and specific recommendations.

In FY98, EEC used ten consultants.

The EEC issued four reports and one letter report during the year:

a) Review of the Waste Research Strategy of the Office of Research and Development EPA-SAB-EEC-98-005

b) An SAB Review: Review of the Toxics Release Inventory Relative Risk-Based Environmental Indicators Methodology EPA-SAB-EEC-98-007

c) An SAB Report: Review of ORD's Pollution Prevention Research Strategy EPA-SAB-EEC-98-008

d) An SAB Report: Review of the Office of Solid Waste's Proposed Surface Impoundment Study EPA-SAB-EEC-98-009

e) Science Advisory Board Review of the Agency-Wide Quality Management Program EPA-SAB-EEC-LTR-98-003

4.2.8 Environmental Health Committee (EHC)

EHC Members

Emil Pfitzer, Chair	**Abby Li**
Cynthia Bearer	**Michele Medinsky**
Adolfo Correa	**Frederica Perera**
John Doull	**Mark Utell, Co-Chair**
David Hoel	**Lauren Zeise**

The Environmental Health Committee (EHC) shares responsibilities for health effects reviews with several committees of the Board (DWC, IHEC, RAC, and CASAC). The principal focus for EHC has been issues related to development and use of guidelines for health risk assessments. The EHC has continued to maintain a close relationship with the other SAB health-related Committees, and with the Scientific Advisory Panel (SAP) of the Office of Pesticides, often

holding joint meetings and sharing members for reviews.

The EHC met three times in FY98. At the first meeting, the EHC reviewed the Office of Research and Development's (ORD) proposals on calculating acute reference doses, and they discussed a series of case studies demonstrating application of various methodologies to chosen toxicants. At the second meeting they reviewed the ORD's draft health risk assessment document on 1,3 Butadiene. At the third meeting they reviewed the Office of Pollution Prevention and Toxics' proposed "403 Lead Rule."

The 1,3 Butadiene review focused on the overall technical quality of the document; its degree of support for the classification of 1,3 Butadiene as a "known" human carcinogen;" the approaches taken to characterize plausible cancer risks; and support for the conclusions and quantitative estimations concerning reproductive and developmental effects.

The RfC review addressed approaches for deriving Acute Reference Values (ARE); dosimetric adjustments to the ARE; the use of an expert system for categorizing severity; the guidance offered for including lethal and severe effect data in the ARE calculation; the use of categorical regression; and the use of duration adjustments in ARE derivation.

The lead review arose from the requirements contained in the Residential Lead-Based Paint Hazard Reduction Act of 1992 (42 U.S.C. 4851) which amended the TSCA. The EHC was charged to determine if the *Risk Analysis to Support Standards for Lead in Paint, Dust, and Soils, (Volumes I and II)* were technically sound, appropriate, and scientifically defensible.

In FY98, EHC used twelve consultants.

The EHC issued one report based on a meeting in FY97.

a) Review of the EPA Draft Mercury Study Report to Congress
EPA-SAB-EHC-98-001

4.2.9 Integrated Human Exposure Committee (IHEC)

IHEC Members

Henry Anderson, Chair	**Thomas McKone**
Joan Daisey, Past Chair	**Maria Morandi**
Paul Bailey	**Jerome Nriagu**
Robert Harley	**Barbara Petersen**
Michael Lebowitz	**Charles Weschler**
Kai-Shen Liu	**Ronald White**

The IHEC addresses many of the exposure assessment issues that come before the Board. In FY96, the Committee's name was changed from the Indoor Air Quality/Total Human Exposure Committee (IAQC) to reflect more accurately the issues with which the Committee typically dealt.

The Commitee met twice during FY98, At its first meering IHEC reviewed the Office of Civil Rights documents "Questions for the Science Advisory Board on the Title VI Relative Burdent Analyses "and the" Cumulative Outdoor Air Toxics Concentration and Exposure Methodology" addressing the possible disparities in exposure to environmental toxicants across various sub-populations. At its second meeting, the Committee reviewed the Office of Research and Development's National Human Exposure Assessment Survey (NHEXAS) and the National Health and Human Nutrition Examination Survey (NHANES).

The focus of the relative burden meeting was the reviw of underpinnings of the Basic Relative Burden Analysis Methodology (BRBA), the Enhanced Relative Burden Analysis Methodology (ERBA), and the Cumulative Outdoor Toxics Concentration and Exposure Methodology (COATCEM) for scientific merit.

The purpose of the NHEXAS/NHANES meeting was to develop a report on the NHEXAS program, and to receive a briefing on the NHANES. The basic Charge addressed the strengths and weaknesses of multimedia, multipathway measurements of exposure; the adequacy of ongoing and planned analyses; how

to increase the utility of the information from NHEXAS; identifying follow-up studies; how to strenghthen the immediate and long-term utility of NHEXAS and studies like it.

In FY98, the IHEC used eight consultants.

The IHEC issued one report and one Commentary in FY98:

a) Review of the Office of Pollution Prevention and Toxics Source Ranking Database
EPA-SAB-IHEC-98-004

b) Commentary on the OAR's Draft Indoor Air Strategy
EPA-SAB-IHEC-COM-98-001

4.2.10 Radiation Advisory Committee (RAC)

RAC Members

Stephen Brown, Chair	**Janet Johnson**
William Bair	**Ellen Mangione**
June Fabryka-Martin	**Paul Merges**
Thomas Gesell	**John W. Poston,Sr.**
F. Owen Hoffman	**Genevieve S. Roessler**
Bernd Kahn	**James Watson, Jr.**

The Radiation Advisory Committee (RAC) is most closely aligned with the Office of Radiation and Indoor Air (ORIA), although the Office of Water, and the National Center for Environmental Assessment (NCEA), within the Office of Research and Development (ORD) are also clients.

In FY98, the RAC and its subcommittees held eight public meetings. Two were public teleconferences. The committee addressed three major topics: a) review of uncertainty in radiogenic cancer risk, b) review of Federal Guidance Report Number 13 - Part 1, which provides for estimation of health risks to the public from low-level environmental exposure to radionuclides, and c) a second advisory on the Environmental Radiation Ambient Monitoring System (ERAMS II), which reconfigures this system for the future.

In FY98, RAC used six consultants.

In FY 1998, the RAC issued one advisory and one notice of consultation:

a) Radiation Advisory Committee Advisory on Environmental Radiation Ambient Monitoring System (ERAMS)
EPA-SAB-RAC-ADV-98-001

b) Radiation Advisory Committee Notification of a Consultation on Alternative Approaches for Disposal of Federal Low-Activity Radioactive Wastes
EPA-SAB-RAC-CON-98-001

4.2.11 Research Strategies Advisory Committee (RSAC)

RSAC Members

W. Randall Seeker, Chair	**William Adams**
Stephen Brown	**Theodora Colborn**
Edwin Cooper	**Charles Gerba**
Philip Hopke	**Paulette Middleton**
Ishwar Murarka	**William Smith**

The Research Strategies Advisory Committee (RSAC) held three meetings during FY98. The first meeting was conducted to outline the process for the Office of Research and Development (ORD) budget and to prepare the Committee for the actual budget review to be held later in the year. The second meeting was the Committee's annual review of the Presidential Budget Request for ORD. Following this review, two members of the Committee testified at the House of Representatives budget hearings. The third meeting was held at the suggestion of Deputy Administrator Fred Hansen to examine how the Committee could provide advice and recommendation to the Agency on its overall science and technology budget.

In FY98, RSAC did not use any consultants.

The Committee issued one report, one commentary, and one notice of consultation during FY98:

a) An SAB Report: Review of the FY1999 Presidential Budget Request for the Office of Research and Development
EPA-SAB-RSAC-98-006

b) Commentary on the Process for Science Advisory Board Review of the ORD Presidential Budget Request
EPA-SAB-RSAC-COM-98-002

c) Notification of a Consultation on the Agency's FY2000 Science and Technology (S&T) Budget
EPA-SAB-RSAC-CON-98-006

4.3 Examples of Transitions

4.3.1 SAB Strategic Planning Retreat

During the November, 1997 Strategic Planning Retreat (SPR) the Executive Committee made major decisions about the future direction of the Board. These decisions are captured in the SAB Strategic Plan (EPA-SAB-98-010) that outlines the changes the Board needs to make in order to continue making a positive difference in the production and use of science at EPA. The major objectives for the next few years are:

a. Maintain and improve the quality of peer review done by the Board

This includes improving timeliness, improving communication of SAB findings and results (see "Synopsis", below), better selection of projects for peer review, and a new liaison function for EC members to maintain effective contact with the needs of EPA program offices.

b. Provide more strategic advice

Both the Executive Committee and most of the Standing Committees have initiated strategic projects, usually self-initiated, to provide useful front-end advice to the Agency on key issues. Although the strategic projects inspired by the SPR have not yet been completed, many have been started and were discussed at public meetings this year.

c. Explore science activities in new EPA initiatives

The SPR included a great deal of lively discussion about EPA's reinvention activities, such as Community-Based Environmental Protection and the Common Sense Initiative as well as the need for new SAB approaches to meet the needs of these new programs. In April, the Executive Committee received a briefing from a group of EPA officials involved in these new approaches. As a result, the Executive Committee is planning a workshop on the the role of science in the new initiatives, to be held early in FY99.

4.3.2 Evidence in SAB Products

a. "Gussied-Up" Report

Some SAB reports provide advice that is specifically tailored to a particular problem facing the Agency. Interest in those reports is generally confined to the Agency itself. However, many SAB reports address issues that transcend the Agency. In such cases the Board's advice has applications beyond EPA, *per se*. Too often, however, news about such SAB reports has not traveled very far.

In FY98 the Ecological Processes and Effects Committee completed work on an extensive study of man-made structures as a means of managing marshes. Although the focus of the study was activity along the Gulf coast -- to which the SAB made a field trip to examine some of these structures -- there are numerous sites along the Atlantic, Pacific, and Great Lakes coasts where such advice is applicable.

Therefore, the SAB prepared a special layout and production for its report: "Ecological Impacts and Evaluation Criteria for the Use of Structures in Marsh Management" (EPA-SAB-EPEC-98-003). The spine-stapled volume contains half a dozen photographs, several of them taken during the field trip itself, to illustrate the principles that the Committee was espousing. Based upon the large number of attendees at public meetings and known interested parties throughout the country, hundreds of copies were printed and distributed in an initial mailout across the country.

The intention is to prepare similar special productions of Committee reports in the future that contain advice that should be broadly known and applied within and beyond the Agency.

b. Synopses

While SAB reports are available upon request through the Staff Office and/or via downloading from the SAB Website, often times interested readers are unaware that the Board

has generated a report on a particular topic. Efforts to "spread the word" include mention of each new report in the SAB newsletter ("HAPPENINGS at the SAB") at the time of the report's publication, along with reproduction of the Abstract from the report.

In an effort to extend that reach further, in FY98, the SAB experimented with generating "An SAB Synopsis" for some of its reports that were thought to be of broad interest. Each SAB Synopsis is a one-page summary that gives a non-technical summary of the SAB's findings in a particular report and directs the reader to the Staff Office and/or the SAB Website for more information. It is essentially a "flyer", designed to notify and inform potential readers of the full report.

The SAB Synopses were generated and distributed in FY98 in connection with the three following reports:

(1) ORD Budget
(2) Residual Risk Report to Congress
(3) Diesel Health Criteria Document

4.3.3 Improved Timeliness

In recent years it has become evident that, in general, the length of time it takes to generate and transmit an SAB report to the Agency is inversely proportional to the impact of that advice. While most SAB reports are delivered to the Administrator within 4-6 months following the last public meeting on the topic, some reports have taken much longer. Again, while there are understandable reasons for this delay, the result is that a program offices loses the benefit of the advice on that project and is more reluctant to bring the next important project to the SAB out of concern for encountering similar delays. In FY98, this concern was voiced by program offices during the Strategic Planning Retreat (SPR) and by the Deputy Administrator at a meeting of the SAB Executive Committee.

In response, the Executive Committee (EC) made attention to timeliness one of the major commitments coming out of the SPR. The participants adopted a number of initiatives designed to improve on their record. They agreed to the following:

a) A typical report should be completed within 2-4 months after a public meeting.

b) A working draft of reports should be generated prior to adjournment of public meetings.

c) In some cases, it should be possible to transmit a report in less than two months.

d) In fewer cases, it should be possible to transmit a report in less than a month. [For these cases, it may be necessary to delegated authority to a fewer members of the EC to approve the report on behalf of the whole body.]

e) The use of "matrix-managed "subcommittees of the EC, involving expertise from a number of different committees eliminates the review of a report at a Committee level prior to review by the EC. [A number of such EC subcommittees were established following the SPR.]

f) Publicly-accessible telephone conference calls should be convened between quarterly face-to-face meetings of the EC in order to take action on Committee reports.

Three examples will illustrate that a "change of pace" has taken place:

a) In the late spring the Agency decided that its Report to Congress on Residual Risk should receive high-level peer review prior to transmittal to the Hill. SAB Staff worked with the Agency to generate a Charge. The Panel was recruited, meeting arrangements were in place, and the Federal Register notice was published within a month. Panel Members came to the meeting with written answers to the Charge questions, At the end of the one-day meeting, the Chair summarized the major points that would be made in the report. Four days later draft minutes were distributed. Within three weeks a 120-page draft report was available to the public, Agency, and the EC. The EC approved the report, with modest edits, at the end of sixth week. The final report was sent to the Administrator and posted on the SAB Website by the end of the eighth week after the meeting.

b) Each year the Office of Research and Development asks the SAB to review articles published in peer- reviewed technical journals by EPA scientists and to identify authors whom they would recommend for awards. In FY98 the Scientific and Technological Achievement Awards Subcommittee of the EC reviewed over 100 published papers in an intensive two-day session, involving a number of reviewers hooked in by conference call. The report was formally approved by the EC within two weeks and the completed report was transmitted to the Administrator within a month.

c) The EC conducted five meetings by teleconference in order to take action on more than a dozen reports that would have had to wait for an additional 4-6 weeks before a face-to-face EC meeting. The calls saved money, as well as wear-and-tear on travel-weary SAB Members/Consultants, and they freed up time at EC face-to-face meetings to conduct additional forward-looking business with Agency officials and guests.

4.3.4 Matrix/Strategic Approaches

The matrix approach to reviewing strategic issues, as encouraged by the SPR, bore fruit in FY98, in addition to the examples of increased timeliness described in the previous subsection.

The SAB is nearing completion of its multi-year effort to examine all aspects of environmental decision making. The Integrated Risk Project (IRP) has involved a cross section of Board Members and Consultants. More than 50 technical experts have participated in the five subcommittees and one over-arching Steering Committee. The IRP will result in the recommendation that the Agency adopt a multi-disciplinary Integrated Environmental Decision making (IED) framework. This project is being handled directly out of the EC and will be subjected to outside peer review, in part, because of the large number of EC Members involved in the project.

As noted in Section 3.3.2, the SAB has been active in providing advice to the Agency over the years on the use of computer models. Having stimulated the Agency to re-invigorate its efforts on computer models, the SAB has formed a strategic subcommittee of the EC to serve as a focal point for SAB advice on the generation and use of such models. They have already met and drafted a report on one of the Agency's new multi-media, multi-pathway models: TRIM.FaTE.

Following the SPR, the EC decided to pursue an examination of its own: how the Agency is prepared to address the issue of the use of environmental data for secondary -- in addition to its primary -- purposes. The EC has established a subcommittee, with Members drawn from across the SAB, to look into this matter. Initially, they will serve as advisor to the Center for Environmental Information and Statistics (CEIS), reporting directly to and through the EC.

As noted in Section 3.3.2, the SAB has been invited to have increased input to (and hence, impact on) the science budget deliberations. Through a special subcommittee of the EC, the Board has, for the first time, met with leaders of all of the program offices and key support offices to explore how science is conducted and funded across the Agency. This more holistic look by a more inter-disciplinary, senior SAB committee holds the promise for providing more informed, targeted, and timely advice than has been possible in the past.

4.3.5 Interaction with other Advisory Groups

Cooperative activities between the SAB and the FIFRA Scientific Advisory Panel (SAP) of OPPTS and the Board of Scientific Counselors (BOSC) of ORD continued apace in FY98. SAP chair Dr. Eugene McConnell (ToxPath, Inc.) and BOSC chair Dr. Costel Denson (University of Delaware) were regular participants at meetings of the SAB Executive Committee. In addition, the SAB's Past Chair Dr. Matanoski (Johns Hopkins University) was an active participant in a number of SAP reviews, and SAB Chair Dr. Daisey (Lawrence Berkeley National Laboratory) attended a BOSC meeting.

Dr. Hilary Inyang (Univ of Massachusetts at Lowell) made possible a session on advisory committees as a part of the Fourth International Symposium on Environmental Geotechnology and Global Sustainable Development for which he was the principal organizer. At the session, there were presentations about the structure and functioning of outside, independent advisory bodies to different levels of government:

a) Science Advisory Board of the USEPA--Advisor to the U.S. Government

b) Environment Science Advisory Committee of Columbus--Advisor to the Mayor of Columbus, OH

c) The Health Council of the Netherlands--Advisor to the Netherlands government

The goal was to learn about each other and to explore possible avenues of cooperation/interaction. Following the meeting, a manuscript was prepared and submitted for publication and an action plan developed for taking the "next steps". In addition, since the conference, a developing contact has been made with a representative from a state level advisory group. Specifically, the director of the Michigan Environmental Sciences Advisory Board has been added to the list of SAB Consultants. In FY99 it is likely that liaison participation will occur among these groups on topics of mutual interest.

Within the Agency, responsibility for the overall management of all of the 26 FACA Committees has been given to the Office of Cooperative Environmental Management (OCEM). As one of the largest and long-standing of FACA committees in the Agency, the SAB has been able to assist other committees with their processes and to suggest avenues for further improvements. Bob Flaak is one of the most experienced FACA course trainers in the Federal Government, conducting courses across the Agency and across the country. Pat Thomas has been effective in setting up computer tracking systems that can be used by other committees. Don Barnes and Jack Fowle, with the encouragement of the Executive Committee, have worked with OCEM leadership (Clarence Hardy and Gordon Schisler) to explore strategic utilization of the more than 1400 outside experts that participate in Agency FACA committees. There is a strong feeling that the Agency could derive greater benefit from its large, but limited, FACA resources, if there were a more strategic, coordinated approach to the outside advisory process, particularly as it relates to advice on technical issues. This thrust will be continuing in FY99.

4.4 Staff Office Operations

The Staff Office continues to find ways to improve its services in a climate of constrained resources. Communication is a continuing point of emphasis: with SAB Members/Consultants, with the Agency, and with the public. FY98 marked nearly three years of the primarily electronic distribution of the monthly SAB newsletter, "HAPPENINGS at the Science Advisory Board". The newsletter has transitioned from snail-mail to e-mail to a website version that is easily accessible to millions of readers via the SAB's website.

During FY98 the SAB Website (www.epa.gov/sab) was significantly enhanced. Now Netnicks from near and far can download SAB reports, peruse the SAB calendar for the next six months, check agendas of upcoming meetings, review minutes of recent meetings, and catch up on "Bon Mots" from recent editions of HAPPENINGS. The connection to the Web has dramatically affected the way business is done in the Office. Rather than photocopying and mailing requested copies of SAB reports--which continue to be done, as needed--the Staff can simply refer people to the Web. As the public becomes more aware of the presence, utility, and convenience of the Website, the number of incoming requests will decrease, at the same time that the number of individuals serviced--more rapidly than was previously possible--will increase.

In FY98 the SAB Staff Office moved to a new location where they were consolidated as a unit for the first time in nearly 20 years. With 14 individual and windowed offices, attractive open space, and a handy conference room, the new quarters provide a pleasant and productive atmosphere. Combined with the new computer equipment ordered in FY98, the new accommodations hold great promise for FY99.

4.5 SAB Staff in Transition

Dr. Dorothy Canter, Senior Scientist in the Office of Solid Waste and Emergency Response, served as co-DFO for an IHEC meeting on Disproportionate Impact Analysis Methodologies. She will also assist in preparation and completion of the IHEC report.

Dorothy Clark, Wanda Fields, Diana Pozun and Mary Winston were reclassified to Management Assistant positions, due to the broad and complex nature of their duties and responsibilities in the administration of our various committees.

Roslyn Edson passed the Ceritfied Environmental Trainer exam, specializing in safety and occupational health.

Iason Hotten joined the Committee Operations Staff as a summer-intern from the University of Maryland-Eastern Shore. His contributions were significant to the entire office and he is greatly missed.

Karen L. Martin, a Mississippi Valley State University graduate, joined the Committee Operations Staff through the EPA internship program. She has her master's in biology and will be working with the Designated Federal Officers to learn the ends and outs of running a committee.

Vickie Richardson was promoted to Management Analyst due to the ever increasing analytical responsibilities needed by the office. She also was designated as the Black Employment Program Manager for the Office of the Administrator. She will serve as an advisor to management to assist in the achievement of the Affirmative Employment Program.

Priscilla Tillery-Gadson is now designated as the Program Specialist for the Committee Operations Staff. This new title and position more accurately reflects her duties and responsibilities.

5. PROJECTIONS AND CONCLUSIONS

The calendar for the coming fiscal year is already filling up. The Agency has identified a number of big ticket reviews including the dioxin reassessment and the cancer risk assessment guidelines. In addition to responding to some of the roughly three dozen Agency requests for SAB reviews in FY99, the Board will continue to work on its own set of projects. Foremost among these is the Integrated Risk Project (IRP), the largest and most involved study in the Board's history. Next year will see the SAB working with the Agency in exploring the implementation of the recommendations. Also, following the directions from the Strategic Planning Retreat, individual SAB Committees are exploring more strategic issues in addition to peer review of particular Agency products. Dr. Granger Morgan's Working Group on the role of science in some of the Agency's new approaches plans to hold a workshop to examine this topic more broadly.

In addition to the meat-and-potatoes activities of the Board, FY99 promises additional change, such as the following:

FY99 will likely see implementation of some of ideas for increased interaction among advisory groups. Within the Agency, the SAB will play a role in the nascent FACA Strategic Forum, while we see increased liaison between technically oriented FACA Committees. Outside the Agency, the SAB will seek cooperative activities with other technical advisory committees at the local, state, national, and international level.

The new Conference Room, which is shared with the Office of Small and Disadvantaged Business, is an appropriate setting for the planned display of photographs of the four most recent Chairs of the SAB Executive Committee:

Dr. Norton Nelson, 1984-1988
(New York University)

Dr. Raymond Loehr, 1988-1993
(University of Texas)

Dr. Genevieve Matanoski, 1993-1997
(Johns Hopkins University)

Dr. Joan Daisey, 1997-present
(Lawrence Berkeley National Laboratory)

These photographs will be on display in early FY99.

The SAB Staff will conduct its first Staff Retreat in several years in November. The Retreat leaders, Mr. Ken Wright and Ms. Carol Crawford of the Office Human Resources, have conferred with SAB management and interviewed each Staff member to plan the most appropriate activities for the event. The goal is to make a good organization even better through improved understanding, appreciation, operation, and cooperation.

Therefore, we look forward to FY99 with enthusiasm and anticipation that it will extend the record of accomplishment and transition that is passed on to us from FY98.

APPENDIX A
CHARTERS

A1. Charter of the Science Advisory Board
A2. Charter of the Clean Air Scientific Advisory Committee
A3. Charter of the Advisory Council on Clean Air Compliance Analysis

APPENDIX A1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY ADVISORY COMMITTEE CHARTER

SCIENCE ADVISORY BOARD

1. PURPOSE AND AUTHORITY. This Charter is reissued to renew the Science Advisory Board in accordance with the requirements of the Federal Advisory Committee Act (FACA), 5 U.S.C. App. 2 § 9(c). The former Science Advisory Board, administratively established by the Administrator of EPA on January 11, 1974, was terminated in 1978 when the Congress created the statutorily mandated Science Advisory Board by the Environmental Research, Development, and Demonstration Authorization Act (ERDDAA) of 1978, 42 U.S.C. 4365. The Science Advisory Board charter was renewed October 31, 1979; November 19, 1981; November 3, 1983; October 25, 1985; November 6, 1987; November 8, 1989, November 8, 1991, November 8, 1993, and November 8, 1995.

2. SCOPE OF ACTIVITY. The activities of the Board will include analyzing problems, conducting meetings, reviewing the technical basis of Agency positions, presenting findings, making recommendations, and other activities necessary for the attainment of the Board's objectives. Ad hoc panels may be established to carry out these special activities utilizing consultants (i.e., technical experts) who are not members of the Board.

3. OBJECTIVES AND RESPONSIBILITIES. The objective of the Board is to provide independent advice and peer review to EPA's Administrator on the scientific and technical aspects of environmental problems and issues. While the Board reports to the Administrator, it may also be requested to provide advice to U. S. Senate Committees and Subcommittees and U.S. House Committees and Subcommittees, as appropriate. The Board will review scientific issues, provide independent scientific and technical advice on EPA's major programs, and perform special assignments as requested by Agency officials and as required by the Environmental Research, Development, and Demonstration Authorization Act of 1978, the Clean Air Act Amendments of 1977, and the Clean Air Act Amendments of 1990. Responsibilities include the following:

Reviewing and advising on the adequacy and scientific basis of any proposed criteria document, standard, limitation, or regulation under the Clean Air Act, the Federal Water Pollution Control Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Toxic Substances Control Act, the Safe Drinking Water Act, the Comprehensive Environmental Response, Compensation, and Liability Act, or any other authority of the Administrator;

Reviewing and advising on the scientific and technical adequacy of Agency programs, guidelines, documents, methodologies, protocols, and tests;

Recommending, as appropriate, new or revised scientific criteria or standards for protection of human health and the environment;

Through the Clean Air Scientific Advisory Committee and the Advisory Council on Clean Air

Compliance Analysis, providing the technical review and advice required under the Clean Air Act, as amended in 1977 and 1990;

Reviewing and advising on new information needs and the quality of Agency plans and programs for research, development and demonstration;

Advising on the relative importance of various natural and anthropogenic pollution sources;

As appropriate, consulting and coordinating with the Scientific Advisory Panel established by the Administrator pursuant to section 21 (b) of the Federal Insecticide, Fungicide and Rodenticide Act, as amended; and

Consulting and coordinating with other Federal advisory groups, as appropriate, to conduct the business of the Board.

4. COMPOSITION. The Board will consist of a body of independent scientists, engineers, and economists of sufficient number and diversity to provide the range of expertise required to assess the scientific and technical aspects of environmental issues. The Board will be organized into an executive committee and several specialized committees, all members of which shall be drawn from the Board.

The Board is authorized to constitute such specialized committees and subcommittees as the Administrator and the Board find necessary to carry out its responsibilities. The Administrator will review the need for such specialized committees and subcommittees at least once a year to decide which should be continued. These committees and panels will report through the Executive Committee.

The Administrator also shall appoint a Clean Air Scientific Advisory Committee of the Board to provide the scientific review and advice required by the Clean Air Act Amendments of 1977 and 1990. The Administrator also shall appoint an Advisory Council on Clean Air Compliance Analysis of the Board to provide the scientific review and advice required by the Clean Air Act Amendments of 1977 and 1990. These groups, established by separate charters, will be an integral part of the Board, and their members will also be members of the Science Advisory Board.

5. MEMBERSHIP AND MEETINGS. The Administrator appoints individuals to serve on the Science Advisory Board for two year terms and appoints from the membership a Chair of the Board. The Chair of the Board serves as Chair of the Executive Committee. Chairs of standing committees or ad hoc specialized subcommittees serve as members of the Executive Committee during the life of the specialized subcommittee. Each member of the Board shall be qualified by education, training, and experience to evaluate scientific and technical information on matters referred to the Board. Most members will serve as special Government employees.
There will be approximately 50-60 meetings of the specialized committees per year.

Support for the Board's activities will be provided by the Office of the Administrator, EPA. The estimated total annual operating cost will be approximately $1,638,500 and the estimated Federal permanent Staff support will be 15.9 work years.

6. DURATION. The Board shall be needed on a continuing basis. This charter will be effective until November 8, 1999, at which time the Board charter may be renewed for another two-year period.

November 3, 1997
Agency Approval Date

November 7, 1997
Date Filed with Congress

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APPENDIX A2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY ADVISORY COMMITTEE CHARTER

CLEAN AIR SCIENTIFIC ADVISORY COMMITTEE of the Science Advisory Board

1. PURPOSE. This charter renews the Clean Air Scientific Advisory Committee (CASAC) of the Science Advisory Board in accordance with the requirements of the Federal Advisory Committee Act (FACA), 5 U.S.C. App. 2 § 9(c).

2. AUTHORITY. CASAC was specifically directed by law on August 7,1977, under section 109 of the Clean Air Act, as amended [ACT], (42 U.S.C. 7409), and the charter was renewed on August 6, 1979; July 22, 1981; August 1, 1983; July 23, 1985; August 5, 1987; August 7, 1989; August 7, 1991; September 30, 1993 and August 7, 1995.

3. OBJECTIVE AND SCOPE OF ACTIVITY. CASAC shall provide independent advice on the scientific and technical aspects of issues related to the criteria for air quality standards, research related to air quality, source of air pollution, and the strategies to attain and maintain air quality standards and to prevent significant deterioration of air quality. CASAC shall hold meetings, perform studies, make necessary site visits, and undertake other activities necessary to meet its responsibilities. CASAC will coordinate its activities with other Committees of the Science Advisory Board and may, as it deems appropriate, utilize the expertise of other committees and members of the Science Advisory Board. Establishment of subcommittees is authorized for any purpose consistent with this charter. CASAC will report to the Administrator of the U.S. Environmental Protection Agency.

4. FUNCTIONS. CASAC will review criteria documents for air quality standards and will provide independent scientific advice in response to the Agency's request and, as required by section 109 of the Act shall:

a) Not later than January 1, 1980, and at five year intervals thereafter, complete a review of the criteria published under section 108 of the Clean Air Act and the national primary and secondary ambient air quality standards and recommend to the Administrator any new national ambient air quality standards or revision of existing criteria and standards as may be appropriate,

b) Advise the Administrator of areas where additional knowledge is required concerning the adequacy and basis of existing, new, or revised national ambient air quality standards,

c) Describe the research efforts necessary to provide the required information,

d) Advise the Administrator on the relative contribution to air pollution concentrations of natural as well as anthropogenic activity, and

chairperson. Members of the Council shall be recognized experts in the fields of the health and environmental effects of air pollution, economics analysis, environmental sciences, or such other fields that the Administrator determines to be appropriate. The chairperson of the Council shall serve as a member of the Executive Committee of the Science Advisory Board. Members of the Council may be drawn from the Science Advisory Board and may also serve on its various other committees or study groups. It is expected that the Council will meet two to four times per year. A full time employee of the Agency, who will serve as a Designated Federal Official, will be present at all meetings and is authorized to adjourn any meeting whenever it is determined to be in the public interest. Support shall be provided by EPA through the offices of the Science Advisory Board. The estimated annual operating cost totals approximately $52,700 and 0.5 workyears of staff support.

6. DURATION. The Council will be needed on a continuing basis, and may be renewed for another two year period as authorized in accordance with section 14 of the Federal Advisory Committee Act.

September 27, 1996
Agency Approval Date

November 15, 1996
Date Filed with Congress

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APPENDIX B
MEMBERSHIP

B1. Guidelines for Service on the SAB
B2. Types of Affiliation with the SAB
B3. SAB Members for FY98
B4. SAB Consultants for FY98

APPENDIX B1
GUIDELINES FOR SERVICE ON THE SCIENCE ADVISORY BOARD

Background

The Science Advisory Board (SAB) was established in 1974 by the Administrator. In 1978 the SAB received a Congressional mandate to serve as an independent source of scientific and engineering advice to the EPA Administrator.

The SAB consists of approximately 100 Members, who are appointed by the Administrator. These members serve on specific standing committees. The Chairs of the Committees also serve as members of the Executive Committee, which oversees all of the activities of the Board.

In many of its activities, the members of the Board are supplemented by Consultants, who are appointed by the SAB Staff Director after conferring with the Chair of the Committee on which the consultant is to serve. Also, on occasion, Panels will be supplemented by "liaison members" from other governmental agencies. These people are invited by the Staff Director to participate in an ad hoc manner in order to bring their particular expertise to bear on a matter before the Board.

Both the Executive Committee and the permanent Committees may choose to conduct issue-specific business through Subcommittees that are chaired by SAB members. Reports from Subcommittees are reviewed by the respective permanent Committees. The Executive Committee reviews all reports, independent of their origin, prior to formal transmission to the Administrator. The sole exceptions are reports from the Clean Air Scientific Advisory Committee and the Advisory Council on Clean Air Compliance Analysis, which are separately chartered Federal Advisory Committees operating within the SAB structure.

Criteria for Selection of Members and Consultants

The SAB is chartered as a Federal Advisory Committee, subject to the rules and regulations of the Federal Advisory Committee Act (FACA) (Public Law 92-463). The charter provides guidance and restrictions on selection of SAB members. The four most significant of which are:

a) Members must be qualified by education, training and experience to evaluate scientific and technical information on matters referred to the Board.

b) The composition of Board committees, subcommittees and panels must be "balanced", representing a range of legitimate technical opinion on the matter.

c) No member of the Board may be a full-time government employee.

d) Members are subject to conflict-of-interest regulations.

The scientific and technical quality and the credibility of those selected is a paramount consideration. Secondary factors considered include the geographic, ethnic, gender, and academic/private sector balance of committees. Other factors that contribute to, but do not determine,

the selection include demonstrated ability to work well in a committee process, write well, and complete assignments punctually.

Nominations for membership/consultantship on the Board are accepted at any time. On a biannual basis, the SAB Staff Office publishes a notice in the Federal Register formally soliciting the names of candidates for SAB activities.

Terms of Appointment

Members serve at the pleasure and by appointment of the Administrator. In order to provide suitable terms of service and to insure the infusion of new talent, the following guidelines are generally followed:

Members are generally appointed in October for two-year terms which may be renewed for two additional consecutive terms. Chairs of the standing committees are also appointed for two-year terms which may be renewed for one additional term. If a member is appointed as Chair, this term of service (2-4 years) is added to whatever term of service he/she may accrue as a member. For example,

Years as member	Followed by years as Chair	Followed by year as member	Total years
2	0	0	2
2	2 or 4	0 or 2	4-6
4	2 or 4	0	6-8
6	2 or 4	0	8-10

Reappointment as a member is possible after a two-year hiatus from the SAB, during which time the individual may be called upon to serve as a consultant for a specific issue.

Consultants are appointed to provide the necessary expertise for specific issues. Their terms of appointment are for one year, beginning at any time, and are renewable annually. Their formal appointments may be continued beyond completion of a given project so that their expertise can be quickly assessed in future with a minimum of paperwork.

In general, interagency liaisons participate for the term of issue resolution only.

Member and Consultant Selection Process

Members are appointed by the Administrator based on nominations forwarded by the SAB Staff Director and the Chair of the Executive Committee. These nominations, in turn, are based on recommendations made by the Designated Federal Official (DFO--the member of the SAB Staff with principal responsibility for servicing standing Committees) and the Chairs of the standing Committees. The DFO has the responsibility for developing a list of candidates, utilizing all credible sources, including members of the SAB, other DFOs, EPA staff, staff at the National Academy of Sciences\National Research Council, trade groups, environmental groups, professional organizations, scientific societies, regulated industries, and the informed public.

On occasion, an *ad hoc* Membership Subcommittee of the Executive Committee has been established to assist in the selection process. This group is consulted about possible names and used as a "sounding board" when decisions are being made about appointments. The Membership Subcommittee's principal role is to maintain the integrity of the process and to probe the extent to which objective selection criteria and procedures are being followed. They also raise questions about adherence to the Statement of Intent on Women and Minorities, adopted by the Executive Committee in 1990, which was designed to increase the representation of these groups on the Board.

Consultants are appointed by the Staff Director following a similar procedure.

Panel Selection Process

In general, once the Board and the Agency have agreed upon a topic for SAB review, the subject is assigned to one of the standing Committees. The Committee Chair and the DFO have primary responsibility for forming a review Panel (the full Committee or a Subcommittee, as the case may be.) The Panel will contain some or all members of the Committee. In many instances, consultants may also be added to the Panel in order to obtain specialized expertise on the particular issue under discussion.

A key aspect in the Panel selection process is the "charge", the mutually agreed upon description of what the Agency would like the review to accomplish and/or what the SAB expects to focus upon. The most helpful charge is one that prescribes specific areas/questions that need attention and/or answers. At a minimum, the elements of the charge should be sufficiently precise that the SAB can determine what additional consultant expertise is needed to conduct the most helpful review.

Often the DFO begins by soliciting ideas about potential members from the Agency staff who are intimately acquainted with the issue and will therefore are often aware of the most informed people. A conscious effort is made to avoid selecting individuals who have had a substantive hand in the development of the document to be reviewed. At the same time, experience has shown the utility of having some representation from individuals/groups who may have been involved in prior reviews of the issue or the document. The goal is to minimize the appearance or practice of an individual's reviewing his/her own work, while at the same time, maintaining an historical link to earlier deliberations surrounding the document/issue. Once the Agency staff has suggested nominees and provided background information on the individuals, their direct role in the panel selection process is complete. Agency staff, the requesting office, and others may be consulted at a later stage for information about nominees received from other sources.

The goal is to gather a balanced group of experts who can provide an independent assessment of the technical matters before the Board. Discrete inquiries about the nominees are made with a number of different sources. This might include, for example, making inquiries with editors of newsletters, professional colleagues, and experts who are on "the other side" of the issue. As time and resources permit and controversy demands, names of nominees will be investigated via computer search of their publications and pronouncements in public meetings.

Frequently, a determining factor for selection is the availability of the individual to participate in the public review. In the case of multiple-meeting reviews, the SAB may enlist the assistance of a particularly skilled consultant who cannot attend all meetings, but who is willing to do additional homework and/or participate via conference call.

In some cases, the Panel Chair consults with key members of the Panel for their advice before completing the empaneling process. The final selections for consultants are compiled by the DFO in conjunction with the Chair of the Panel and are submitted to the SAB Staff Director for discussion and appointment.

Conflict-of-Interest and Public Disclosure

The intent of FACA is to construct a panel of knowledgeable individuals who are free of conflicts-of-interest. In this regard, each Panel member must complete a confidential financial information form that is reviewed by the Deputy Ethics Officer, Donald Barnes, to determine whether there are any obvious conflicts-of-interest.

Legal conflict-of-interests generally arise in connection with "particular party matters" (A particular matter is any activity in which an employee participates in an official capacity, where he or other persons have a financial interest, if the direct activity --particular matter-- will have a direct and predictable effect on his own or that person's financial interests.) In general, the SAB (in contrast with the FIFRA Scientific Advisory Panel (SAP)) does not get involved in "particular party matters," hence, legal conflicts-of-interest are rare on the SAB. However, technical conflicts-of-interest can arise, particularly for participants from academic institutions, in connection with Committee recommendations for additional research studies. In most such cases, the DFO's work with the Committee members to apply for waivers from the conflict-of-interest concerns on this matter. The requests for waivers are evaluated on a case-by-case basis by EPA's Office of the General Counsel. (The Agency generally determines that the benefits to the country derived from these experts' recommendations for additional research, outweigh any technical conflict-of-interest that might be involved.)

However, the Board is also concerned about "apparent conflicts-of-interest." Consequently, Members and Consultants to the Panel are generally selected from the "broad middle" spectrum of opinion on the technical issue under discussion. Experience has shown that achieving balance through equal representation of extreme views reduces the chance of achieving a workable consensus--pro or con--that the Agency needs to more forward.

The "public disclosure" (see Attached) process (a standard part of all SAB Committee meetings) is a mechanism aimed resolving the apparent conflicts-of-interest issues. This procedure involves an oral statement (sometimes Board members supplement this with a written document) that lays out the individual's connection with the issue under discussion; e.g., his/her area of expertise, length of experience with the issue, sources of research grants, previous appearance in public forms where he/she might have expressed an opinion, etc. This recitation of prior and/or continuing contacts on the issue assists the public, the Agency, and fellow Panel members understand the background from which particular individual's comments spring, so that those comments can be evaluated accordingly.

Conclusion

These Guidelines are intended to assist the SAB in adhering to the mandates and spirit of the Federal Advisory Committee Act. By following these Guidelines the Board should be well-positioned to provide technically-sound, independent, balanced advice to the Agency. At the same time, they provide assurance that there will be adequate participation by and renewal with well-qualified experts from the various communities served by the Board.

Prepared: Oct 14, 1991
Revised: Nov 26, 1991
Revised: Oct. 12, 1994
Revised: Nov 12, 1996

ATTACHMENT

ATTACHMENT
Guidelines for Public Disclosure at SAB Meetings

Background

Conflict-of-interest (COI) statutes and regulations are aimed at preventing individuals from (knowingly or unknowingly) bringing inappropriate influence to bear on Agency decisions which might affect the financial interests of those individuals. The SAB contributes to the decision-making process of the Agency by evaluating the technical underpinnings upon which rules and regulations are built. SAB Members and consultants (M/Cs) carry our their duties as Special Government Employees (SGE's) and are subject to the COI regulations.

Therefore, in order to protect the integrity of the advisory process itself and the reputations of those involved, procedures have been established to prevent actual COI and minimize the possibility of perceived COI. These procedures include the following:

a) Having M/C's file, at the time of appointment, Special Form OGE-450, Confidential Statement of Employment and Financial Interest. This form is a legal requirement and is maintained by the Agency as a confidential document.

b) Providing M/C's with written material; e.g. copies of the Effect of Special Government Employee Status on Applicability of Criminal Conflict of Interest Statutes and Other Ethics Related Provisions, the Standard of Ethical Conduct Synopsis and Ethics Advisories 97-01 and 96-18.

c) Delivering briefings to M/C's on COI issues on a regular basis.

The following is a description of an additional voluntary[1] procedure that is designed to allow both fellow M/Cs and the observing public to learn more about the backgrounds that M/C's bring to a discussion of a particular issue. In this way, all parties will gain a broader understanding of "where people are coming from" and provide additional insights to help observers and participants evaluate comments made during the discussion.

Procedure

When an agenda item is introduced that has the potential for COI--actual or perceived--the Designated Federal Official (DFO) will ask each M/C on the panel to speak for the record on his/her background, experience, and interests that relate to the issue at hand. The following items are examples of the type of material that is appropriate to mention in such a disclosure:

a) Research conducted on the matter.

[1] Note: The disclosure procedure is voluntary, and members/consultants are not obligated to reveal information contained in their Form 450 that would overwise remain confidential.

b) Previous pronouncements made on the matter.

c) Interests of employer in the matter.

d) A general description of any other financial interests in the matter: e.g., having investments that might be directly affected by the matter.

e) Other links: e.g., research grants from parties--including EPA--that would be affected by the matter.

The DFO will also publicly refer to any waivers from the COI regulations which have been granted for the purposes of the meeting.

The DFO will assure that the minutes of the meeting reflect that fact such disclosures were made and, if possible, the nature of the disclosures. In addition, the minutes should describe any situations in which, in the opinion of the DFO, an actual or perceived COI existed and how the issue was resolved.

APPENDIX B2
TYPES OF AFFILIATION WITH THE SAB

1. SAB Members

SAB members are technically qualified individuals who are appointed to the Board by the Deputy Administrator for two-year terms. Members participate fully in their review committees, which are generally conducted in a collegial, consensus-building style. Their names appear as members on relevant rosters and generated reports.

Note that SAB reports are formally endorsed by SAB members by action of the Executive Committee.

2. SAB Consultants

SAB Consultants are technically qualified individuals who are appointed to the Board by the SAB Staff Director for one-year terms. Generally, Consultants are appointed in order to augment the expertise for a particular review and/or for mutual exploration of future membership on the Board. Consultants participate fully in their review panels and committees, which are generally conducted in a collegial, consensus-building style. Their names appear as Consultants on relevant rosters and generated reports.

3. Federal Experts

The SAB charter precludes Federal employees from being members of the Board. However, in some instances, certain Federal experts have technical knowledge and expertise that can add significant value of the work of the SAB.

In order to access that expertise for the benefit of the Board and the Administrator, the SAB staff will work with the Office of the General Counsel to identify appropriate mechanisms for assessing the potential for conflicts of interest.

The SAB Staff Director can invite Federal experts who do not have a real or apparent conflict-of-interest (either personally or through their agencies) to service on an SAB committee for the duration of a particular the review/study. Federal Experts participate fully on the committees, which are generally conducted in a collegial, consensus-building style. Their names appear as Federal Experts on relevant rosters and generated reports.

4. Invited Expert Resource

In some situations, there are individuals (both Federal employees and non-Federal employees) who have expertise and/or knowledge of data that bears on an SAB review but who also have real or perceived COIs that would preclude their participation as Members or Consultants. There people can attend the SAB meeting as Invited Expert Resources. The SAB pays travel expenses, if needed.

For example, the person could be the author of a key study of PCBs when the EHC is reviewing the

Agency's reference dose for PCBs. The SAB would fund the travel expenses for the person. This person could be either Federal or non-Federal employee. The intent is to have a source real-time, authoritative feedback available during the SAB discussion of the issue. The person would not be asked to serve as a consultant in this case, due to a professional conflict-of-interest; i.e., he would be placed in the position of reviewing his own work.

Another example would be a researcher who has access to some important data, alternative analysis, etc. at another agency, but that is germane to the SAB review. The person would not be asked to serve as a consultant in this case because of a real or apparent conflict-of-interest; e.g., works for an organization (private or Federal) that would be so directly impacted by the Agency's position as to cause a M/C from such an organization to ask for a recusal.

Invited Expert Resources have limited participation in SAB reviews. They are available to answer questions of the SAB committee panel, provide invited presentations, and enlighten the discussion with pertinent pieces of information. Their names are listed as Invited Expert Resources on rosters and reports, with an explanatory footnote recording their presence and role at the meeting. They are not a part of the Board's consensus/decision about the report. The intent is to indicate that such experts were available during the meeting, but that they were not a party to the judgment.

APPENDIX B3
SAB MEMBERS FOR FY98

LAST NAME	FIRST NAME	COMMITTEE	AFFILIATION	CITY, STATE
Acevedo	Miguel	EPEC	University of North Texas	Denton, TX
Adams	William	EPEC/RSAC	Kennecott Utah Cooper Corporation	Magna, UT
Alvarez-Cohen	Lisa	EPEC	University of California-Berkeley	Berkeley, CA
Anderson	Henry	EC/IHEC	Wisconsin Bureau of Public Health	Madison, WI
Bailey	Paul	IHEC	Mobil Business Resource Corp.	Paulsboro, NJ
Bair	William	RAC	Consultant	Richland, WA
Bartell	Steven	EPEC	Cadmus Group, Inc.	Oak Ridge,TN
Bean	Judy	DWC	University of Miami	Miami, FL
Bearer	Cynthia	EHC	Case Western Reserve University	Cleveland, OH
Berkey	Edgar	EEC	Concurrent Technologies Corp.	Pittsburgh, PA
Bockstael	Nancy	EEAC	University of Maryland	College Park,MD
Brown	Stephen	EC/RAC	Risks of Rad Chem Compounds (R2C2)	Oakland, CA
Bull	Richard	EC/DWC	Battelle Pacific Northwest Nat'l Lab	Richland, WA
Cameron	Trudy	EEAC	University of California	Los Angeles, CA
Chien	Calvin	EEC	DuPont Company	Wilmington, DE
Clesceri	Lenore	DWC	Rensselaer Polytechnic Institute	Troy, NY
Colborn	Theodora	RSAC	World Wildlife Fund	Washington, DC
Cooper	Edwin	RSAC	University of California	Los Angeles, CA
Correa	Adolfo	EHC	Johns Hopkins University	Baltimore, MD
Cropper	Maureen	EC/COUNCIL/EEAC	The World Bank	Washington, DC
Cummings	Ronald	COUNCIL	Georgia State University	Atlanta, GA
Cummins	Kenneth	EPEC	S. Florida Water Management District	Sanibel, FL
Daisey	Joan	EC	Lawrence Berkeley Laboratory	Berkeley, CA
Daly	Herman	EEAC	University of Maryland	College Park, MD
Doull	John	EHC	University of Kansas Medical Center	Kansas City, KS
Dragan	Yvonne	DWC	University of Wisconsin	Madison, WI
Dudek	Daniel	COUNCIL	Environmental Defense Fund	New York, NY
Elston	John	CASAC	New Jersey Dept. of Environ. Protection	Trenton, NJ
Evans	John	DWC	Harvard School of Public Health	Boston, MA
Fabryka-Martin	June	RAC	Los Alamos National Laboratory	Los Alamos, NM
Fan-Cheuk	Anna	DWC	California EPA	Berkley, CA
Foecke	Terry	EEC	Waste Reduction Institute	St. Paul, MN
Freeman	A. Myrick	COUNCIL/EEAC	Bowdoin College	Brunswick, ME
French	Nina	EEC	SKY+	Oakland, CA
Gerba	Charles	RSAC	University of Arizona	Tucson, AZ
Gesell	Thomas	RAC	Idaho State University	Pocatello, ID
Goulder	Lawrence	COUNCIL	Stanford University	Stanford, CA
Hall	Jane	COUNCIL	California State University	Fullerton, CA
Harley	Robert	IHEC	University of California-Berkeley	Berkeley, CA
Harwell	Mark	EC/EPEC	University of Miami	Miami, FL
Hoel	David	EHC	Medical University of South Carolina	Charleston, SC

LAST NAME	FIRST NAME	COMMITTEE	AFFILIATION	CITY, STATE
Hoffman	Owen	RAC	SENES Oak Ridge, Inc.	Oak Ridge, TN
Hopke	Philip	CASAC/RSAC	Clarkson University	Potsdam, NY
Inyang	Hilary	EC/EEC	University of Massachusetts-Lowell	Lowell, MA
Jacobson	Jay	CASAC	Boyce Thompson Inst. at Cornell Univ	Ithaca, NY
Johnson	James	EEC	Howard University	Washington, DC
Johnson	Janet	RAC	Shepherd Miller, Inc.	Fort Collins, CO
Johnston	Carol	EPEC	University of Minnesota	Duluth, MN
Jorgenson	Dale	EEAC	Harvard University	Cambridge, MA
Kling	Catherine	EEAC	Iowa State University	Ames, IA
Kolstad	Charles	EEAC	University of California	Santa Barbara, CA
Lebowitz	Michael	IHEC	University of Arizona	Tucson, AZ
Li	Abby	EHC	Monsanto Life Sciences	St. Louis, MO
Lighty	JoAnn	EEC	University of Utah	Salt Lake City, UT
Lioy	Paul	COUNCIL	Env & Occup Health Sciences Institute	Piscataway, NJ
Lippmann	Morton	EC	New York University Medical Center	Tuxedo, NY
Liu	Kai-Shen	IHEC	California Depart of Health Services	Berkeley, CA
Maki	Alan	EC/EPEC	Exxon Company, USA	Houston, TX
Maney	John	EEC	Environmental Measurements Assess	S. Hamilton, MA
Mangione	Ellen	RAC	Colorado Department of Public Health	Denver, CO
Matanoski	Genevieve	EC	Johns Hopkins University	Baltimore, MD
Mauderly	Joe	EC/CASAC	Lovelace Respiratory Research Institute	Albuquerque, NM
McKone	Thomas	IHEC	University of California-Berkeley	Berkeley, CA
McMullen	L. D.	DWC	Des Moines Water Works	Des Moines, IA
Medinsky	Michele	EHC	Chemical Industry Inst of Technology	RTP, NC
Mercer	James W.	EEC	HSI GeoTrans, Incorporated	Sterling, VA
Merges	Paul	RAC	NY State Depart of Env Conservation	Albany, NY
Middleton	Paulette	COUNCIL/RSAC	Rand Ctr for Env. Sciences & Policy	Boulder, CO
Morandi	Maria	IHEC	University of Texas	Houston, TX
Morgan	M. Granger	EC	Carnegie Mellon University	Pittsburgh, PA
Murarka	Ishwar	EEC/RSAC	Ish, Inc.	Cupertino, CA
Nriagu	Jerome	IHEC	University of Michigan	Ann Arbor, MI
O'Melia	Charles	DWC	The Johns Hopkins University	Baltimore, MD
Pellizzari	Edo	DWC	Research Triangle Institute	RTP, NC
Perera	Frederica	EHC	Columbia University	New York, NY
Petersen	Barbara	IHEC	Novigen Sciences, Inc.	Washington, DC
Pfitzer	Emil	EC/EHC	Consultant	Ramsey, NJ
Poston	John	RAC	Texas A&M University	College Station, TX
Preslo	Lynne	EEC	Earth Technology	Long Beach, CA
Repetto	Robert	EEAC	World Resources Institute	Boulder, CO
Roessler	Genevieve	RAC	University of Florida	Elysian, MN
Schmalensee	Richard	COUNCIL/EEAC	Massachusetts Institute of Technology	Cambridge, MA
Seeker	W. Randall	EC/RSAC	Energy & Environmental Research Corp.	Irvine, CA
Silbergeld	Ellen	EC	University of Maryland at Baltimore	Baltimore, MD
Smith	William H.	EPEC/RSAC	Yale University	New Haven, CT
Stavins	Robert	EC/EEAC	Harvard University	Cambridge, MA
Taub	Frieda	EPEC	University of Washington	Seattle, WA

LAST NAME	FIRST NAME	COMMITTEE	AFFILIATION	CITY, STATE
Tietenberg	Thomas	COUNCIL	Colby College	Waterville, ME
Toranzos	Gary	DWC	University of Puerto Rico	San Juan, Puerto Rico
Trussell	R. Rhodes	DWC	Montgomery Watson Consulting Eng.	Pasadena, CA
Upton	Arthur	CASAC	UMDNJ-Robert Wood Johnson Med Ctr	Piscataway, NJ
Utell	Mark	EHC	University of Rochester Medical Center	Rochester, NY
Vedal	Sverre	CASAC	Vancouver General Hospital	Vancouver, BC CAN
Viscusi	W. Kip	EEAC	Harvard Law School	Cambridge, MA
Watson	James E.	RAC	University of North Carolina	Chapel Hill, NC
Weschler	Charles	IHEC	Bell Communication Research	Red Bank, NJ
White	Warren H.	CASAC	Washington University	St. Louis, MO
White	Ronald	IHEC	American Lung Association	Washington, DC
Yates	Marylynn	DWC	University of California	Riverside, CA
Young	Terry F.	EC/EPEC	Environmental Defense Fund	Oakland, CA
Zeise	Lauren	EHC	California EPA	Berkeley, CA

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APPENDIX B4
SAB CONSULTANTS FOR FY98

LAST NAME	FIRST NAME	COMMITTEE	AFFILIATION	CITY, STATE
Adams	E. Eric	EC	Massachusetts Institute of Technology	Cambridge, MA
Albertini	Richard	EHC	University of Vermont	Burlington, VT
Alexander	Martin	EPEC	Cornell University	Ithaca, NY
Alexeeff	George	CASAC	California EPA	Sacremento, CA
Allen	Herbert	RSAC	Universityof Delaware	Newark, DE
Anderson	Mary P.	EEC	University of Wisconsin - Madison	Madison, WI
Anderson	Yolanda	IHEC	North Carolina Central University	Durham, NC
Ansari	Mohammad	EEC	Oshman Group LLC	Chester, VA
Ayres	Stephen M.	CASAC	Virginia Commonwealth University	Richmond, VA
Bailar	John C.	EHC	University of Chicago	Chicago, IL
Bates	David	RAC	University of British Columbia	Vancouver, BC CAN
Beck	Barbara D.	CASAC	Gradient Corp.	Cambridge, MA
Beck	Michael	EHC	University of Georgia	Athens, GA
Bedford	Barbara	EPEC	Cornell University	Ithaca, NY
Bellinger	David	EHC	Children's Hospital	Boston, MA
Biddinger	Gregory	EC	EXXON Company, USA	Houston, TX
Bishop	William E.	EPEC	Procter & Gamble	Cincinnati, OH
Bloom	Nicolas	EHC	Frontier Geosciences, Inc.	Seattle, WA
Boesch	Donald	EPEC	University of Maryland	Cambridge, MD
Bond	James A.	EHC	Chemical Industry Inst. of Technology	RTP,NC
Boston	Harry L.	EPEC	Lockheed Martin Energy Systems	Oakridge, TN
Bostrom	Anne	RAC	Georgia Institute of Technology	Atlanta, GA
Bowers	Dorothy	EEC	Merck & Company, Inc.	Whitehouse Stn., NJ
Brierley	Corale	EPEC	VistaTech Partnership, Ltd.	Highlands Ranch, CO
Brown	Gardener	COUNCIL	University of Washington	Seattle, WA
Brown	Halina S.	EHC	Clark University	Worcester, MA
Brown	Linfield	EC	Tufts University	Medford, MA
Buchsbaum	Robert	EPEC	Massachusetts Audubon Society	Wenham, MA
Buffler	Patricia	CASAC	University of California	Berkeley, CA
Buist	A. Sonia	CASAC	Oregon Health Sciences University	Portland, OR
Bunn	William	EHC	Navistar International	Chicago, Il
Burbacher	Thomas	EHC	University of Washington	Seattle, WA
Burtraw	Dallas	EHC	Resources for The Future	Washington, DC
Byus	Craig	RAC	University of California at Riverside	Riverside, CA
Carlson	Gary P.	EHC	Purdue University	West Lafayette, IN
Carns	Keith E.	DWC	Washington University	St. Louis, MO
Carpenter	George F.	EEC	Michigan Dept of Natural Resources	Lansing, MI
Chapman	Peter	EPEC	EVS Environment Consultants	Vancouver, BC, CAN
Charbeneau	Randall J.	EEC	University of Texas at Austin	Austin, TX
Chess	Caron	EC/VS	Cook College/Rutgers University	New Brunswick, NJ
Christman	Russell	DWC	University of North Carolina	Chapel Hill, NC

LAST NAME	FIRST NAME	COMMITTEE	AFFILIATION	CITY, STATE
Clapp	Richard	EHC	Boston University	Boston, MA
Cochran	Roger	RSAC	California EPA	Sacramento, CA
Colome	Steven	CASAC	Integrated Environmental Services	Irvine, CA
Conway	Richard A.	EEC	Union Carbide Corporation	Charleston, WV
Cooper	William E.	EPEC	Michigan State University	East Lansing, MI
Coppock	Robert	EEC	Consultant	Falls Church, VA
Cortese	Anthony D.	RSAC	Second Nature	Boston, MA
Cory-Slechta	Deborah	EPEC	University of Rochester	Rochester, NY
Costanza	Robert	EPEC	University of Maryland/CEES/CBL	Solomons Island, MD
Cox	Dennis	CASAC	Rice University	Houston, TX
Crapo	James D.	CASAC	National Jewish Medical & Research Ctr.	Denver, CO
Crump	Kenny	EHC	ICF Kaiser	Ruston, LA
Cutshall	Norman H.	EC/IEL	Oak Ridge National Laboratory	Germantown, MD
Dabberdt	Walter	EPEC	National Ctr for Atmos Research	Boulder, CO
Dale	Virginia	EPEC/RSAC	Oak Ridge National Laboratory	Oak Ridge, TN
Daston	George P.	EHC	Miami Valley Labs, Procter & Gamble	Cincinnati, OH
Davies	Terry	EC	Resources for the Future	Washington, DC
Davis	Mary	DWC	West Virginia University	Morgantown, WV
Deisler	Paul F.	RSAC	Shell Oil Company	Austin, TX
D'Elia	Christopher	EPEC	University of Maryland	College Park, MD
Dellinger	Harold B.	EEC	University of Dayton	Dayton, OH
Dellinger	John A.	EHC	Medical College of Wisconsin	Milwaukee, WI
Denison	Richard	EEC	Environmental Defense Fund	Washington, DC
Diamond	Gary L.	EHC	Syracuse Research Corporation	Syracuse, NY
Diaz-Sanchez	David	CASAC	University of California	Los Angeles, CA
Dickson	Kenneth L.	EPEC	University of North Texas	Denton, TX
Dietrich	Kim	EHC	Univeristy of Cincinnati	Cincinnati, OH
Dietz	Thomas	EC/Val Sub	George Mason University	Fairfax, VA
DiGiovanni	John	RAC	University of Texas	Smithville, TX
DiGiulio	Richard	EPEC	Duke University	Durham, NC
Dockery	Douglas W.	CASAC	Harvard School of Public Health	Boston, MA
Dorn	Philip B.	EPEC	Shell Development Company	Houston, TX
Dudek	Daniel J.	COUNCIL	Environmental Defense Fund	New York, NY
Durbin-Heavey	Patricia	RAC	Lawrence Berkeley National Laboratory	Berkeley, CA
Ediger	Richard	EEC	The Perkin-Elmer Corporation	Norwalk, CT
Elliot	Diane L.	EHC	Oregon Health Sciences University	Portland, OR
Ensley	Burt D.	EPEC	Phytotech	Monmouth Jct, NJ
Epstein	Lois	EEC	Environmental Defense Fund	Washington, DC
Estabrook	Ronald W.	EHC	University of Texas, SW Med Ctr	Dallas, TX
Ewing	Ben B.	RSAC	University of Illinois-Urbana	Lummi Island, WA
Faison	Brendlyn	EEC	Oak Ridge Natinal Laboratory	Oak Ridge, TN
Faustman	Elaine	EHC	University of Washington	Seattle, WA
Feero	William	RAC	Electric Research & Mgmt, Inc.	State College, PA
Fischer	Lawrence	EHC	Michigan State University	East Lansing, MI
Fischhoff	Baruch	CASAC	Carnegie Mellon University	Pittsburgh, PA
Fisher	Gerald	CASAC	Sandoz Research Institute	E. Hanover, NJ

LAST NAME	FIRST NAME	COMMITTEE	AFFILIATION	CITY, STATE
Fowler	Bruce	EHC	University of Maryland	Baltimore, MD
Frantz	Robert W.	EEC	General Electric Company	Cincinnati, OH
Frey	H. Christopher	EC	North Carolina State University	Raliegh, NC
Gallagher	John	EPEC	University of Delaware	Lewes, DE
Gallo	Michael	EHC	UMDNJ-Robert Wood Johnson Med	Piscataway, NJ
Gandolfi	A. Jay	DWC	University of Arizona	Tucson, AZ
Garber	Steven	COUNCIL	RAND	Santa Monica, CA
Garshick	Eric	CASAC	Brockton/West Roxbury	West Roxbury, MA
Gasiewicz	Thomas A.	EHC	University of Rochester	Rochester, NY
Gentile	Thomas J.	EC	NY State Dept of Environ. Conservation	Albany, NY
Gentry	Bradford S.	EEC	Yale University	New Haven, CT
Giesy	John P.	EPEC	Michigan State University	East Lansing, MI
Gilbert	Richard O.	EHC	Battelle Memorial Institute	Washington, DC
Gilbert	Steven	EHC	Biosupport, Inc.	Redmond, WA
Gilmour	Cynthia	EHC	The Academy of Natural Sciences	St. Leonard, MD
Ginevan	Michael	RAC	M.E. Ginevan & Associates	Silver Spring, MD
Glaze	William	EC	University of North Carolina	Chapel Hill, NC
Gold	Arthur	EC	University of Rhode Island	Kingston, RI
Goldstein	Bernard	EHC	Env & Occ. Health Sciences Institute	Piscataway, NJ
Goldstein	Robert A.	CASAC	Electric Power Research Institute	Palo Alto, CA
Gonzalez-Mendez	Ricardo	RAC	University of Puerto Rico	San Juan, PR
Gordon	Theodore	EEC	Consultant	Vero Beach, FL
Gosselink	James G.	EPEC	Consultant	Baton Rouge, LA
Gough	Michael	EHC	CATO Institute	Washington, DC
Goyer	Robert	EHC	Consultant	Chaple Hill, NC
Graham	John D.	EHC	Harvard University	Boston, MA
Grasso	Domenico	EEC	University of Connecticut	Storrs, CT
Greenberg	Michael	EEC	Rutgers University	New Brunswick, NJ
Greenlee	William	EHC	Univeristy of Massachusetts	Worcester, MA
Greer	Linda	EEC	Natural Resources Defense Council	Washington, DC
Grimes	Darrell	DWC	Institute of Marine Sciences	Ocean Springs, MS
Groer	Peter	RAC	University of Tennessee	Knoxville, TN
Grogan	Helen Ann	EC	Cascade Scientific, Inc.	Bend, OR
Guilmette	Raymond	RAC	Lovelace Respiratory Research Inst	Albuquerque, NM
Guiseppi-Elie	Annette	IHEC	Exxon Biomedical Sciences, Inc.	East Millstone, NJ
Guzelian	Philip	EHC	University of Colorado	Denver, CO
Hallberg	George	EEC	The Cadmus Group, Inc.	Waltham, MA
Hamilton	Martin	DWC	Montana State University	Bozeman, MT
Hammond	S. Katherine	IHEC	University of California	Berkeley, CA
Harper	Barbara	EC	Yakama Indian Nation	Richland, WA
Harris	Robert L.	RAC	University of North Carolina	Chapel Hill, NC
Hartung	Rolf	EPEC	University of Michigan	Ann Arbor, MI
Hattis	Dale	CASAC	Clark University	Worcester, MA
Hausman	Jerry A.	EC/VS	Massachusetts Institute of Technology	Cambridge, MA
Hawkins	Charles	EPEC	Utah State University	Logan, UT
Hazen	Robert	IHEC	NJ Dept. of Envir. Protection & Energy	Trenton, NJ
Heath	Clark	RAC	American Cancer Society	Atlanta, GA

LAST NAME	FIRST NAME	COMMITTEE	AFFILIATION	CITY, STATE
Hefland	Gloria	EEAC	University of Michigan	Ann Arbor, MI
Henderson	Rogene	EHC	Lovelace Biomedical & Env. Rsch Inst	Albuquerque, NM
Hites	Ronald A.	IHEC	Indiana University	Bloomington, IN
Hueter	Robert	EHC	Mote Marine Laboratory	Sarasota, FL
Humphrey	Harold	EHC	Michigan Public Health Institute	East Lansing, MI
Hurley	James	EHC	University of Wisconsin	Madison, WI
Jacobson	Joseph	EHC	Wayne State University	Detroit, MI
Jahnke	James	EEC	Source Technology Associates	RTP, NC
Jasanoff	Shelia	EC	Harvard University	Cambridge, MA
Jayjock	Michael	IHEC	Rohm and Haas Co.	Spring House, PA
Jeffries	Harvey E.	CASAC	University of North Carolina	Chapel Hill, NC
Jenkins	Kenneth	EPEC	California State University	Long Beach, CA
Johnson	Charles C.	DWC	Rear Admiral (PHS) Retired	Washington, DC
Johnson	E. Marshall	EHC	Jefferson Medical College	Philadelphia, PA
Joskow	Paul	EEAC	Massachusetts Institute of Technology	Cambridge, MA
Kabat	Geoffrey C.	IHEC	State University of NY at Stony Brook	Stony Brook, NY
Kachel	Wayne M.	EEC	Mele Associates (HSC/XRE)	Brooks AFB, TX
Kahn	Bernd	RAC	Georgia Institute of Technology	Atlanta, GA
Kalton	G. Graham	RAC	Westat	Rockville, MD
Kaminski	Norbert	EHC	Michigan State University	East Lansing, MI
Kareiva	Peter	EPEC	University of Washington	Seattle, WA
Kasperson	Roger E.	EPEC	Clark University	Worcester, MA
Kaufman	David G.	DWC	University of North Carolina	Chapel Hill, NC
Kendall	Ronald	EPEC	Institute of Env & Human Health	Lubbock, TX
Kelsey	Karl	EHC	Harvard School of Public Health	Boston, MA
Kim	Nancy K.	EHC	New York Department of Health	Albany, NY
Kimerle	Richard A.	EPEC	Monsato Company	Eureka, MO
Kingsley	Gordon	EEC	Georgia Institute of Technology	Atlanta, GA
Klaassen	Curtis	DWC	University of Kansas	Kansas City, KS
Kleinman	Michael	COUNCIL	University of California	Irvine, CA
Kneese	Allen	EEAC	Resources for the Future	Washington, DC
Knobeloch	Lynda	EHC	Wisconsin Dept Health & Family Serv	Madison, WI
Knopman	Debra	EC	Progressive Policy Institute	Washington, DC
Knuckles	Maurice	IHEC	Meharry Medical College	Nashville, TN
Koenig	Jane Q.	CASAC	University of Washington	Seattle, WA
Koutrakis	Petros	CASAC	Harvard University	Boston, MA
Kreamer	David K.	RAC	University of Nevada	Las Vegas, NV
Kripke	Margaret	RSAC	M.D. Anderson Cancer Ctr	Houston, TX
Krupnick	Alan J.	COUNCIL	Resources for the Future	Washington, DC
La Point	Thomas W.	EPEC	Clemson University	Pendleton, SC
Laird	Nan M.	RAC	Harvard School of Public Health	Boston, MA
Lamb	James C.	RSAC	Jellinek, Schwartz & Connolly, Inc.	Arlington, VA
Larntz	Kinley	CASAC	University of Minnesota	Shoreview, MN
Larson	Timothy V.	IHEC	Univeristy of Washington	Seattle, WA
Lave	Lester B.	COUNCIL	Carnegie-Mellon University	Pittsburgh, PA
Leaderer	Brian P.	IHEC	Yale School of Medicine	New Haven, CT
Lee	Kun-Chieh	EC/HWIR	Union Carbide Corporation	S. Charleston, WV

LAST NAME	FIRST NAME	COMMITTEE	AFFILIATION	CITY, STATE
Legge	Allan	CASAC	Biosphere Solutions	Calgary, Alberta,CAN
Lewis	Robert J.	EC	Exxon Biomedical Sciences, Inc.	East Millstone, NJ
Lewis	Steve C.	EHC	Exxon Biomedical Sciences, Inc.	East Millstone, NJ
Lindberg	Steve	EHC	Oak Ridge National Laboratory	Oak Ridge, TN
Little	John C.	IHEC	Virginia Tech	Blacksburg, VA
Loehr	Raymond C.	EC	University of Texas at Austin	Austin, TX
Longo	Lawrence D.	CASAC	Loma Linda University	Loma Linda, CA
Loomis	John B.	EEAC	Colorado State University	Fort Collins, CO
Lue-Hing	Cecil	DWC	Metropolitan Water Recl District	Chicago, IL
Lung	Wu-Seng	EPEC	University of Virginia	Charlottesville, VA
Lurmann	Frederick	IHEC	Sonoma Technology, Inc.	Santa Rosa, CA
Luthy	Richard G.	EEC	Carnegie-Mellon University	Pittsburgh, PA
MacGregor	Judy	EHC	Consultant	Bethesda, MD
Mack	Thomas M.	EHC	University of Southern California	Los Angeles, CA
MacKay	Donald	EPEC	University of Toronto	Toronto, Ontario
MacLean	Douglas E.	EC/VS	University of Maryland	Baltimore, MD
Mahadevan	Kumar	EPEC	Mote Marine Laboratory	Sarasota, FL
Malone	Thomas	EPEC	Horn Point Environmental Laboratory	Cambridge, MA
Manning	William	CASAC	University of Massachusetts	Amherst, MA
Martin	James	RAC	University of Michigan	Ann Arbor, MI
Marty	Melanie	CASAC	California EPA	Berkeley, CA
Massmann	Joel	EEC	University of Washington	Seattle, WA
McBee	Karen	EPEC	Oklahoma State University	Stillwater, OK
McClellan	Roger O.	RSAC	Chemical Industry Inst of Toxicology	RTP, NC
McCurdy	David E.	RAC	Yankee Atomic Electric Company	Bolton, MA
McCurdy	Leyla	IHEC	American Lung Association	Washington, DC
McElroy	Anne	EPEC	State University of New York	Stony Brook, NY
McFarland	Michael J.	EEC	Utah State University	River Heights, UT
McFeters	Gordon	DWC	Montana State University	Bozeman, MT
McLachlan	John A.	EHC	Tulane/Xavier Ctr for Bioenv Res	New Orleans, LA
McManus	Terrence	EEC	Intel Corporation	Chandler, AZ
McMichael	Francis C.	EEC	Carnegie-Mellon University	Pittsburgh, PA
Meagher	James F.	COUNCIL	Nat. Oceanic & Atmospheric Admin.	Boulder, CO
Meijer	Arend	RAC	GCX Inc.	Albuquerque, NM
Mendelsohn	Robert	COUNCIL	Yale School of Forestry & Env. Studies	New Haven, CT
Menzel	Daniel B.	EHC	University of California-Irvine	Irvine, CA
Meyer	Joseph S.	COUNCIL	Univeristy of Wyoming	Laramie, WY
Meyer	Michael	EHC	Wisconsin Depart of Natural Res	Rhinelander, WI
Meyer	H. Robert	RAC	Keystone Science	Fort Collins, CO
Milford	Jana	EC	University of Colorado	Boulder, CO
Miller	Frederick J.	EHC	Chemical Industry Inst of Toxicology	RTP, NC
Milon	J. Walter	EPEC	University of Florida	Gainesville, FL
Moe	Christine	DWC	University of North Carolina	Chapel Hill, NC
Molina	Nicholas	EEC	Department of Environmental Protection	Harrisburg, PA
Monson	Richard	EHC	Harvard School of Public Health	Boston, MA
Moomaw	William R.	EPEC	Tufts University	Medford, MA
Mueller	Peter K.	CASAC	Electric Power Research Institute	Palo Alto, CA

LAST NAME	FIRST NAME	COMMITTEE	AFFILIATION	CITY, STATE
Mushak	Paul	CASAC	PB Associates	Durham, NC
Napier	Bruce A.	RAC	Pacific Northwest National Laboratory	Richland, WA
Natan	Thomas	EEC	Environmental Information Center	Washington, DC
Nerode	Anil	RSAC	Department of Mathematics	Ithaca, NY
Neuberger	John S.	EHC	University of Kansas	Kansas City, KS
Newland	M. Christopher	EHC	Auburn University	Auburn, AL
Nixon	Scott	EPEC	University of Rhode Island	Narrangansett, RI
Nordhaus	William	COUNCIL	Yale University	New Haven, CT
North	D. Warner	CASAC	North Works	Mountain View, CA
Norton	Bryan	EEAC	Georgia Institute of Technology	Atlanta, GA
Nygaard	Oddvar	RAC	Case Western Reserve University	Cleveland, OH
Oates	Wallace	COUNCIL	University of Maryland	College Park, MD
Oberdoster	Gunter	CASAC	University of Rochester	Rochester, NY
O'Connor	Mary Ellen	RAC	University of Tulsa	Tulsa, OK
Olivieri	Adam	DWC	EOA, Inc.	Oakland, CA
Omenn	Gilbert	CASAC	University of Michigan	Ann Arbor, MI
Oppenheimer	Michael	CASAC	Environmental Defense Fund	New York, NY
Otwell	Steve	EHC	University of Florida	Gainesville, FL
Ozonoff	David M.	EHC	Boston University	Boston, MA
Parker	Frank L.	RAC	Vanderbilt Universtity	Nashville, TN
Parkin	Rebecca	EEC	American Public Health Association	Washington, DC
Parkinson	David K.	EHC	Long Island Occ & Env Health Ctr	Port Jefferson, NY
Paustenbach	Dennis J.	EC	McLarn/Hart	Alameda, CA
Payne	John W.	EC/VS	Duke Univeristy	Durham, NC
Payton	Marinelle	IHEC	Harvard Med. School and Public Health	Boston, MA
Pease	William S.	IHEC	Environmental Defense Fund	Oakland, CA
Peck	Stephen	EEAC	Electric Power Research Institute	Palo Alto, CA
Peeler	James	EEC	Emission Monitoring Inc.	Raleigh, NC
Peterson	Leif	RAC	Baylor College of Medicine	Houston, TX
Peterson	Richard	EPEC	University of Wisconsin	Madison, WI
Pfaender	Frederic K.	EPEC	University of North Carolina	Chapel Hill, NC
Pierce	Donald	RAC	Oregon State University	Corvalllis, OR
Pierson	William R.	CASAC	Desert Research Institute	Reno, NV
Pitot	Henry C.	EHC	University of Wisconsin	Madison, WI
Pittinger	Charles A.	EPEC	The Procter & Gamble Co.	Cincinnati, OH
Plaa	Gabriel	EHC	University of Montreal	Montreal, Queb, CAN
Podkulski	Daniel	EEC	Chevron Research and Technology	Richmond, CA
Pohland	Frederick	EEC	University of Pittsburgh	Pittsburgh, PA
Pojasek	Robert B.	EEC	Pojasek & Associates	East Arlington, MA
Portney	Paul	EC/EEAC	Resources for the Future	Washington, DC
Power	Alison G.	EPEC	Cornell University	Ithaca, NY
Price	James	CASAC	Texas Natural Res. Conservation Comm.	Austin, TX
Rabinowitz	Michael B.	CASAC	Marine Biological Laboratory	Woods Hole, MA
Rall	David	EHC/DWC	Consultant	Washington, DC
Ray	Verne A.	EC/DWC	Pfizer, Inc.	Groton, CT
Real	Leslie A.	EPEC	Indiana University	Bloomington, IN
Reed	Donald	EHC	Oregon State University	Corvallis, OR

LAST NAME	FIRST NAME	COMMITTEE	AFFILIATION	CITY, STATE
Reuhl	Kenneth R.	EHC	Rutgers University	Piscataway, NJ
Revesz	Richard	EEAC	New York City School of Law	New York, NY
Rice	Deborah	EHC	Consultant	Islesboro, ME
Ringen	Knut	EHC	Center to Protect Workers' Rights	Des Moines, WA
Risser	Paul G.	EPEC	Oregon State University	Corvallis, OR
Rocco	James R.	EEC	BP Exploration and Oil Inc.	Cleveland, OH
Rockette	Howard	IHEC	University of Pittsburgh	Pittsburgh, PA
Rodier	Patricia	EHC	University of Rochester	Rochester, NY
Rose	Joan B.	DWC	University of South Florida	St. Petersburg, FL
Roth	Philip	CASAC	Envair	San Anselmo, CA
Rowe	Robert D.	COUNCIL	Hagler Bailly Services	Boulder, CO
Rozman	Karl K.	EHC	University of Kansas Medical Center	Kansas City, KS
Russell	Clifford S.	EPEC	Vanderbilt University	Nashville, TN
Russell	Milton	EC/IRP	Joint Institute for Energy & Env	Knoxville. TN
Ryan	John Jake	EHC/IHEC	Health Canda	Ottawa, Canada
Safe	Stephen H.	EHC	Texas A&M University	College Station, TX
Samet	Jonathan M.	IHEC	John Hopkins University	Baltimore, MD
Schenck	Rita C.	EEC	Eco Sense, Inc.	West Rutland, VT
Schlager	Edella	EC/VS	Universitiy of Arizona	Tucson, AZ
Schlesinger	Richard	EHC	New York University Medical Center	Tuxedo, NY
Schnoor	Jerald	EPEC	University of Iowa	Iowa City, IA
Schreck	Richard	CASAC	General Motors Corp.	Warren, MI
Schubel	Jerry	EC/EPEC	The New England Aquarium	Boston, MA
Schull	William	RAC	Univeristy of Texas	Houston, TX
Scialli	Anthony	EHC	Georgetown University Medical School	Washington, DC
Segerson	Kathleen	CASAC	University of Connecticut	Storrs, CT
Seigneur	Christian	CASAC	Atmospheric & Env Rsch, Inc.	San Ramon, CA
Sextro	Richard	RAC	Lawrence Berkeley National Lab	Berkeley, CA
Shannon	Margaret	EC/VS	Syracuse University	Syracuse, NY
Shogren	Jason	EEAC	University of Wyoming	Laramie, WY
Shore	Roy	EHC	New York University Medical Center	New York, NY
Shy	Carl M.	CASAC	University of North Carolina	Chapel Hill, NC
Sigman	Hilary	EEAC	University of California	New Brunswick, NJ
Silverstone	Allen E.	EHC	State University of New York	Syracuse, NY
Simonin	Howard	EHC	New York State Dept of Env. Cons	Rome, NY
Sinclair	Warren	RAC	National Council on Radiation Prot	Bethesda, MD
Skelly	John	CASAC	Pennsylvania State University	University Park, PA
Small	Mitchell	EEC	Carnegie Mellon University	Pittsburgh, PA
Smith	Clifford V.	RAC	GE Foundation	Fairfield, CT
Snoeyink	Vernon L.	DWC	University of Illinois	Urbana, Il
Sobsey	Mark D.	DWC	University of North Carolina	Chapel Hill, NC
Spacie	Anne	EPEC	Purdue University	West Lafayette, IN
Speizer	Frank	CASAC	Harvard Medical School	Boston, MA
Spengler	John D.	CASAC	Harvard University	Boston, MA
Splitstone	Douglas	EEC	Splitstone and Associates	Murrysville, PA
Stein	Michael	EC	University of Chicago	Chicago, IL
Stohs	Sidney	EHC	Creighton University	Omaha, NE

LAST NAME	FIRST NAME	COMMITTEE	AFFILIATION	CITY, STATE
Stolwijk	Jan	IHEC	Yale University School of Medicine	New Haven, CT
Stolzenbach	Keith	EC	University of California	Los Angeles, CA
Stout	Judy	EPEC	Marine Env Sciences Consortium	Dauphin Island, AL
Strimaitis	David	EHC	Earth Tech	Concord, MA
Susskind	Charles	RAC	University of California	Berkeley, CA
Suter	Glenn	CASAC	Oak Ridge National Laboratory	Oak Ridge, TN
Swenberg	James A.	EHC	University of North Carolina	Chapel Hill, NC
Taylor	George E.	CASAC	George Mason University	Fairfax, VA
Templet	Paul H.	EC/IRP	Louisiana State University	Baton Rouge, LA
Tephly	Thomas R.	DWC	University of Iowa	Iowa City, IA
Thein	Myint	EC	Oak Ridge National Laboratory	Oak Ridge, TN
Theis	Thomas	EC	Clarkson University	Potsdam, NY
Thomas	Valerie	IHEC	Princeton University	Princeton, NJ
Tiedje	James M.	EPEC	Michigan State University	East Lansing, MI
Tikuisis	Peter	CASAC	Defense Civil Inst of Env. Medicine	N. York, Ontario, CAN
Toman	Michael	EEC	Resources for the Future	Washington, DC
Tonn	Bruce	EC	Oak Ridge National Laboratory	Oak Ridge, TN
Tran	Nga L.	EEC	Johns Hopkins University	Baltimore, MD
Trehy	Michael	RSAC	Monsanto Corporation	St. Louis, MO
Trulear	Michael G.	EEC	ChemTreat, Inc.	Richmond, VA
Valentine	Jane	EHC	University of California	Los Angeles, CA
Van Knoynenburg	Richard A.	RAC	Lawrence Livermore National Lab	Livermore, CA
Voilleque	Paul	RAC	MJP Risk Assessment, Inc.	Idaho Falls, ID
von Lindern	Ian	CASAC	TerraGraphics Env Engineering	Moscow, ID
Walton	Barbara	EPEC	Oak Ridge National Laboratories	Oak Ridge, TN
Ward	C. Herb	EEC	Rice University	Houston, TX
Weis	Judith S.	EPEC	Rutgers University	Newark, NJ
Weiss	Bernard	EHC	University of Rochester	Rochester, NY
Whipple	Christopher	RAC	ICF Kaiser	Oakland, CA
Williams	Marcia	RSAC	Putnam,Hayes & Bartlett, Inc.	Los Angeles, CA
Williams	Philip B.	EPEC	Philip Williams & Associated, Ltd.	San Francisco, CA
Wilson	Richard	RAC	Harvard University	Cambridge, MA
Windom	Herbert L.	EPEC	Skidaway Institute of Oceanography	Savannah, GA
Winner	William	EPEC	Oregon State University	Corvallis, OR
Witschi	Hanspeter	RSAC	University of California-Davis	Davis, California
Wolff	George T.	EC/CASAC	General Motors Env. & Energy Staff	Detroit, MI
Wolff	Ronald K.	CASAC	Eli Lillly & Company	Greenfield, IN
Wood	Ronald W.	CASAC	New York University Medical Center	New York, NY
Woods	James E.	IHEC	HP-Woods Research Institute	Herndon, VA
Wright	Steven	EC	University of Michigan	Ann Arbor,MI
Wyzga	Ronald	EHC	Electric Power Research Institute	Palo Alto, CA
Yosie	Terry F.	EC/Futures	Ruder Finn - Washington	Washington, DC
Zacharewski	Timothy R.	EHC	Michigan State University	East Lansing, MI
Zedler	Joy B.	EPEC	San Diego State University	San Diego, CA

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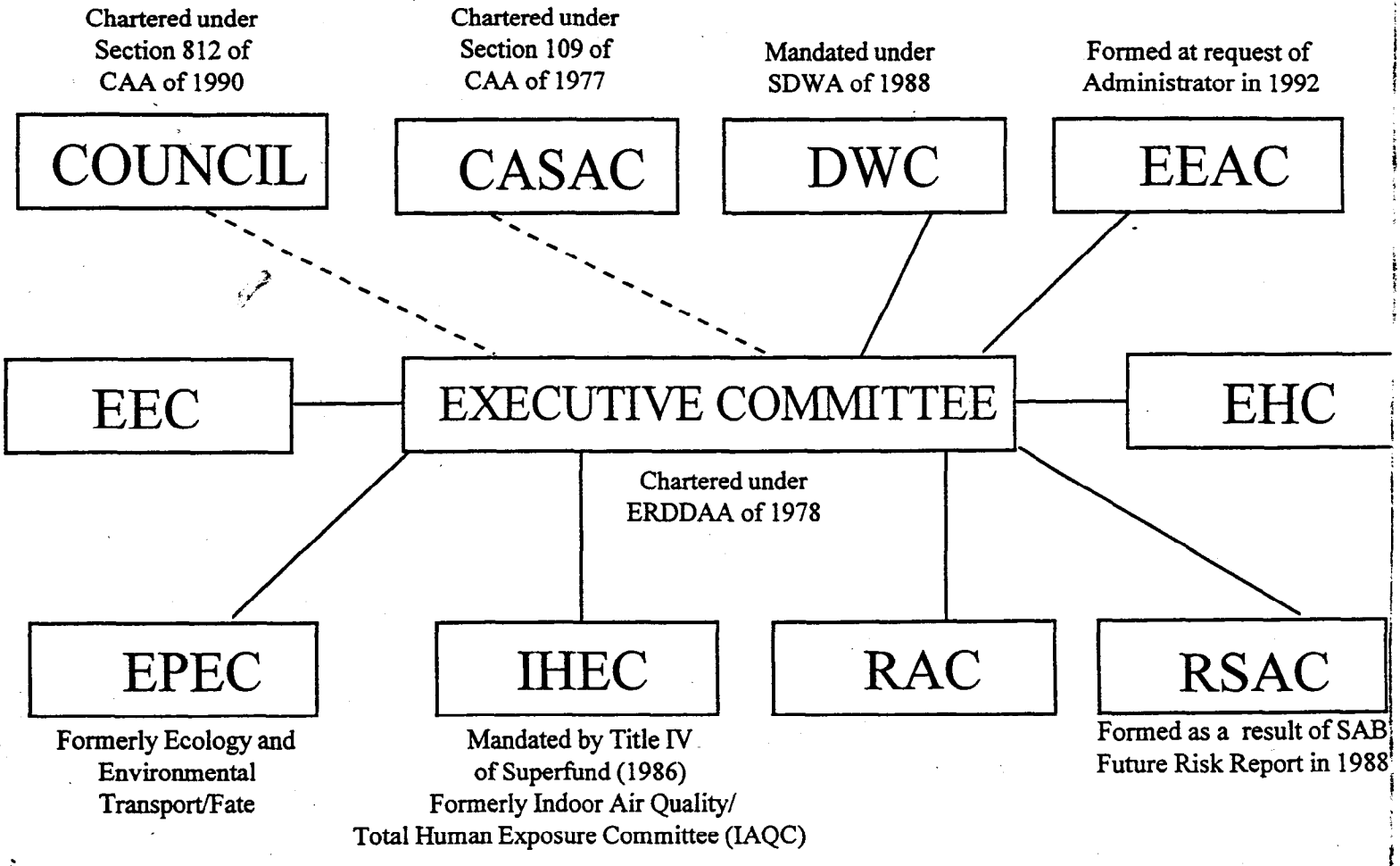
Appendix C Science Advisory Board Organizational Chart

U.S. Environmental Protection Agency
Science Advisory Board



All Committees (except COUNCIL and CASAC which report directly) report to the Administrator through the Executive Committee

Council=Advisory Council on Clean Air Compliance Analysis, CASAC=Clean Air Scientific Advisory Committee, DWC=Drinking Water Committee, EEAC=Environmental Economics Advisory Committee, EEC=Environmental Engineering Committee, EHC=Environmental Health Committee, EPEC=Ecological Processes & Effects Committee, IHEC=Intergrated Human Exposure Committee, RAC=Radiation Advisory Committee, RSAC=Research Strategies Advisory Committee

APPENDIX D
STAFF SUPPORT AND COMMITTEE LEADERSHIP IN FY98

Some of the following positions were filled by two people during the year as changes in personnel or staff alignments were made. Where two persons occupied a position during the year, both are listed. The latter name is the incumbent at the close of FY98.

I - STAFF STRUCTURE

STAFF DIRECTOR'S OFFICE

Staff Director:	Dr. Donald G. Barnes
Special Assistant:	Ms. Anne Barton
Program Specialist:	Ms. Priscilla Tillery-Gadson
NOWCC Office Assistant:	Ms. Betty Fortune

DEPUTY STAFF DIRECTOR

Deputy Staff Director:	Dr. John R. Fowle III
Program Specialist:	Ms. Priscilla Tillery-Gadson

Committee Evaluation and Support Staff

Team Leader:	Ms. Patricia Thomas
Management Analyst:	Ms. Janice Cuevas
Project Coordinator:	Ms. Carolyn Osborne
Management Analyst:	Ms. Vickie Richardson
Student Intern:	Mr. Derrick Pope

Committee Operations Staff

Team Leader: Mr. A. Robert Flaak
Designated Federal Officers:
- Ms. Kathleen Conway
- Ms. Roslyn Edson
- Dr. K. Jack Kooyoomjian
- Ms. Karen Martin
- Mr. Tom Miller
- Mr. Samuel Rondberg
- Ms. Stephanie Sanzone

Management Assistants

- Ms. Dorothy Clark
- Ms. Wanda Fields
- Ms. Diana Pozun
- Ms. Mary Winston

II - Staff Committee Alignment

Executive Committee

Chair:	Dr. Joan Daisey
Designated Federal Officer:	Dr. Donald G. Barnes
Program Specialist:	Ms. Priscilla Tillery-Gadson

Integrated Risk Steering Subcommittee of the Executive Committee

Chair:	Dr. Joan Daisey
Designated Federal Officers:	Ms. Stephanie Sanzone
	Mr. Tom Miller
Management Assistant:	Ms. Wanda Fields

Advisory Council on Clean Air Compliance Analysis

Chair:	Dr. Maureen Cropper
Designated Federal Officer:	Dr. K. Jack Kooyoomjian
Management Assistant:	Ms. Diana Pozun

Clean Air Scientific Advisory Committee

Chair:	Dr. Joe Mauderly
Designated Federal Officer:	Mr. Robert Flaak
Management Assistant:	Ms. Dorothy Clark
	Ms. Diana Pozun

Drinking Water Committee

Chair:	Dr. Richard Bull
Designated Federal Officer:	Mr. Thomas Miller
Management Assistant:	Ms. Mary Winston
	Ms. Dorothy Clark

Ecological Processes and Effects Committee

Chair:	Dr. Mark Harwell
Designated Federal Officer:	Ms. Stephanie Sanzone
Staff Secretary:	Ms. Wanda Fields
	Ms. Mary Winston

Environmental Economics Advisory Committee

Chair:	Dr. Robert Stavins
Designated Federal Officer:	Mr. Thomas Miller
Management Assistant:	Ms. Diana Pozun
	Ms. Dorothy Clark

Environmental Engineering Committee

Chair:	Dr. Hilary Inyang
Designated Federal Officer:	Mrs. Kathleen Conway
Management Assistant:	Ms. Dorothy Clark
	Ms. Mary Winston

Environmental Health Committee

Chair:	Dr. Emil Pfitzer
Co-Chair:	Dr. Mark Utell
Designated Federal Officers:	Ms. Roslyn Edson
	Mr. Samuel Rondberg
Management Assistant:	Ms. Mary Winston
	Ms. Wanda Fields

Integrated Human Exposure Committee

Chair:	Dr. Henry Anderson
Designated Federal Officer:	Ms. Roslyn Edson
Co-Designated Federal Officer:	Dr. Dorothy Canter
	(Disproportionate Impact Review)
Management Assistant:	Ms. Mary Winston
	Ms. Wanda Fields

Radiation Advisory Committee

Chair:	Dr. Stephen Brown
Designated Federal Officer:	Dr. K. Jack Kooyoomjian
Management Assistant:	Ms. Diana Pozun

Research Strategies Advisory Committee

Chair:	Dr. W. Randall Seeker
Designated Federal Officers:	Mr. Robert Flaak
	Ms. Stephanie Sanzone
Management Assitant:	Ms. Dorothy Clark
	Ms. Mary Winston

APPENDIX E - SAB MEETINGS FOR FY98

Key to Committees of the Science Advisory Board

COUNCIL	Advisory Council on Clean Air Compliance Analysis
AQMS	Air Quality Modeling Subcommittee
HEES	Health and Ecological Effects Subcommittee
CASAC	Clean Air Scientific Advisory Committee
DWC	Drinking Water Committee
EC	Executive Committee
EEAC	Environmental Economics Advisory Committee
EEC	Environmental Engineering Committee
EHC	Environmental Health Committee
EPEC	Ecological Processes and Effects Committee
IHEC	Integrated Human Exposure Committee
IRP	Integrated Risk Project
EAS	Economic Analysis Subcommittee
ERS	Ecological Risk Subcommittee
HEHS	Human Exposure and Health Subcommittee
RROS	Risk Reduction Options Subcommittee
SC	Steering Committee
VS	Valuation Subcommittee
RAC	Radiation Advisory Committee
RSAC	Research Strategies Advisory Committee

Note: Meetings listed in **bold are face to face** meetings, *and italics are teleconference calls.* All meetings in Washington, DC unless otherwise noted.

1st Quarter

November 18-19	**RAC**	**Environmental Radiation Ambient Monitoring System and Disposal of Fed. low-activity radioactive wastes**
November 20	**RAC Subc**	**Uncertainty Analysis**
December 4-5	**DWC**	**Disinfection Byproducts, Draft Preliminary Candidate List and Various Briefings**
December 15	**CASAC**	**Particualte Matter, NAAQS Development Plan and Upcoming NAAQS (RTP, NC)**
December 16	**RSAC**	**ORD Budget Process Briefing**
December 18	*EC*	*Executive Committee Meeting*

2nd Quarter

January 13-14	**EC**	**Executive Committee Meeting**
January 23-24	**COUNCIL/AQMS**	**Prospective Study**
January 29-30	**COUNCIL/HEES**	**Prospective Study**
February 5-6	**COUNCIL**	**Prospective Study**
February 5-6	**EEC**	**Planning Meeting**
February 26-27	**RSAC**	**Review of ORD Budget**
March 3	**RAC**	**ERAMS II, High Radon Areas and Federal Guidance 13**
March 4	**RAC Subcomm.**	**Uncertainty Analysis**
March 24-25	**EPEC**	**Blackstone River Initiative (Boston, MA)**
March 31	*EC*	*Review Meeting*

3rd Quarter

April 9	**EEAC**	**Planning Meeting**
April 13-14	**EC/IRP-SC**	**Steering Committee**
April 15-16	**EC**	**Executive Committee Meeting**
April 27-29	**EEC**	**Quality Management Review**
April 30- May 1	**EHC**	**1,3 Butadiene**
May 5	**CASAC**	**PM NAAQS Development Plan (RTP, NC)**
May 5-6	**SAB/SAP**	**Endocrine Disruptors**
May 5-6	**EC Subcomm.**	**TRIM and Agency Modeling**
May 5-6	**CASAC**	**Diesel Health Assessment (RTP, NC)**
May 7-8	**RAC**	**Federal Guidance 13**
May 14	*EPEC*	*Planning*
June 2	*RAC*	*Federal Guidance 13*
June 9-10	**EHC**	**RfC Methods and Acute Reference Exposure Methods (RTP, NC)**
June 18-19	**DWC**	**Research Tracking, Drinking Water Contamination, DW Intake, Technologies for Small Systems, and Alternate Test Systems**
June 24	*EC*	*Review Meeting*

4th Quarter

July 8-9	**EC**	**Executive Committee Meeting**
July 9-10	**EPEC**	**Strategic Planning and TEF for Wildlife and Ecorisk Guidance**
July 21	**EEC**	**Quality Management**

July 22-23	**RAC**	**Cancer Risks, Radon Risk and BIER 6**
July 22-24	**EEC**	**Various Breifings andinternal initiatives**
July 30	**EC Subcomm.**	**Secondary Data Use**
July31	**RSAC**	**Budget Process**
August 3	**EC Subcomm.**	**Residual Risk (RTP, NC)**
August 14	**EEC Subcomm.**	**Retropspective Issues (Lowell, MA)**
August 19	**EEAC**	**Economic Analysis Guidelines**
August 25-26	**EC Subcomm.**	**CORMIX Model**
August 27	*EC*	*Review Meeting*
August 27-28	**EC Subcomm.**	**FY97 STAA Review**
September 3-4	**IHEC**	**Disproportionate Impact**
September 8-9	**EHC**	**Lead 403 Rule**
September 11	*RAC*	*Federal Guidance 13 and Uncertainty in Radiogenic Risk*
September 11	*EC*	*Review Meeting*
September 18	**EC Subcomm.**	**Strategic Ranking Criteria**
September 22-24	**EEC**	**Quality Management Review**
September 29-30	**IHEC**	**NHEXAS and NHANES (RTP, NC)**

APPENDIX F
SCIENCE ADVISORY BOARD FY98 REPORTS AND ABSTRACTS

F1 List of SAB Reports, Letters, Advisories, Commentaries and Consultations for FY98

FULL REPORTS

EPA-SAB-EHC-98-001	EPA Draft Mercury Report to Congress
EPA-SAB-98-002	FY 97 Annual Staff Report
EPA-SAB-EPEC-98-003	Ecological Impacts and Evaluation Criteria for the Use of Structures in Marsh Management
EPA-SAB-IHEC-98-004	Review of the Source Ranking Database
EPA-SAB-EEC-98-005	Review of the Waste Research Strategy of the Office of Research and Development
EPA-SAB-RSAC-98-006	Review of the FY 1999 Presidential Budget Request for the Office of Research and Development
EPA-SAB-EEC-98-007	Review of the Toxics Release Inventory (TRI) Relative Risk-Based Environmental Indicators Methodology
EPA-SAB-EEC-98-008	Review of ORD's Pollution Prevention Research Strategy
EPA-SAB-EEC-98-009	Review of the Office of Solid Waste's Proposed Surface Impoundment Study
EPA-SAB-98-010	Science Advisory Board 1997 Strategic Plan
EPA-SAB-EPEC-98-011	Evaluation of the Blackstone River Initiative
EPA-SAB-EC-98-012	Recommendations on the 1997 Scientific and Technological Achievement Award (STAA) Nominations
EPA-SAB-EC-98-013	Review of the USEPA's Report to Congress on Residual Risk

LETTER REPORTS

EPA-SAB-EPEC-LTR-98-001	Review of EPA's Draft Ecological Research Strategy
EPA-SAB-CASAC-LTR-98-002	Review of Project Work Plan for Particulate Matter Criteria Document
EPA-SAB-EEC-LTR-98-003	Review of the Agency-wide Quality Management Program

ADVISORIES

EPA-SAB-RAC-ADV-98-001	Advisory on Environmental Radiation Ambient

Monitoring System (ERAMS) II	
EPA-SAB-COUNCIL-ADV-98-002	Clean Air Section 812 Prospective Study of Costs and Benefits Air Quality Models & Emissions Estimates Initial Studies
EPA-SAB-COUNCIL-ADV-98-003	Overview of Air Quality and Emissions Estimates Modeling, Health and Ecological Valuation Issues Initial Studies
EPA-SAB-DWC-ADV-98-004	Advisory on the National Drinking Water Contaminant Database
EPA-SAB-EEAC-ADV-98-005	Advisory on Economic Research Topics and Priorities

COMMENTARIES

EPA-SAB-IHEC-COM-98-001	Integrated Human Exposure Committee Commentary on Indoor Air Strategy
EPA-SAB-RSAC-COM-98-002	Process for SAB's Review of the ORD Presidential Budget Request

CONSULTATIONS

EPA-SAB-RAC-CON-98-001	Consultation on Alternative Approaches for Disposal of Federal Low-Activity Radioactive Wastes
EPA-SAB-EC-CON-98-002	Notification of a Consultation on Screening and Testing of Endocrine Disruptors
EPA-SAB-EC-CON-98-003	Notification of a Consultation on Environmental Computer Models
EPA-SAB-DWC-CON-98-004	Notification of a Consultation on Alternative Test Systems for the Evaluation of Disinfection By-Product Mixtures
EPA-SAB-DWC-CON-98-005	Notification of a Consultation on a Method for Estimating Drinking Water Intake Levels
EPA-SAB-RSAC-CON-98-006	Notification of a Consultation on the Agency's FY2000 Science and Technology (S&T) Budget
EPA-SAB-EPEC-CON-98-007	Notification of a Consultation on Possible Further Guidance on Ecological Risk Assessment Topics
EPA-SAB-EPEC-CON-98-008	Notification of a Consultation on the Use of Toxic Equivalency Factors (TEFs) in Ecological Risk Assessments
EPA-SAB-EC-CON-98-009	Notification of a Consultation on Ranking Criteria for Strategic Planning and Budgeting

F2 Abstracts of SAB Reports, Advisories, and Commentaries for FY 1998

FULL REPORTS

EPA-SAB-EHC-98-001 — EPA Draft Mercury Report to Congress

In response to the 1990 Clean Air Act Amendment's directive, the EPA developed a draft report on mercury, and asked the Science Advisory Board to review it. The Mercury Review Subcommittee convened on February 13-14, 1997 in Washington, DC.

The Subcommittee believes that the major findings of the draft report are well supported by the scientific evidence. There are areas where improvement in the use of available scientific information is possible. Detailed suggestions for such improvements are noted below:

a) The majority of the human population is not experiencing methylmercury exposures that are of concern from the standpoint of human health. The current Reference Dose, based on the Iraqi and New Zealand data, should be retained at least until the on-going Faeroe and Seychelles Islands studies have progressed much further and been subjected to the same scrutiny as has the Iraqi data.

b) The Subcommittee identified some problems *vis-a-vis* human health issues - a lack of recognition and emphasis on consistency of the animal data across multiple studies.

c) It is plausible that current anthropogenic emissions are contributing to human exposures, and that fish are the major source of methylmercury exposures for the human population.

d) The Subcommittee recommends that the cost analysis also give consideration to other approaches for controlling mercury emissions that might prove to be more flexible and more cost-effective.

e) The mercury wildlife criterion is overly conservative and is lower than appears necessary to protect wildlife species. However, piscivorous wildlife are at risk from elevated mercury exposures.

f) Volume V, in total, is not based on the best available and sound science.

g) The final document should emphasize the fact that there are significant information gaps in the understanding of the biogeochemistry of mercury species.

h) The modeling of atmospheric mercury transport and deposition is largely sound, but the modeling of the post-deposition fate of mercury in ecosystems does not reflect recent advances in the science.

EPA-SAB-98-002 — Science Advisory Board FY 1997 Annual Staff Report: Extending Our Range

The Science Advisory Board Staff's annual report captures the SAB's activities for FY 1997.

EPA-SAB-EPEC-98-003 — Ecological Impacts and Evaluation Criteria for the Use of Structures in Marsh Management

The Marsh Management Subcommittee of the Science Advisory Board's Ecological Processes and Effects Committee reviewed the state of the science for structural marsh management (SMM). The Agency requested this review in support of their plans to develop an interim Agency position on SMM, with a long-term

goal of developing a national marsh management policy. The Subcommittee used the term "structural marsh management" to distinguish this fairly narrow set of management approaches from the broader set of practices that are commonly associated with the term marsh management. The Agency's definition for marsh management is "the use of structures (such as canal plugs, weirs, gates, culverts, levees and spoil banks) to manipulate local hydrology in coastal marshes." The Agency specified in the Charge for the Subcommittee to include in its review wetlands influenced by the tide, and lands and waters associated with the Great Lakes.

The Subcommittee found that the collective experience on SMM around the country has shown that unintended, unanticipated, and sometimes undesirable effects have often resulted from structural management of marsh hydrology. The Subcommittee found it difficult to generalize about the ecological impacts of SMM because of differences in the physical environment, status of wetland resources, or management objectives in different wetland areas. The Subcommittee recommends that the application of a marsh management policy should be done at least at the region-specific, ecosystem-specific, or basin-specific level. The Subcommittee urges caution in the adoption or approval of SMM projects in order to avoid counterproductive results on the long-term sustainability of imperiled tidal and Great Lakes wetlands. The Subcommittee also recommends that Agency decisions regarding proposed SMM projects take into account the potential impacts of the project from an ecosystem, rather than single-species or single-resource, perspective.

In addition to providing a summary of the state of the science on the ecological consequences of SMM from a national perspective, the report recommends a number of scientific/technical criteria that should be used to evaluate proposed SMM projects, highlights priority monitoring and research issues, and discusses SMM issues that are relevant in various regions of the country.

EPA-SAB-IHEC-98-004 **Review of the Source Ranking Database**

The Integrated Human Exposure Committee (IHEC) reviewed the EPA's Source Ranking Database (SRD) including the assumptions and methodologies used in scoring product/material categories in order to rank them for further characterization and possible risk management attention. Given the importance of indoor environments in determining human exposures, the SRD project is a very worthwhile effort.

The SRD includes an algorithm for ranking products. This algorithm has been developed for Agency use to help identify products that are likely to pose the highest health risks. The overarching concern is that the algorithm must be sufficiently robust so that products are not misranked. For example, the Committee was concerned that a product that should be ranked "high" is not missed due to some underlying problems with the algorithm. Several components of the algorithm may lead to this problem such as: a) use of the volume of the whole house rather than a room and or "breathing zone" volume for products used by individuals; b) omission of dermal and certain inadvertent ingestion exposures; and c) the overall sensitivity of the algorithm to variabilities in the component factors, and in the hazard scale in particular. The Committee recommends that the Agency address: a) and c) immediately, and makes some specific recommendations with respect to how to proceed. The IHEC also suggests a simplified method for screening and ranking products with respect to dermal exposures that could be used immediately.

The IHEC makes several additional recommendations including: a) The Agency should add several additional exposure sources to the SRD, including indoor combustion sources and the criteria air pollutants that are emitted by such sources. Future expansions should include dermal and inadvertent ingestion exposures, as well as inclusion of analyses of potential exposures of special populations such as children, the elderly, asthmatics and those with chronic obstructive pulmonary disease (COPD), b) The Agency should add the octanol/water partition coefficient and Henry's Law ratio as part of the database so that sorption/desorption and

volatilization processes can be better addressed, and c) the Agency should consider whether the database will be regularly updated and whether the database will be made accessible to the public.

EPA-SAB-EEC-98-005

Review of the Waste Research Strategy of the Office of Research and Development

The Environmental Engineering Committee of the EPA Science Advisory Board reviewed the Waste Research Strategy prepared by the EPA Office of Research and Development. The Committee commends EPA for developing the Strategy, which responds to previous SAB advice (EPA-SAB-EEC-COM-94-004) and decisions (EPA-SAB-EEC-97-011). The Committee also commends ORD for adopting risk reduction as the cornerstone of the Strategy. If this approach is implemented properly, the effectiveness and impact of ORD's research programs will improve significantly. The Committee finds the Strategy has strengths and opportunities for improvement. In general, implementation of the Strategy is likely to improve the EPA's capacity to address waste management problems and reduce risks to human health and the environment.

The Committee now recommends two advancements to the process of research strategy development – the involvement of external organizations in the planning process and transparent documentation.

Establishing and documenting linkages between the ORD waste research strategy and related efforts within and outside the Agency, will strengthen the strategy. Such description indicates the authors know the field and it reduces the likelihood that efforts will be duplicated or important issues neglected. Examples of such organizations are Risk-Based Corrective Action (RBCA); programs operated by state agencies concerned with environmental protection; the waste management programs of the Department of Energy; and natural hazards mitigation programs of the Federal Emergency Management Agency (FEMA), U.S. Geological Surveys of the National Institute for Standards and Technology (NIST).

The final Strategy should describe how and why specific research topics were assigned various priority levels so clearly that a stranger to the process could pick up the Strategy and understand how each decision was made.

EPA-SAB-RSAC-98-006

Review of the FY 1999 Presidential Budget Request for the Office of Research and Development

On February 26-27, 1998, the Research Strategies Advisory Committee (RSAC) of the Science Advisory Board (SAB) met to review the FY1999 Presidential Budget Request for the Office of Research and Development (ORD). The Committee considered how well the proposed budget request: a) reflected priorities identified in the EPA and ORD Strategic Plans; b) supported a reasonable balance between core research on multimedia capabilities/issues and media-specific problem-driven topics; c) balanced near-term and long-term research issues; d) had sufficient resources to achieve the objectives of the research and development program; and e) how ORD can improve upon the Government Performance and Results Act (GPRA) structure to communicate research plans, priorities, research requirements, and planned outcomes.

The Committee noted that the FY1999 ORD and EPA budgets are the first goals-based research budgets put forth by the Agency. The budget represented a concerted effort on the part of the ORD to develop the

requested funding allocations around the ORD Strategic Plan. The plan and budget were developed in concert with the program offices to develop goals consistent with customer needs. For the first time it is possible to examine and evaluate how the money is allocated to various programs, to science and technology activities and to various strategic goals.

While pleased with the presentation of the budget, RSAC was disturbed to note that the research budget is declining when viewed as percentage of the overall Agency budget, as well as in real purchasing power. In particular, the Committee concluded that the budgets proposed in several areas were not likely to be sufficient to meet the goals established by the Agency and ORD in their Strategic Plans. These areas included particulate matter, endocrine disruptors, ecosystem protection, global climate change, waste site remediation technologies, microbial pathogens and indoor air.

EPA-SAB-EEC-98-007

Review of Toxic Release Inventory (TRI) Relative Risk-Based Environmental Indicators Methodology

The Science Advisory Board (SAB) assessed the technical merits of the Toxics Release Inventory (TRI) Relative Risk-Based Environmental Indicator methodology developed by the Office of Pollution Prevention and Toxics (OPPT). The methodology employs the same toxicity weighting for chemical releases as the Sector Facility Indexing Project previously reviewed by the SAB (EPA-SAB-EEC-97-012). The TRI Relative Risk-Based Environmental Indicator methodology also considers fate, transport, and the exposed population.

The methodology's consideration of exposure and populations in its estimation of risk is an improvement over estimates based solely on the mass of annual releases or solely on toxicity-weighted releases.

To improve the methodology, the Subcommittee recommends that the methodology: a) use actual, rather than binned, toxicity values; b) more appropriate exposure models be used with region-specific data (and, when available, site-specific data); and b) use actual population numbers rather than rural population default value of 1000.

The Subcommittee recommends that the EPA subject the TRI methodology to sensitivity and uncertainty analyses and portray uncertainty in the final results. This will allow potential users the ability to use the output with the proper confidence.

EPA-SAB-EEC-98-008

Review of ORD's Pollution Prevention Research Strategy

At the request of the Office of Research and Development (ORD), the Environmental Engineering Committee (EEC) of the Science Advisory Board (SAB) reviewed the draft *Pollution Prevention Research Strategy*.

In general, implementation of the strategy is likely to produce results that will improve the Agency's capacity in pollution prevention and reduce risks to human health and the environment. The vision and mission statements for the research strategy effectively capture the appropriate role of the ORD in pollution prevention and also recognize the importance of making pollution prevention precepts and tools useful to society. The strategic rationale for the ORD's program provides a clear basis for delineating research priorities.

The programs and projects highlighted in the draft strategy are reasonable and largely justifiable. The long-term goals developed for the research strategy are consistent with the mission statement. Thus, if the long-term goals are thoroughly executed, significant advances toward the stated vision will occur.

The strategy could be strengthened by documenting the decision process as well as the product of those decisions, including the translation of long-term goals into specific projects. Such documentation could improve the transparency of the process, especially to stakeholders whose support the Agency needs to ensure the implementation of effective pollution prevention programs which we expect will result from the developed research strategy.

EPA-SAB-EEC-98-009 **Review of the Office of Solid Waste's Proposed Surface Impoundment Study**

The Surface Impoundments Subcommittee of the Science Advisory Board's Environmental Engineering Committee reviewed the proposed methodology for the Office of Solid Waste's Congressionally required surface impoundments study. In summary, the charge for this review was to comment on: a) the technical merits of the overall study structure; b) the technical merits of the proposed risk assessment; and c) the involvement of outside technical experts, affected facilities and the general public at critical points in the study's design and implementation.

The Subcommittee reviewed the Agency's plans for conducting the congressionally mandated study to characterize risks from industrial waste waters managed in non-hazardous surface impoundments. Since this SAB review occurred at an early stage of the study, many of the comments and recommendations are offered to assist the Agency in making scientifically sound decisions in designing and implementing this study.

In general, the Subcommittee finds that the Agency's approach to conducting the study in a phased manner is appropriate and a pilot study is recommended. The use of existing data early in this study will help the Agency in prioritizing and allocating resources to obtain supplemental data from potentially high risk sites. There are, unavoidably, uncertainties in the choice of multimedia models for risk analysis.

The Subcommittee is pleased with the Agency's inclusion of ecological risk assessment and endorses the case study approach. In addition, the Subcommittee is very supportive of conducting peer reviews throughout the study. Finally an SAB review at the end of 1999 is also recommended.

EPA-SAB-98-010 **Science Advisory Board 1997 Strategic Plan**

The approaches to environmental protection at EPA are changing and to be most effective the SAB needs to change with them. Specifically, the SAB needs to spend much more of its total energies on providing strategic, forward looking advice, while maintaining and even improving the quality, utility, and timeliness of its activities focussed on Agency-requested peer review of EPA products.

EPA and environmental decision making in general have undergone rapid change in recent years, providing new opportunities for the SAB to enhance the quality of science in environmental decision making, or, in some cases, requiring that the SAB also change in order to continue being successful. The changes in EPA and environmental decision making which are particularly relevant to the SAB's mission include new less centralized decision making approaches, emerging scientific issues, crosscutting initiatives and programs,

multiple avenues for peer review, an expanded EPA grants program and international dimensions of emerging environmental problems.

The SAB intends to make changes along several lines simultaneously:

a) The SAB will improve general operations. This includes making several operational changes to improve timeliness, such as expedited report writing, greater attention to project selection, and a new "fast track" process for a few special cases. The Executive Committee will also institute new ways to ensure that the SAB is accepting the right projects for peer-review. In addition, the SAB will take concrete steps to improve communication with customers, other organizations and with new SAB members and Chairs.

b) The SAB will redirect, develop or modify some specific SAB elements. This includes directing the Research Strategies Advisory committee to focus on the broad strategic aspects of research and science in the Agency; integrating economics expertise into the broader work of the Board; and a number of other specific activities.

c) And finally, the SAB will begin some new initiatives to meet the challenge of the Agency's own changes in environmental decision making. The SAB will institute a process for selecting a few strategic projects each year. These will focus on broad issues such as the role of science in "next generation" approaches to environmental protection. The SAB will also develop or contribute to the development of workshops to address important, under-recognized scientific issues; explore a broader range of social science involvement in SAB activities; experiment with short summaries of its reports for non-technical audiences; and consider a focus on international environmental issues.

The Strategic plan will be used as a guide for SAB operations over the next several years. If successful, the plan will result in more timely, balanced, relevant and useful SAB products and, most importantly, enable the SAB to have a greater positive impact on how EPA does science and uses science in protecting the environment.

EPA-SAB-EPEC-98-011 **Evaluation of the Blackstone River Initiative**

At the request of Region I Administrator John DeVillars, the Ecological Processes and Effects Committee (EPEC) of the EPA Science Advisory Board (SAB) met on March 24-25, 1998 in Boston, MA to review the Blackstone River Initiative (BRI). The BRI is an inter-agency, inter-state project to monitor and model water and sediment quality in the Blackstone River in Massachusetts and Rhode Island. The river is an important natural resource that has experienced the effects of industrial and sewage treatment plant effluents, runoff from urbanized areas, and damming for hydropower. The river has also been identified as a major source of metals and nutrients to Narragansett Bay. Although the SAB rarely conducts regional reviews, the BRI presented an opportunity for the Committee to assist a Regional office with peer review and to encourage Regional adoption of integrated watershed assessment approaches.

The BRI study was designed to assess the influence of wet weather flows on baseline water quality conditions in the Blackstone River. This was accomplished with field monitoring to assess conditions during storm events and during dry weather (base flow) conditions, and modeling of dissolved oxygen, suspended solids, and metals. The BRI also included toxicity bioassays using effluent and sediment samples and some limited biological assessments with fish and macroinvertebrate species. In addition, a more detailed study of

water column and sediment contaminants was conducted for one of the impoundments along the river (Rice City Pond) in order to develop possible remedial actions.

The Committee concluded that the BRI study represents a significant advance for the Agency as an initial attempt to integrate multi-agency, multi-scale, and multi-environmental stressor considerations. The effort to characterize both "dry" and "wet" conditions was important in showing that different processes govern pollution input, transport, and fate in this system during different weather patterns. This has important implications, for example, for management of the system and for the calculation of loadings to Narragansett Bay. However, the Committee noted a number of deficiencies in the study that, while apparently due to budgetary limitations, limit the conclusions that can be drawn from the study. The Committee, therefore, strongly urges Region I and the other participants in the BRI to initiate a subsequent phase of the project to take the needed broader look at the ecological condition of the river and the watershed. Recommended components of a subsequent phase of the BRI include incorporation of the ecological risk assessment framework, limited additional monitoring, inclusion of biological information and land-use/land-cover data for the watershed, use of Geographic Information System (GIS) analysis of the data, and the use of more appropriate existing models for watershed-level analysis.

EPA-SAB-EC-98-012

Recommendations on the 1997 Scientific and Technological Achievement Award (STAA) Nominations

This report represents the conclusions and recommendations of the U.S. Environmental Protection Agency's Science Advisory Board regarding the 1997 EPA Scientific and Technological Achievement Awards (STAA) program. The STAA Program is an Agency-wide competition to promote and recognize scientific and technological achievements by EPA employees, fostering a greater exposure of EPA research to the public. The Program was initiated in 1980 and is managed by the Office of Research and Development (ORD).

The Agency submitted for review 106 nominations from the first eight of the eleven award categories this year (Control Systems & Technology, Ecology & Ecosystem Risk Assessment, Health Effects & Health Risk Assessment, Monitoring & Measurement Methods, Transport & Fate, Review Articles, Risk Management and Policy Formulation, Integrated Risk Management, Social Science Research, Environmental Education, and Environmental Trends for Drivers of Future Risk). After review, the STAA Subcommittee of the Science Advisory Board revised the number of nominations to 104. These nominations contained over 125 scientific and technical papers. Of these, the Subcommittee recommended 35 nominations (34 percent of the nominations) for awards at three levels and also recommended that nineteen additional papers be recognized with Honorable Mention. The Subcommittee recommended awards for nominations submitted by 11 ORD research laboratories. The Subcommittee encouraged the Agency to continue support for the STAA program as a mechanism for recognizing and promoting high quality research in support of the Agency's mission.

EPA-SAB-EC-98-013

Review of the USEPA's Report to Congress on Residual Risk

The Residual Risk Subcommittee of the Science Advisory Board's (SAB) Executive Committee convened in public session on August 3, 1998 to review the U.S. Environmental Protection Agency's draft Residual Risk Report to Congress (Report). The Report describes the strategy methods the Agency will use to assess the risk

remaining, (i.e., the residual risk) after maximum achievable control technology (MACT) standards, applicable to emissions sources of hazardous air pollutants (HAPs), have been promulgated under Section 112(d).

In short, the SAB found the Report to be a generally good draft of a strategy document, but one that must be strengthened in a number of important places prior to submission to Congress. The Subcommittee was highly supportive of the Agency's coming back to the SAB in 1999 with examples in which the Report's strategy is used in specific cases.

The SAB endorses the underlying the risk assessment (RA)/risk management (RM) approach described in the Report At the same time, there are additional points that should be confronted more directly and explicitly, including the following: a) The Report should more carefully convey the limitations of the data, models, and methods that are described or that would be needed to carry out the residual risk assessment activities; b) The Report should contain or cite specific examples to clarify what some of the bold, but vague, language is intended to convey; c) There needs to be a more clearly described screening approach that will prioritize stressors for assessment and will husband Agency resources; and d) The Report should be more explicit about how the residual risk assessments will be used to make risk management decisions.

The SAB report contains many other specific comments, as well as an appendix containing written comments from individual members.

LETTER REPORTS

EPA-SAB-EPEC-LTR-98-001 — Review of EPA's Draft Ecological Research Strategy

The Science Advisory Board's (SAB) Ecological Processes and Effects Committee (EPEC) met on July 21-22, 1997 to review the EPA's draft Ecological Research Strategy. EPEC complimented the Office for Research and Development (ORD) for undertaking this comprehensive, long-term planning exercise. EPEC found the strategic plan to be essential for proactive operation, priority setting, and resource allocation for ORD, as well as for coordinating efforts across the Agency.

The Committee made several recommendations for areas that were identified as needing improvement. These recommendations include:

a) Strategic planning efforts for the Ecological Research Strategy should be consistently and regularly conducted. It may be appropriate to subject major plan changes to external review.

b) The definition of ecological integrity should be refined, as described in the report, to state clearly that both scientific criteria and societal values contribute to establishing the best attainable condition of an ecosystem.

c) The future flow charts should be redrawn to show clearly the important role of early and multiple places for stakeholder involvement.

d) Specific recommendations are provided on refining the concepts and methodologies for multi-stressor, multiple levels of biological organization, and multiple-scale research. The Committee encourages the use of real-world case studies, not abstract exercises, as the focal point for testing and refining these concepts and methodologies.

e) The bulleted descriptions of the four core research areas should be replaced with scientific questions listed in the report.

f) *Reducing Risk* (SAB, 1990) should be examined and the recommendations from the SAB's upcoming Integrated Risk Project (IRP) should be incorporated into the strategy.

g) Other Federal agencies should be canvassed to identify possible gaps in ecological research that are not being covered adequately by any Federal agency.

h) A diversity of ways to strengthen the collaboration between ORD scientists and extramural scientists should be explored.

EPA-SAB-CASAC-LTR-98-002 **Review of Project Work Plan for Particulate Matter Criteria Document**

The Clean Air Scientific Advisory Committee (CASAC) met on May 5, 1998 to review the *Project Work Plan For Preparation of Revised U.S. EPA Air Quality Criteria for Particulate Matter (2000)*, developed by the National Center for Environmental Assessment (NCEA) in Research Triangle Park, NC. This work plan describes the general approach and schedule NCEA proposes to follow in developing the criteria document for the next review of the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM).

The Committee agreed with the general organization of the document into the nine chapters specified in the plan, and engaged with staff in a productive discussion of subtopics within the chapters. The Committee also was pleased with NCEA staff's proposal for taking a new approach in their development of the next PM criteria document. Stated in general terms, this approach will produce a document which builds on previous knowledge, but avoids recapitulating in a comprehensive manner the information contained in previous criteria documents.

EPA-SAB-EEC-LTR-98-003 **Review of the Agency-wide Quality Management Program**

This letter report addresses policy, organization, requirements, and guidance for EPA's quality management system. A separate report will address implementation of the Quality System. The system encourages EPA to collect and use environmental data of the type, quality, and quantity needed for decision-making. The Quality Assurance Division (QAD) serves as the central management authority for the Agency's Quality System.

EPA's Quality Assurance Division (QAD) is knowledgeable. QAD has updated EPA's policy on quality; generated widely accepted project-level guidance and requirements; promoted quality in the data collection process through outreach and training; and used peer-reviews to strengthen guidance and requirement documents.

The following recommendations address both science and policy. The recommendations touching on policy are worthy of consideration because they follow closely and logically from the science, are in accordance with quality management as practiced in other organizations, and influence the efficacy of the Quality System. The recommendations are: (a) the Quality System should address all activities affecting the quality of the Agency's products and services; (b) EPA should reconsider the reporting status of the Quality System function; (c) EPA needs an Agency-wide focal point for corrective actions relating to quality; (d) senior management should be trained about the Quality System; (e) EPA needs to identify metrics for benchmarking the quality program and for determining changes over time; (f) EPA needs guidance on models and the associated data; and (g) EPA should evaluate whether current resources assigned to quality are sufficient.

ADVISORIES

EPA-SAB-RAC-ADV-98-001 — Advisory on EnvironmentalRadiation Ambient Monitoring System (ERAMS) II

The EPA Science Advisory Board's (SAB) Radiation Advisory Committee (RAC) reviewed technical aspects of the draft document titled Reconfiguration Design for the Environmental Radiation Ambient Monitoring System (ERAMS). The reviewed document was developed by the staff of the Office of Radiation and Indoor Air (ORIA), with lead responsibility by the staff of the National Air and Radiation Environmental Laboratory (NAREL), Office of Air and Radiation (OAR), Montgomery, Alabama. The charge to the RAC for this advisory was to assess the Agency's proposals for reconfiguring the ERAMS program and to respond to specific questions related to the effort regarding the reconfiguration design, the criteria used for matrix selection, determination of sampling locations and frequency, other network features, whether proposed changes will increase overall system usefulness to all the parties, and whether there are other issues or practices that should be addressed.

The RAC found that the proposed reconfiguration is an appropriate, well organized, well-written, and well thought-out planning document. The Committee recommendations call for elaborations at a greater level of detail, a more effective statement of the mission and objectives, improvements needed to guide emergency response actions, better elaboration on use of radiation data from other routine monitoring networks, improvements in the rationale and approach to sampling choices, such as use of a Data Quality Objective (DQO) rationale in determining such factors as the number, locations and frequency of sampling locations, as well as periodic re-evaluation of design.

EPA-SAB-COUNCIL-ADV-98-002 — Review of Project Work Plan for Particulate Matter Criteria Document

The Science Advisory Board's Air Quality Models Subcommittee (AQMS) of the Council, has reviewed precursors to the first Prospective Study: Report to Congress. Overall, the AQMS concludes that the strategy of using model results and observations is found to be an appropriate, sound approach for the current prospective study, but needs to be described more clearly and concisely.

For future prospective studies, the AQMS suggests that the study team consider use of the more comprehensive modeling platform of EPA's Models-3 platform which would make it possible to have a more consistent analysis of areas throughout the U.S.. In addition, the AQMS also suggests use of more advanced interpolation schemes. Finally, the AQMS strongly advises development and use of a more flexible and user-friendly emissions modeling system that provides the ability to better diagnose data problems and more easily examine multiple scenarios.

The Subcommittee's most serious concern involves the predictions for particulate matter (both PM_{10} and PM_{25}) . Recently, a downward trend has been observed in the concentration of airborne particulate matter. In contrast, the current prospective study pre-CAAA90 scenario results shows an average increase in PM and the post-CAAA90 scenario shows a decrease significantly less than the decrease already observed during the initial 5 years of the prospective study I analysis period. . The AQMS suggests several strategies that might help address this issue and strongly advises that this discrepancy in predicted and observed trends be understood or resolved first before conducting any new scenario runs in the current prospective study.

EPA-SAB-COUNCIL-ADV-98-003

Overview of Air Quality and Emissions Estimates Modeling, Health and Ecological Valuation Issues Initial Studies

The Advisory Council on Clean Air Compliance Analysis ("the Council")has reviewed various issues and initial studies related to the Prospective Study of Benefits and Costs of the 1990 Clean Air Act Amendments. This report discusses four important issues concerning the development of the EPA's first Prospective Study :Scope and Objectives of the Study; Measurement of Costs; Measurement and Valuation of Ecological Benefits; and Measurement and Valuation of Health and Welfare Benefits.

The Council generally agrees with the goals of the Prospective Study, and believes that it should place future air pollution control legislative efforts on a more sound economic footing. Addressing the scope of the study, the Council has urged in previous advice that analysis of benefits and costs be disaggregated whenever possible by title, or supplementing the aggregate analysis by studying additional pollution controls beyond the 1990 CAAA. The Council believes that for the purposes of informing future legislation, it would be more useful to analyze additional controls beyond the 1990 amendments.

In general, the Council agrees with the Agency's estimates of the direct costs of complying with the various titles of the 1990 CAAA. It is important to discuss the degree of uncertainty in the various costs estimates and, when possible, to show the sensitivity of cost estimates to underlying assumptions. The Prospective Study credibility will be greatly enhanced if the cost estimates are accompanied by a discussion of the modeling options available, some rationale for the options chosen, and a sense of which are the key assumptions that, if changed, would generate the largest change in the cost estimates.

The Council encourages the Agency to work with ecologists to better define and measure the broader ecosystem benefits of air pollution control beyond the commercial service flows generated by ecosystems. The Council encourages the Agency to acknowledge the existence value of ecological improvements, despite the difficulties in accurately measuring these values using existing valuation methods. The Council suggests that the Agency refrain from using the avoided cost approach to value reduced ecosystem damages. This is because the approach does not value the damages themselves, but measures the cost of alternative ways of reducing the damages.

With regard to valuing mortality risk reductions, the Council acknowledges that no reliable empirical estimates exist of the value of shifts in survival curves. To complete the Prospective Study, the Council recommends that the same approach to valuing mortality risk reductions be used as was employed in the Retrospective Study. The Council also urges that alternative methods of valuing changes in mortality risks be discussed in an Appendix to the Prospective Study.

EPA-SAB-DWC-ADV-98-004

Advisory on the National Drinking Water Contaminant Database

The Drinking Water Committee (DWC) of the Science Advisory Board (SAB) reviewed the design phase considerations of the National Contaminant Occurrence Data Base (NCOD). Review of the NCOD was required in the 1996 Amendments to the Safe Drinking Water Act (SDWA). The review was conducted in a public session under the provisions of the Federal Advisory Committee Act (FACA). The charge to the DWC asked if the data elements included in the background information on possible database attributes categorized as Sample Test Results were adequate for scientific analyses necessary for SDWA implementation, recognizing that more

detailed data will still be stored by the laboratory? Further, the Agency asked the DWC's opinion on what types of results should be reported for peer review by the scientific community relative to regulatory decisions and how these results should be reported?

The DWC recommended that the Agency consider and clearly articulate the intended uses of this data, and the methods that will be used for data analysis and presentation, before the NCOD design is completed. This action would enable EPA scientists to more effectively identify those data elements that are essential for inclusion within the data base. The Committee also recommended that the Agency pay special attention to the collection and organization of high quality data in the future and not to invest heavily in previously collected data of less well-defined quality.

EPA-SAB-EEAC-ADV-98-005 **Advisory on Economic Research Topics and Priorities**

The Environmental Economics Advisory Committee (EEAC) of the EPA Science Advisory Board (SAB) received a briefing by representatives from EPA's Office of Research and Development (ORD) and the Office of Policy (OP) on the Agency's efforts to prepare a plan to guide its economics research. No specific charge was provided to the EEAC prior to the meeting. Rather, the SAB was asked to consider how the EEAC might help to ensure that the best possible plan could be prepared to guide EPA's economics research.

The EEAC agreed to prepare an Advisory that would contain member comments on a list of topics being considered by EPA internally as candidates for Agency-sponsored economics research. This Advisory, consisting of brief member commentaries on the 31 topic areas proposed by EPA, is the result of the EEAC discussions. In addition, the Committee's informal ranking reflecting the value it associates with each research topic is included in the Advisory.

Commentary

EPA-SAB-IHEC-COM-98-001 **Integrated Human Exposure Committee Commentary on Indoo r Air Strategy**

The Integrated Human Exposure Committee (IHEC) of the Science Advisory Board (SAB) met on July 22, 1997 for a consultation on the draft Indoor Air Strategy from the Office of Air and Radiation (OAR). The Committee expressed its support for the Agency's efforts to address the cross-cutting public health issues raised by pollutant exposures in indoor environments, particularly given that most of the population spends about 90% of its time in indoor environments and that many of the greatest environmental health risks are encountered in indoor environments. The IHEC provides specific recommendations for the EPA Indoor Air Strategy and the Human Health Indoors Policy Committee (HHIP) to achieve its goal, "to develop an Agency-wide action plan to ensure that EPA is prepared to meet the challenges of protecting human health indoors in the 21st Century." For example, the Committee recommends that the EPA expand its sources of information to include indoor air exposure data from government programs outside of the EPA. The IHEC also recommends continued EPA

efforts in the measurement of indoor contaminant concentrations and exposures given their importance in assessing risk. The Committee also expressed its support for the EPA's efforts in both the National Human Exposure Assessment Survey (NHEXAS) and the National Health and Human Nutrition Examination Survey (NHANES).

EPA-SAB-RSAC-COM-98-002 **Process for SAB's Review of the ORD Presidential Budget Request**

The Research Strategies Advisory Committee (RSAC) of the Science Advisory Board (SAB) met on July 31, 1998 to identify areas where future improvements can be made in the coordination, timing and presentation of the budget materials to the Committee and to identify means whereby the SAB could provide early advice and insights on all of the science-related aspects of the emerging FY2000 budget. The Committee had the following suggestions: a) move towards expanding the SAB review to include all activities related to science and technology in the Agency in a single annual budget review; b) include a historic perspective and illustrative figures to include an analysis of the ORD budget relative to the changing Agency needs and how this has impacted the budget request; c) include information to help the Committee better evaluate the adequacy of the funding for coordination with organizations outside of EPA; d) include an evaluation process for determining program effectiveness; e) provide more detail on how the budget is allocated to individual objectives and research programs and how this year's budget fits into the contemplated budgets over the planning horizon of the Strategic Plan (i.e., five years) and even over the longer term (10-15 years); f) improve the descriptions of how each program is expected to enhance the quality of environmental decision-making over the long-term; g) timing and presentation of budget material; h) have ORD provide a budget briefing at a meeting several months prior to the meeting at which we do the actual budget review; i) ensure timely delivery of materials so that the Committee has adequate time to react and prepare for discussions; j) focus the briefings on how the total budget compares with previous years' budgets and how resources are distributed among the budget categories; l) provide time-lines for multi-year programs, showing past budget trends and future projections; m) describe the "close-out" procedures that are used to terminate R&D and S&T activities that have been completed or that are no longer high priority in the ORD and Program Office Strategic Plans; and n) provide some perspective on contingency planning concerning how budget cuts would be made if the proposed budget is not approved and has to be revised downward.

APPENDIX G
DETAILED TIME TO COMPLETION GRAPHICAL ANALYSIS FOR FULL AND LETTER REPORTS

The Science Advisory Board is concerned that its advice be accurate, useful, and timely. Accuracy is addressed through the qualified and balanced Panels that conduct the reviews. Usefulness is measured, in part, by the degree to which the Panels complete the Charge, i.e., the list of questions that guide the review. Timeliness depends on a number of factors including the complexity of the issue, size of the SAB Panel and report, and the capacity of the SAB process (members and staff) to focus on the report.

In FY94 the SAB adopted as a measure of timeliness the length of time that transpires from the last public meeting on an issue (some issues may require more than one such meeting) until the final report is transmitted to the Administrator. This time period is referred to as "time-to-completion (TOC)". For most reports (those of the Council and CASAC being the exceptions) this time period can be divided into two segments:

Segment 1: The time from the last public meeting until approval by the Executive Committee (EC). This period is devoted to drafting the report and reaching Committee consensus on its content.

Segment 2: The time from approval by the EC until the transmission of final report to the Administrator. During this period of time, the DFO and Committee Chair address generally minor concerns raised by the Executive Committee that has formally approved the report, sometimes subject to final approval by members who are designated to vet the report on behalf of the entire EC.

In FY95 the SAB reached its self-proclaimed goal of a TOC averaging no more than six months. Hence, in keeping with the tenants of Total Quality Management (TQM), the Board announced another timeliness goal: an average TOC of no more than 4 months.

The TOC data for FY98 are displayed in Table G-1 (in text/numerical form) and Figure G-1 (in graphical form), with a clear distinction between Segment 1 and Segment 2 information. The total TOC figures are sum of Segment 1 and Segment 2.

Note that the data from the Council and CASAC consist of only a single figure; i.e., the time from the public meeting to the time of transmission to the Administrator. These two Committees are separately chartered and report directly to the Administrator, without having to past through the EC.

This year, we are continuing our efforts to improve our time to completion for SAB Reports. The full report average of time to completion falls to approximately 4.8 months. This reflects the two years from July 1996 to January 1998 required to finalize the Marsh Management Report. The time to complete letter reports was 2.9 months. We have some success stories with the expeditious completion of several of our reports including the Residual Risk Report, EPA-SAB-EC-98-013, which was completed in 58 days, the 1997 Scientific and Technological Achievement Awards Report, EPA-SAB-EC-98-012, completed in 43 days, and the FY99 Presidential Budget Request Report, EPA-SAB-RSAC-98-006, completed in 70 days.

Fiscal Year 98 Reports

Full Reports	Days/Months	Report Date	Other Dates*
EPA's Draft Mercury Report to Congress	239(7.9)	10/10/97	
EPA-SAB-EC-98-001			
Meeting	1		2/14/97
Executive Committee Approval	158		7/22/97
To Administrator	80		10/10/97
Structures in Marsh Management	546(18.2)	1/22/98	
EPA-SAB-EPEC-98-003			
Meeting	1		7/26/96
Executive Committee Approval	532		1/9/98
To Administrator	13		1/22/98
Source Ranking Database	185(6.1)	1/22/98	
EPA-SAB-IHEC-98-004			
Meeting	1		7/22/97
Executive Committee Approval	171		1/9/98
To Administrator	13		1/22/98
Waste Research Strategy	240(8.0)	2/27/98	
EPA-SAB-EEC-98-005			
Meeting	1		7/3/97
Executive Committee Approval	195		1/14/98
Administrator	44		2/27/98
FY 1999 Presidential Budget Request	61(2.0)	4/28/98	
EPA-SAB-RSAC-98-006			
Meeting	1		2/27/98
Executive Committee Approval	47		4/15/98
To Administrator	13		4/28/98
Toxics Release Inventory (TRI)	303(10.1)	4/30/98	
EPA-SAB-EEC-98-007			
Meeting	1		7/2/97
Executive Committee Approval	287		4/15/98
To Administrator	15		4/30/98

*Shows date of last public meeting, date report approved by EC, and date report was sent to the Administrator
*Note: Report Number EPA-SAB-98-002 is the present SAB Annual Report and is, therefore, excluded from this table

Full Reports (cont'd)	Days/Months	Report Date	Other Dates*
Pollution Prevention Research	365(12.1)	7/14/98	
EPA-SAB-EEC-98-008			
Meeting	1		7/3/97
Executive Committee Approval	356		6/24/98
To Administrator	8		7/2/98
Surface Impoundment Study	474(15.8)	8/17/98	
EPA-SAB-EEC-98-009			
Meeting	1		5/1/97
Executive Committee Approval	452		7/27/98
To Administrator	21		8/17/98
Blackstone River Initiative	171(5.7)	9/11/98	
EPA-SAB-EPEC-98-011			
Meeting	1		3/25/98
Executive Committee Approval	105		7/8/98
To Administrator	65		9/11/98
1997 STAA Awards	34(1.1)	9/29/98	
EPA-SAB-EC-98-012			
Meeting	1		8/28/98
Executive Committee Approval	14		9/11/98
To Administrator	19		9/29/98
Residual Risk	59(1.9)	9/30/98	
EPA-SAB-EC-98-013			
Meeting	1		8/3/98
Executive Committe Approval	39		9/11/98
To Administrator	19		9/30/98

Letter Reports

Ecological Research Strategy	154(5.1)	12/22/97	
EPA-SAB-EPEC-LTR-98-001			
Meeting	1		7/22/97
Executive Committee Approval	149		12/18/97
To Administrator	4		12/22/97

*Shows date of last public meeting, date report approved by EC, and date report was sent to the Administrator
*Note: Report Number EPA-SAB-98-002 is the present SAB Annual Report and is, therefore, excluded from this table

Letter Reports (cont'd)	Days/Months	Report Date	Other Dates*
Particulate Matter Criteria Document EPA-SAB-CASAC-LTR-98-002	21(0.7)	5/25/98	
Meeting	1		5/5/98
Executive Committee Approval	N/A		N/A
To Administrator	20		5/25/98
Agency-wide Quality Management Program EPA-SAB-EEC-LTR-98-003	87(2.9)	7/24/98	
Meeting	1		4/29/98
Executive Committee Approval	56		6/24/98
To Administrator	30		7/24/98
Advisories			
ERAMS II EPA-SAB-RAC-ADV-98-001	179(5.9)	8/28/98	
Meeting	1		3/3/98
Executive Committee Approval	127		7/8/98
To Administrator	51		8/28/98
Section 812 Prospective Study EPA-SAB-COUNCIL-ADV-98-002	230(7.6)	9/9/98	
Meeting	1		1/23/98
Executive Committee Approval	N/A		N/A
To Administrator	229		9/9/98
Overview of Air Quality Studies EPA-SAB-COUNCIL-ADV-98-003	216(7.2)	9/9/98	
Meeting	1		2/6/98
Executive Committee Approval	N/A		N/A
To Administrator	215		9/9/98
National Drinking Water Contaminant Database EPA-SAB-DWC-ADV-98-004	97(3.2)	9/22/98	
Meeting	1		6/18/98
Executive Committee Approval	85		9/11/98
To Administrator	11		9/22/98

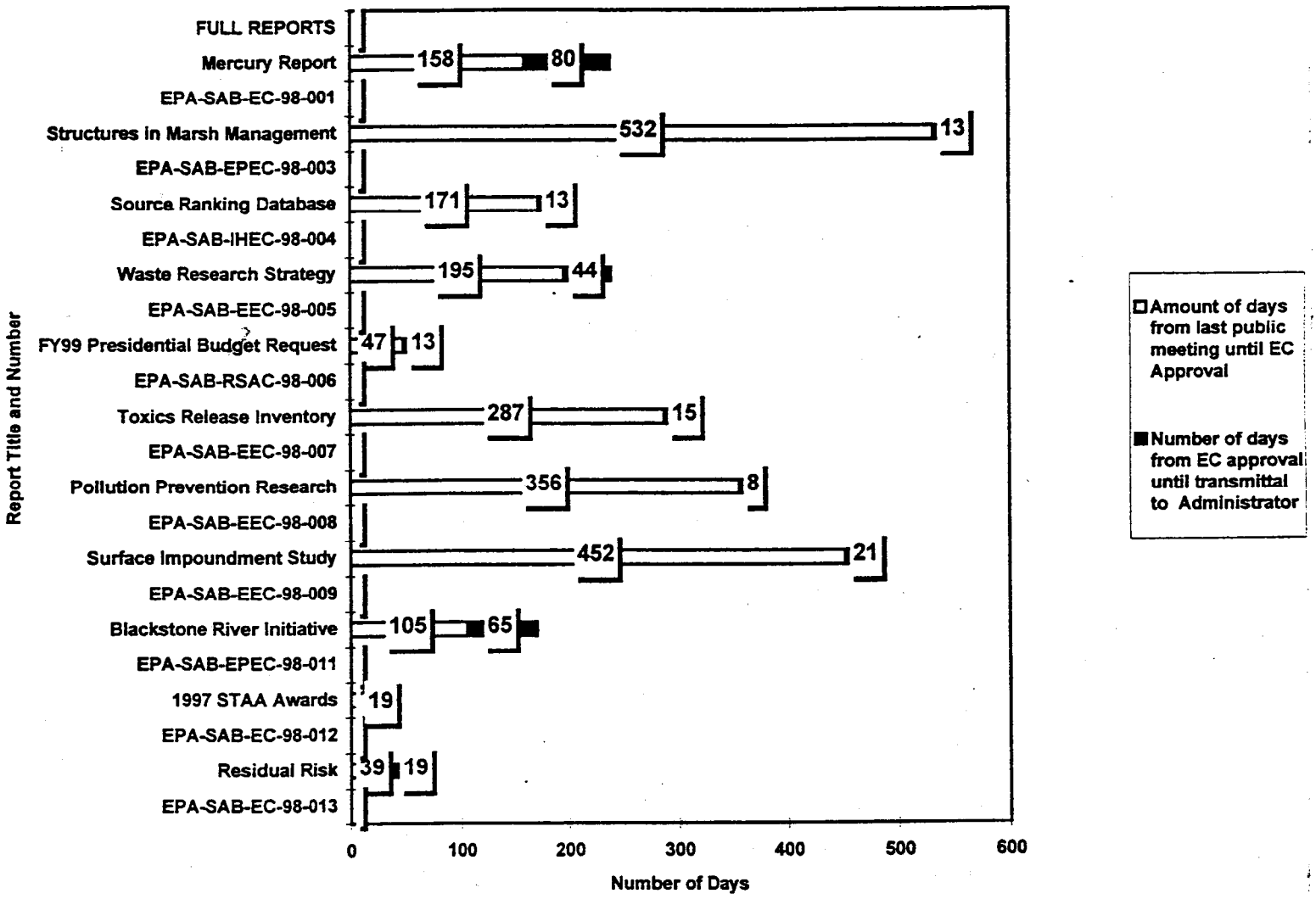
*Shows date of last public meeting,date report approved by EC,and date report was sent to the Administrator
*Note: Report Number EPA-SAB-98-002 is the present SAB Annual Report and is, therefore, excluded from this table

Advisories (cont'd)	Days/Months	Report Date	Other Dates*
Economic Research Topics and Priorities	35(1.2)	9/22/98	
EPA-SAB-EEAC-ADV-98-005			
Meeting	1		8/19/98
Executive Committee Approval	23		9/11/98
To Administrator	11		9/22/98

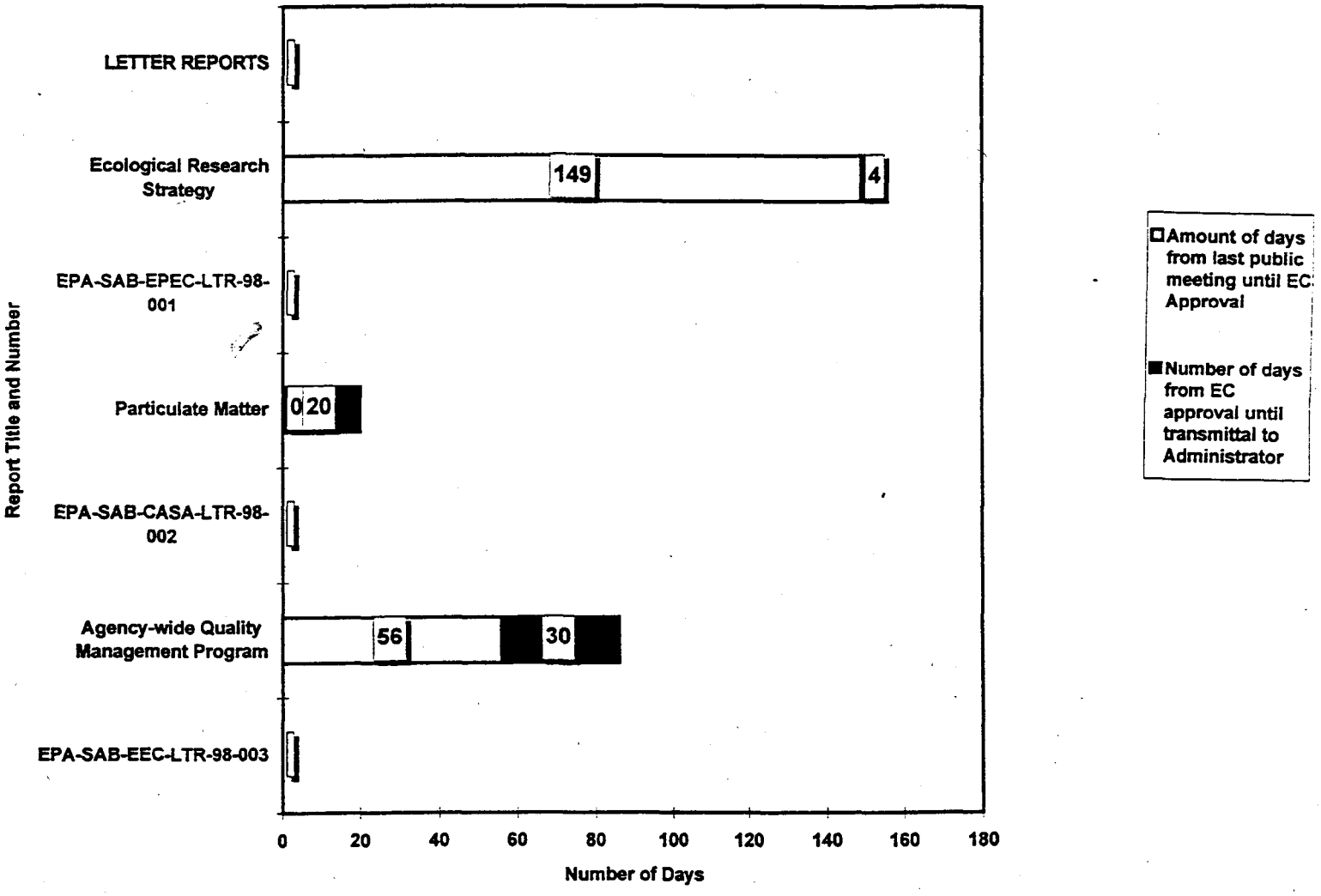
Commentaries	Days/Months	Report Date	Other Dates*
Indoor Air Strategy	267(8.9)	4/14/98	
EPA-SAB-IHEC-COM-98-001			
Meeting	1		7/22/97
Executive Committee Approval	252		3/31/98
To Administrator	14		4/14/98
ORD's Presidential Budget Request	49(1.6)	9/17/98	
EPA-SAB-RSAC-COM-98-002			
Meeting	1		7/31/98
Executive Committee Approval	27		8/27/98
To Administrator	21		9/17/98

*Shows date of last public meeting,date report approved by EC,and date report was sent to the Administrator
*Note: Report Number EPA-SAB-98-002 is the present SAB Annual Report and is, therefore, excluded from this table

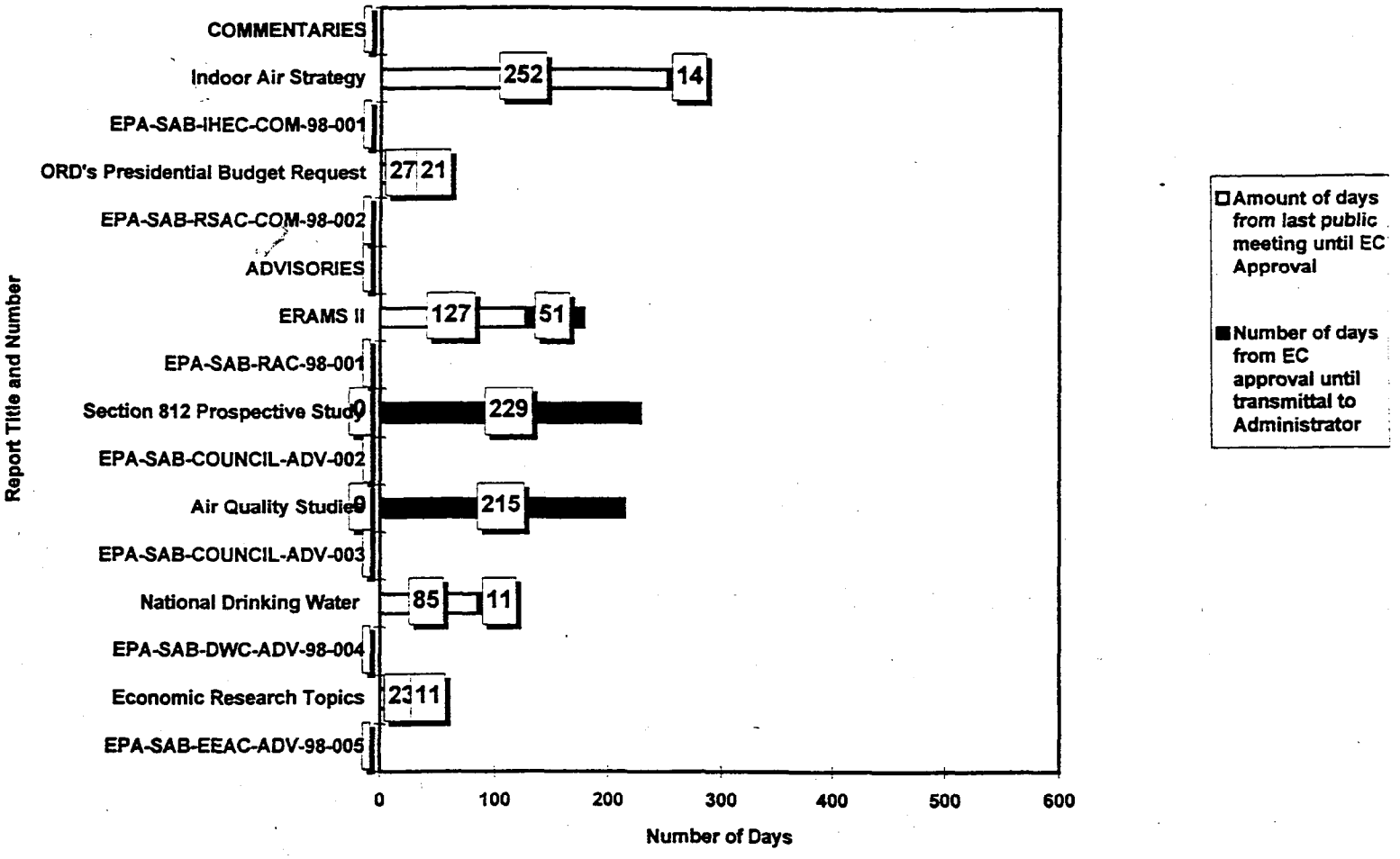
Fiscal Year 1998 Full Reports



Fiscal Year 1998 Letter Reports



Fiscal Year 1998 Commentaries and Advisories



APPENDIX H
BIOGRAPHICAL SKETCHES OF THE SENIOR STAFF MEMBERS

Staff Director	Dr. Donald G. Barnes
Special Assistant	Ms. Anne Barton
Deputy Staff Director	Dr. John R. Fowle, III
Team Leader, Committee Operations Staff Designated Federal Officer	Mr. A. Robert Flaak
Designated Federal Officers	Mrs. Kathleen Conway Mrs. Roslyn Edson Dr. K. Jack Kooyoomjian Mr. Tom Miller Mr. Samuel Rondberg Ms. Stephanie Sanzone

DR. DONALD G. BARNES
Staff Director
Designated Federal Official for the Executive Committee

DR. DONALD G. BARNES assumed his position as Staff Director in 1988. Since arriving, he has overseen a 25% growth in the Committees of the Board and a 50% increase in the membership of the Board. During his tenure the Board has completed three major de novo reports [Future Risk (1988), Reducing Risk (1990), and Beyond the Horizon (1995)] and two self-studies (1989 and 1994), in addition to more than 200 reports to the Administrator.

Dr. Barnes is active in Agency-wide issues associated with science and risk assessment. For example, he serves on the Administrator's Science Policy Council and the Risk Assessment Forum. He continues to publish a variety of risk assessment topics, such as benchmark dose and toxicity equivalency factors.

Dr. Barnes came to the SAB following ten years' service as Senior Science Advisor to the Assistant Administrator for Pesticides and Toxic Substances. In that role he became involved with a number of controversial issues; e.g., pesticide re-registrations, the implementation of Section 5 of TSCA, and "dioxin", for which he received two EPA Gold Medals for Superior Service.

He has been active in the area of risk assessment for more than a decade as practitioner, reviewer and instructor. For example, he participated in the White House's Office of Science and Technology Policy-led effort to produce a consensus view of cancer in the Federal government; i.e., Cancer Principles. He has been was active in the writing of a number of the Agency's risk assessment guidelines; e.g., for cancer and for mixtures. In a tangential activity he has worked with the government of Bulgaria to inculcate risk-based decision making in their emerging environmental protection program, both at the ministry and regional levels.

Prior to coming to EPA, Dr. Barnes was Associate Professor and Science Division Chair at St. Andrews Presbyterian College in North Carolina. His formal education includes a BA (chemistry) from the College of Wooster, a PhD (physical chemistry, with a minor in physics) from the Institute of Molecular Biophysics at Florida State University, and subsequent graduate courses in several health-related areas; i.e., pharmacology, toxicology, immunology and epidemiology.

His real world education continues to be provided by Dr. Karen K. Barnes and their two sons.

DR. JOHN R. "JACK" FOWLE, III
Deputy Staff Director

DR. JACK FOWLE joined the staff as Deputy Director in September 1995. In addition to duties with the SAB staff, Dr. Fowle is interested in the use of science to inform policy and works with the Agency's Science Policy Council, cochairing efforts to implement EPA's Risk Characterization Policy. He is also a member of the Agency's Risk Assessment Forum(RAF), and he chairs the Public Policy Committee for the Society for Risk Analysis.

Dr. Fowle was detailed from EPA to the U.S. Senate as Senator Daniel Patrick Moynihan's Science Advisor from January 1992 until December 1994. While focussing on environmental legislation, he provided advice to the Senator and to the Senate Committee on Environment and Public Works on a wide range of issues. He was the principal staff person working on Senator Moynihan's risk bills in the 102nd and 103rd Congresses.

Before joining Senator Moynihan's staff, Dr. Fowle spent three years in Research Triangle Park, NC as Associate Director of EPA's Health Effects Research Laboratory. He planned and managed EPA's Drinking Water Health Research Program, and coordinated EPA's R&D work efforts with the World Health organization.

Dr. Fowle first came to EPA in 1979 when he joined ORD's Carcinogen Assessment Group, and has served in a variety of other capacities since then. He managed the development of EPA's initial Biotechnology Research Program in 1983 and 1984 and was subsequently detailed to Congressman Gore's Investigation and Oversight Subcommittee, Committee on Science and Technology, as a Science Advisor on Biotechnology issues. He directed the Environmental Health Research staff of the Office of Health Research in ORD at EPA headquarters from 1985 to 1987, and was Health Advisor to EPA's Assistant Administrator for Research & Development in 1988 and 1989, and in 1995.

Dr. Fowle received both his baccalaureate and doctoral degrees in genetics from George Washington University in Washington, DC.

Dr. Fowle, a resident of Washington, DC, is an amateur musician. His wife Kate is a glass jewelry artist. Their daughter, Eliza, is a student in college.

MS. ANNE BARTON
Special Assistant to the Staff Director

MS. ANNE BARTON has been on detail to the SAB since November 1996. She has worked primarily on the futures project and the SAB strategic plan and its follow-up, but has also served as DFO for the Endocrine Disruptors panel and the Secondary Data Use Subcommittee.

Ms. Barton has long taken an interest in the science/policy interface in regulatory agencies, particularly in the area of ecological risk. She is co-chair of an Agency workgroup which is developing guidance for EPA risk managers to help them set ecological objectives.

Ms. Barton has been with EPA since 1975 and spent most of the time since then in the Office of Pesticide Programs. She lives in northwest DC with her husband, two cats, a lot of goldfish and some frogs. She is planning to retire to this setting in the spring of 1999.

MR. A. ROBERT FLAAK
Team Leader, Committee Operations Staff; Designated Federal Officer for the Clean Air Scientific Advisory Committee and the Research Strategies Advisory Committee

MR. A. ROBERT FLAAK served as the Board's Assistant Staff Director from 1991 through 1995. Under the current staff reorganization, he serves as the Team Leader of the Committee Operations Staff of the Board and as Designated Federal Official for two committees. Mr. Flaak was first associated with the Science Advisory Board (SAB) in 1978 when he became the DFO for the Clean Air Scientific Advisory Committee (CASAC) when the committee was first chartered. Since then he has been the DFO for the following SAB committees: CASAC (1978-1979; 1984-1991; 1995-present); Indoor Air Quality/Total Human Exposure Committee (now the Integrated Human Exposure Committee) (1986-1993); Drinking Water Committee (1991-1993; 1995); ad hoc Industrial Landfill Panel (1992-95); Environmental Futures Committee (1993-1995); Research Strategies Advisory Committee (1995-1998), and a host of SAB subcommittees and working groups involved with issues such as global climate, biotechnology and reducing risk.

In addition to his duties with the Board, Mr. Flaak has continued his part-time detail to the Agency's Science Policy Council as a member of the Agency's Peer Review Advisory Group, providing oversight to EPA on the implementation of its peer review policy. As part of that peer review process oversight, the Agency published the new EPA Peer Review Handbook which was coauthored by Mr. Flaak. Since 1988 Mr. Flaak has assisted the General Services Administration (GSA) in the development and presentation of its National training course on Federal Advisory Committee Act (FACA) Management. Along the way he has helped teach over 1500 Federal workers how to run Federal Advisory Committees legally and effectively. Mr. Flaak also has conducted training on FACA and peer review for other Federal agencies including the Office of Government Ethics, Centers for Disease Control, National Institutes for Health, Bureau of Land Management, and the US Forest Service.

Mr. Flaak's academic training is in biological oceanography. He graduated from the City College of New York (BS, Zoology); University of Delaware's Graduate College of Marine Studies (MS, Marine Studies); and Central Michigan University (MA, Public Administration). He has taken other graduate level environment and management courses and has over 20 years of experience as a trainer. He has developed national environmental policy for bridge construction and highway modifications with the Department of Transportation; designed oceanographic surveys and coordination field sampling, laboratory analysis and data analysis and interpretation as Staff Marine Biologist with an engineering consulting firm; conducted original research on phytoplankton dynamics and was a consulting Marine Taxonomist for clients including Du Pont, Roy F. Weston, Inc., and the University of Delaware.

Mr. Flaak was a member of the US Army Reserves from 1966-1995. He retired in 1995 after 29 years including wartime service in South Vietnam in 1968-69, and in Saudi Arabia, Kuwait and Iraq during Operation Desert Storm in 1990-91. He lives in Clifton, Virginia with his wife Dottie, their 13 year old son Chris and their dogs Jennie and Suzy (Suzy is on sabbatical at Grandma's house for the winter).

MS. KATHLEEN CONWAY
Designated Federal Official for the Environmental Engineering Committee

MS. KATHLEEN CONWAY received her BS and MS from Tufts University where she studied biology, public health, and sanitary engineering. Between degrees she wrote for the Hartford Courant. As sanitary engineer for the Massachusetts Department of Public Health, Mrs. Conway worked on water supply, solid waste disposal, and subsurface sewage disposal issues in Central Massachusetts and assisted the Regional Epidemiologist with outbreak investigations. While there, she proposed and organized training on solid waste issues for local boards of health and landfill operators. From 1973-77 she served the U. S. Environmental Protection Agency's Region I as a sanitary engineer in the wastewater treatment plant operations and maintenance program. Most of her work there consisted of inspections, trouble-shooting, and training. During this time she chaired the Boston Section of the Society of Women Engineers.

In 1977 Mrs. Conway left field work in New England to join the Office of Research and Development at EPA Headquarters in Washington, D.C. Her subsequent service as acting Director for two divisions in the Office of Health Research led to her selection, in 1982, as a participant in the President's Executive Exchange Program. During her exchange year she worked with an occupational health and safety unit at IBM. She served the Science Advisory Board as Deputy Director from 1984 to 1989 when she resigned the position to work part-time.

She continued as Designated Federal Official to the Radiation Advisory Committee through FY93 and has since supported the Environmental Engineering Committee. She volunteers with at-risk school children in Arlington where she lives with her three sons and a dog.

MS. ROSLYN EDSON
Designated Federal Official for the Environmental Health Committee and the Integrated Human Exposure Committee

MS. ROSLYN EDSON joined the Science Advisory Board (SAB) in July 1997 as a Designated Federal Official. After completing a DFO orientation process last year, she became the DFO for the Integrated Human Exposure Committee and the Acting DFO for the Environmental Health Committee. Ms. Edson is a Lieutenant-Commander in the United States Public Health Service.

Prior to joining the SAB, Ms. Edson worked as an Industrial Hygienist with the EPA Safety, Health and Environmental Management Division where she developed health and safety guidance material for the EPA Safety and Health Program Management (SHEMP) Managers. She was also heavily involved in conducting ergonomic worksite assessments and ergonomics training to reduce the number and severity of work-related musculoskeletal disorders. Ms. Edson has also worked as an Industrial Hygienist for the National Institutes of Health, the United States Government Printing office, the Potomac Electric Power Company, Service Employees International Union, and the Occupational Safety and Health Administration.

Ms. Edson pursued undergraduate studies (B.S. in Biology, 1988) at the City College of New York and graduate studies (Sc.M. in Environmental Health (Industrial Hygiene), 1990) at the Harvard School of Public Health. Ms. Edson continues to pursue her strong interest in reducing the number and severity of work-related musculoskeletal disorders as a part-time ergonomics trainer for professional organizations and public school systems. She plans ultimately to obtain a doctorate degree related to her ergonomics interest. Ms. Edson resides with her daughter Samantha, who started her "real" academic training as a first grader.

DR. K. JACK KOOYOOMJIAN
Designated Federal Official for the Clean Air Act Compliance Analysis Council and the Radiation Advisory Committee

DR. JACK KOOYOOMJIAN joined the Science Advisory Board (SAB) in July, 1988 as Designated Federal Official (DFO) of the Environmental Engineering Committee (EEC). In 1993, he transitioned to the Radiation Advisory Committee (RAC). In January of 1994, he also served concurrently as DFO of the Advisory Council on Clean Air Compliance Analysis (Council). He brings to his work at the SAB over 28 years of engineering and professional experience with environmental issues, including over 24 years of diverse experience within EPA Headquarters.

In the mid-1970's he worked in the Office of Solid Waste (OSW), documenting cases involving the improper disposal of hazardous wastes, which contributed to the passage of the landmark legislation known as the Resource Conservation and Recovery Act (RCRA) in 1976. He has over four years experience in the Office of Water developing guidelines and regulations for industrial wastewater sources. From 1979 through 1988, Jack was involved with the Superfund's Emergency Response program and developed the multi-media hazardous substance reportable quantity regulations. He was also responsible for oil and hazardous substance pollution prevention regulations, oil spill reporting, as well as the oil and dispersant testing and registration program of the National Contingency Plan.

Dr. Kooyoomjian received a BS (Mechanical Engineering) from the University of Massachusetts, and a MS (Management Science) and a Ph.D. (Environmental Engineering, with a minor in Economics) from Rensselaer Polytechnic Institute. His academic career included his induction into a number of honorary societies: e.g., Sigma Xi (research), Chi-Epsilon (civil engineering), Omicron Delta Epsilon (economics). His professional activities include membership of the Board of Control of the Water Pollution Control Federation (WPCF) [now known as the Water Environment Federation (WEF)] from 1986 to 1989, as well as a being a member of its Policy Advisory Committee in 1988/1989. In 1988 he received the Arthur Sidney Bedell Award from WEF for extraordinary personal service in the water pollution control field. He served as Local Arrangements Co-Chair of WEF's 63rd Conference and Exposition. He is also very active in the Federal Water Quality Association (FWQA), the local member association of WEF, where he has served in numerous capacities, including President, and "Ambassador-at-Large." He is currently Chairman of the Government Affairs Committee of the FWQA. He is listed in "Who's Who in Science and Engineering," and "Who's Who in the Eastern United States."

In April 26, 1992, he received an honorary professorship for his work as part of a five-person team from the United States to develop an environmental engineering bachelors program for the State Engineering University of Armenia (SEUA), which has over 23,000 students, as well as to assist in addressing the newly-independent republic of Armenia's environmental problems. In the summer of 1995, he was an invited lecturer in environmental management to the American University of Armenia (AUA) in Yerevan, Armenia. In this capacity, he taught a University of Southern California sponsored course in Environmental Management focusing on environmental ethics and sustainability concepts to three classes of graduate students, who were majoring in Public Health, Political Science, and Business Administration. In 1997, he was selected as Chairman of the Organizing Committee to form the Greater Metropolitan Washington Area Section (GMWAS) of the Armenian Engineers and Scientists of America (AESA).

Closer to home, which he shares with his wife Gerry, and their three daughters, Jennifer (24), Melissa (19) and Jessica (17), Dr. Kooyoomjian is involved in numerous civic activities which focus on development, land-use and environmental issues in his area. He was a candidate for the Governor's Award for volunteerism for the state of Virginia in 1991. He also has received the EPA Public Service Recognition Award in 1988 and 1992 and several County Recognition Awards, and in 1995 a Virginia State Planning Association award for his civic involvement. In addition to his civic activities, since 1996 he has been serving on the Board of Directors of the Prince William County Service Authority.

MR. TOM MILLER
Designated Federal Official for the Drinking Water Committee and the Environmental Economics Advisory Committee

MR. TOM MILLER joined the Science Advisory Board (SAB) in June, 1996 as Designated Federal Official (DFO) for the Drinking Water Committee (DWC) and the Environmental Economics Advisory Committee (EEAC). Tom was detailed to the SAB during 1994 and served as the DFO for the Clean Air Scientific Advisory Committee CASAC) and the Drinking Water Committee at that time. Tom is also the DFO for the Valuation Subcommittee and the Economic Analysis Subcommittee of the Integrated Risk Project. Tom has worked at the Environmental Protection Agency in regulatory (pesticides, toxic substances), budget, and planning activities (research and development programs) since 1974.

Mr. Miller received a BS (Wildlife Management) in 1972 and an MS (Wildlife Management) in 1975, both from West Virginia University. For his Master's research, Mr. Miller conducted a radio-telemetry study of the black bear in the Monongahela National Forest of West Virginia. In 1993, Tom received a Masters of Public Policy from the University of Maryland School of Public Affairs. Tom's major professional interest is the study of the ways that science and policy development interact to identify and implement appropriate approaches to environmental management, and the role of citizens in decisions leading to the selection of management approaches. He also has an interest in the development of techniques and strategies, to add this body of knowledge to the science curricula in secondary education, the primary venue for science learning for the vast majority of our citizens.

Tom is married and is the father of one daughter (who is a University Senior) and one son (who is a Junior in high school). Tom is involved with leadership positions in his church, and he enjoys flyfishing, backpacking, woodworking, and baseball.

MR. SAMUEL RONDBERG
Designated Federal Official

MR. SAMUEL RONDBERG retired from the Senior Executive Service (SES) in August, 1988 and re-entered federal service in November 1988, when he joined the SAB staff. During his previous full and fruitful career at EPA, he served as an Office Director and Associate Office Director in EPA's Office of Research Development (ORD) and the Office of Information Resources Management (OIRM).

Before joining EPA in 1974, Mr. Rondberg held research management, analytical, and policy formulation positions with the Department of Transportation and the Veterans Administration's Department of Medicine and Surgery. He also served in the US Army for two years, with the rank of Captain. Most of his federal career has been devoted to advancing the use of analytic methodologies to address public policy issues, and to improving the management of federal research activities. At EPA, he has directed particular efforts to the complex problems and issues engendered by operating a research program within the context of a regulatory agency--coordination between legal and scientific "cultures"; maintaining a stable long-term program in the face of urgent and frequently changing needs for short-term support; and maintaining an adequate resource base in the face of competition from regulatory programs struggling to meet court or Congressionally mandated deadlines.

Mr. Rondberg pursued undergraduate (AB, 1959) and graduate studies at Washington University, where he also served as a Teaching Assistant in the Graduate School of Arts and Sciences and as a Public Health Service Fellow and Research Associate in the Medical School. In 1967, he was awarded a National Institute of Public Administration Fellowship in Systematic Analysis at Stanford University and completed a special interdisciplinary curriculum in the Schools of Engineering, Graduate Business, and the Departments of Economics and Computer Science.

Mr. Rondberg has authored publications in clinical psychology, research management, and the applications of electronic systems and telemetry to urban transportation.

Sam's wife (Ruth) of 35 years is a Rehabilitation Counselor; they have one daughter, who completed a Master's degree in Social Work. Sam attempts to find time to pursue interests in modern history, the impacts of technology on society and culture, amateur radio, marine aquaria keeping, and antique posters and advertising graphics as a reflection of our social history.

MS. STEPHANIE SANZONE
Designated Federal Official for the Ecological Processes and Effects Committee

MS. STEPHANIE SANZONE has been a Designated Federal Official at the EPA Science Advisory Board for 5 years, working primarily with the Ecological Processes and Effects Committee. Ms. Sanzone received a B.A. in Biology, with a minor in chemistry, from the University of Virginia, and a M.S. in Marine Science from the University of South Carolina. Prior to coming to SAB, she spent 4 years with EPA's National Estuary Program, a program which assists states and local communities to manage and protect bays and estuaries based on sound science. Ms. Sanzone has also worked to bring science to the legislative process, serving as legislative staff at both the state and federal levels. Her professional interests include management of coastal environments, the role of science and risk assessment in policy making, and making science and scientists intelligible to lay audiences (e.g., policy makers, managers and the public).