

**Summary Minutes of the  
U.S. Environmental Protection Agency (EPA)  
Science Advisory Board (SAB)  
Ecological Processes and Effects Committee Meeting  
January 26, 2007**

Panel Members: See roster of members – Appendix A

Date and Time: Friday, January 26, 2007, 1:00 – 3:00 p.m. (Eastern Standard Time)

Location: By telephone only

Purpose: The purpose of this teleconference was to discuss a draft Committee report, *Advice to EPA on Advancing the Science and Application of Ecological risk Assessment in Environmental Decision Making*.

Attendees: Chair: Judith Meyer

Committee Members: Fred Benfield  
Allen Burton  
Peter Chapman  
Loveday Conquest  
Virginia Dale  
Ivan Fernandez  
Wayne Landis  
Lawrence Master  
James Oris  
Amanda Rodewald  
James Sanders  
Timothy Thompson  
Ivor Van Heerden

SAB Members: Gregory Biddinger

EPA SAB Staff: Thomas Armitage, Designated Federal Officer  
Anthony Maciorowski, Associate Director for Science

Other EPA Staff: Randy Waite, EPA Office of Air and Radiation

Others Present: Nancy Bettinger, Massachusetts Department of Environmental Quality  
Kristi Bubb, Eastern Research Group

Pat Casano, General Electric Company  
James Christman, Hunton and Williams  
Miranda Henning, Environ Corp.  
Bryce Landenberger, Dow Chemical Company  
Adam Sarvana, Risk Policy Report  
Lawrence Tannenbaum, U.S. Army Center for  
Health Protection and Preventive Medicine  
Linda Ziccardi, Exponent Ecosciences

### **Meeting Summary**

The discussion followed the issues and timing as presented in the meeting agenda (Appendix B).

### **Convene Meeting, Call Attendance**

Dr. Thomas Armitage, Designated Federal Officer (DFO) for the SAB Ecological Processes and Effects Committee opened the teleconference at 1:00 p.m. He stated that the call was being held in accordance with the Federal Advisory Committee Act (FACA) procedures. He noted the Committee's compliance with federal ethics and conflict of interest requirements. He stated that records of Committee discussions are maintained, and summary minutes of the meeting would be prepared and certified by the Committee Chair. Dr. Armitage then asked the Committee members and members of the public on the call to identify themselves and their affiliations.

### **Purpose of the Call and Review of the Agenda**

Dr. Virginia Dale began teleconference by stating that her term as Chair of the SAB Ecological Processes and Effects Committee (EPEC) had ended. She introduced the new Committee Chair, Dr. Judith Meyer. Dr. Dale also introduced several new Committee members.

Dr. Meyer thanked Dr. Dale and stated that the purpose of the call was to review a draft EPEC advisory report developed from information gathered at a public ecological risk assessment workshop held by the Committee. Dr. Meyer reviewed the agenda and stated that Dr. Dale would lead the Committee's remaining work to complete the ecological risk assessment advisory report.

### **Discussion of Draft Ecological Risk Assessment Advisory Report**

Dr. Dale called for discussion of the draft advisory report. She described the process for completing SAB Committee reports noting that after EPEC completes the report it will be sent to the Chartered Science Advisory Board for review before it is transmitted to the EPA Administrator. Several members asked questions about how the report should be

organized. Dr. Dale responded that there would be a transmittal letter identifying major points, an executive summary, and the main body of the report. A member stated that it would be important to make sure that points in the executive summary were placed in proper context. He stated that it might helpful to make the executive summary shorter. It was also suggested that important points in the main body of the report might be printed in italics.

Dr. Dale stated that EPEC comments on the draft report would be addressed by a subgroup of the Committee (those who had previously served on the workshop steering committee) and that another draft would be developed and sent to Committee members for review and approval. Member comments on the report were then discussed.

A member suggested that the EPEC report should reference the National Research Council's (NRC) recent review of the U.S. Office of Management and Budget Risk Assessment Bulletin. The member noted that it might be helpful to determine whether recommendations in the EPEC report were consistent with recommendations provided by NRC. A member noted that the subject of uncertainty was addressed in the NRC report, but the NRC report focused on human health risk assessment.

Several members commented on the executive summary. A member stated that the executive summary should mention differences between regional and site specific risk assessment. It was suggested that the executive summary could be shorter. A member stated that the executive summary should call for developing a methodology to interpret weight of evidence. A member stated that it would be helpful to provide examples to illustrate some points in the report. It was suggested that examples discussed at the EPEC workshop could be referenced in the report.

A member stated that the concept of posterior likelihood could be mentioned in the report in the context of how it improves risk communication. The member also indicated that the EPA Environmental Monitoring and Assessment Program (EMAP) or the U.S. Geological Survey Gap analysis could be cited as examples of work that has addressed various aspects of problem formulation and connected science with policy. Another member stated that any examples included should be directly linked to ecological risk assessment.

A member stated that points in the executive summary should be easily understood by persons who may not read the rest of the report. Illustrative examples discussed at the workshop could be included as footnotes. A member stated that examples essential to understanding the report might be included in text boxes.

Dr. Landis noted that the report was "EPA centric." He stated that the report should reference ecological risk assessment work that had been done in Canada, the European Union, and other countries. He also mentioned that it would be important to stress the need to consider climate change effects in risk assessments. Dr. Dale asked Drs. Landis and Chapman to draft a short summary describing important ecological risk assessment

work in other countries and send it with references to the Designated Federal Officer (DFO) for inclusion in the report.

A member noted that the Committee had been talking about a number of issues such as climate change and ongoing international risk assessment work that were not discussed at the EPEC workshop. He questioned whether the Committee wanted to address these issues. Several members noted that climate change was discussed at the workshop and that the Committee would be missing an opportunity if other important points were not included in the report. It was noted that invasive species and land-use changes are also important, but the report should not place undue emphasis on any one stressor. Another member stated that the report should clearly stress the importance of considering management goals when developing risk questions or hypotheses. He stated that this was not clearly communicated in the draft report.

Members also discussed the need for additional research. A member noted that the draft report did not call for additional research support. He noted that additional research was needed to address a number of the complex technical issues raised in the report. Several members stated that the report should explicitly call for additional research support. A member noted that independent “investigator-initiated” research was needed to address points raised in the report. Dr. Dale noted that this could be mentioned in the letter to the EPA Administrator that will accompany the report and is already stated in the report.

Dr. Dale asked for additional comments on the draft report. No comments were offered, so Dr. Dale thanked the members and stated that a subgroup of the Committee (consisting of members who had served on the workshop steering committee) would incorporate member comments (including written comments that were provided prior to the teleconference) into a new draft which would then be circulated to EPEC for approval.

### **Public Comments**

Dr. Meyer then called for public comments. Comments were provided by Dr. Lawrence Tannenbaum, U.S. Army Center for Health Protection and Preventive Medicine. A summary of his comments are included in Appendix C. Dr. Tannenbaum discussed the limitations of using certain tools for risk assessments (such as hazard quotients). He stated that the draft report did not acknowledge the limitations of these risk assessment practices.

Members noted that Dr. Tannenbaum had offered some good points and that it would be useful to address them in the report. Dr. Biddinger offered to review Dr. Tannenbaum’s comments and develop additional text for the report. Dr. Nancy Bettinger, Massachusetts Department of Environmental Quality stated that she had also provided written comments (included in Appendix C). She noted that some of the points raised by Dr. Tannenbaum had been discussed at the workshop.

Dr. Chapman stated that he supported a recommendation in Dr. Bettinger’s written comments calling for differentiation of technical and policy recommendations. Other

members noted that it is sometimes difficult to draw a line between policy and technical issues. A member stated that some of the issues discussed in the report focused on “science policy.” Dr. Dale stated that she thought the draft report did focus on science issues but it was necessary to discuss some of them in a policy context. She noted that it would therefore be difficult to separate the science and policy recommendations. She noted that where possible illustrative examples might be included in the report.

Dr. Meyer thanked those who commented.

### **Discussion of Other Issues and the Process for Completing the Report**

Dr. Meyer indicated that the next draft of the report sent to EPEC for review should contain the draft letter to the EPA Administrator. Dr. Dale discussed the process for completing the report. She stated that the EPEC subgroup would rewrite the report and develop the transmittal letter to the Administrator. Dr. Meyer noted that it might be helpful to refer back to specific examples presented at the workshop. Dr. Rodewald stated that the report could include a paragraph relating recommendations in the EPEC report to those in the NRC review of the Office of Management and Budget Risk Assessment Guidelines. Other members noted that there were many recommendations in the EPEC report that are consistent with the NRC report, but they observed that the NRC report focused on human health risk assessment. Dr. Meyer asked members to review the NRC report and identify how it could be referenced in the EPEC report. She stated that the NRC report was available on the Internet and that she would obtain the address where it could be found (note: the DFO will send this address to the Committee). Dr. Dale also asked members to send illustrative examples to be included in the report to the DFO along with references and an indication of where they should be placed. Dr. Dale stated that another draft of the report would be developed by February 16, and that the new draft would be discussed by the subgroup on a teleconference on February 21. She stated that the revised report would then be sent to EPEC members for review and approval.

Adam Sarvana, a reporter representing Risk Policy Report asked several questions about text in the report. His questions focused on the definition of “programmatic level” risk assessments and how climate change might be addressed in the report. Several members offered responses. Dr. Dale noted that the Committee’s report was still under development and would undergo further review by EPEC and the Chartered Science Advisory Board.

The Chair then thanked members for participating and adjourned the teleconference.

Respectfully Submitted:

Certified as True:

*/Signed/*

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Dr. Thomas Armitage  
Designated Federal Officer

*/Signed/*

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Dr. Judith Meyer, Chair  
Ecological Processes and Effects  
Committee

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Dr. Virginia Dale, Former Chair  
Ecological Processes and Effects  
Committee

## **APPENDICES**

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Appendix A: Roster of SAB Ecological Processes and Effects Committee

Appendix B: Meeting Agenda

Appendix C: Public Comments

**Appendix A – Committee Roster (includes current and former EPEC members and other SAB members who are developing this report)**

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**U.S. Environmental Protection Agency  
Science Advisory Board  
Ecological Processes and Effects Committee**

**CHAIR**

**Dr. Virginia Dale\***, Corporate Fellow, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN

**Dr. Judith L. Meyer**, Distinguished Research Professor Emeritus, Institute of Ecology, University of Georgia, Athens, GA

**MEMBERS**

**Dr. Richelle Allen-King**, Associate Professor of Geology, University at Buffalo, Buffalo, NY

**Dr. Fred Benfield**, Professor of Ecology, Department of Biological Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA,

**Dr. G. Allen Burton**, Professor and Director, Institute for Environmental Quality, Wright State University, Dayton, OH

**Dr. Peter Chapman**, Principal and Senior Environmental Scientist, Environmental Sciences Group, Golder Associates Ltd, North Vancouver, BC, Canada

**Dr. Loveday Conquest**, Professor and Associate Director, School of Aquatic and Fishery Sciences, University of Washington, Seattle, WA

**Dr. Ivan J. Fernandez\*\***, Professor, Department of Plant, Soil and Environmental Sciences, University of Maine, Orono, ME

**Dr. Wayne Landis**, Professor and Director, Institute of Environmental Toxicology, Western Washington University, Bellingham, WA, USA

**Dr. Lawrence L. Master\*\***, Chief Zoologist, NatureServe, Boston, MA

**Dr. William Mitsch**, Professor, Olentangy River Wetland Research Park, The Ohio State University, Columbus, OH

**Dr. Thomas C. Mueller\*\***, Professor, Department of Plant Sciences, University of Tennessee, Knoxville, TN

**Dr. Michael C. Newman\*\***, Professor of Marine Science, School of Marine Sciences, Virginia Institute of Marine Science, College of William & Mary, Gloucester Point, VA

**Dr. James Oris**, Professor, Department of Zoology, Miami University, Oxford, OH

**Dr. Charles Rabeni**, Leader, Missouri Cooperative Fish and Wildlife Research Unit, U.S. Geological Survey, Columbia, MO

**Dr. Amanda Rodewald**, Associate Professor of Wildlife Ecology, School of Environment and Natural Resources, The Ohio State University, Columbus, OH

**Dr. James Sanders**, Director, Skidaway Institute of Oceanography, Savannah, GA

**Mr. Timothy Thompson**, Senior Environmental Scientist, Science, Engineering, and the Environment, LLC, Seattle, WA

**Dr. Ivor van Heerden**, Associate Professor & Director, Department of Civil and Environment Engineering, LSU Hurricane Public Health Research Center, Louisiana State University, Baton Rouge, LA, USA

#### **OTHER SCIENCE ADVISORY BOARD MEMBERS**

**Dr. Gregory Biddinger**, Environmental Programs Coordinator, ExxonMobil Biomedical Sciences, Inc., Houston, TX

#### **SCIENCE ADVISORY BOARD STAFF**

**Dr. Thomas Armitage**, Designated Federal Officer, Washington, DC,

\* Former Chair, Ecological Processes and Effects Committee

\*\* Former Member, Ecological Processes and Effects Committee

## Appendix B – Teleconference Agenda

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**SCIENCE ADVISORY BOARD**  
**Ecological Processes and Effects Committee**  
**Public Teleconference**  
**January 26, 2007, 1:00 p.m. – 3:00 p.m. (Eastern Standard Time)**

### Agenda

1:00 p.m.	Convene Meeting	Dr. Thomas Armitage Designated Federal Officer EPA Science Advisory Board
1:10 p.m.	Introduction of New EPEC Chair and Members	Dr. Virginia Dale
1:20 p.m.	Purpose of the Call and Review of of the Agenda	Dr. Judith Meyer, Chair
1:25 p.m.	Discussion of Draft Ecological Risk Assessment Advisory Report	Dr. Virginia Dale and Committee
2:30 p.m.	Public Comments	
2:45 p.m.	Next Steps and Assignments	Drs. Virginia Dale and Judith Meyer
3:00 p.m.	Adjourn	

## Public Comments Provided for EPEC Teleconference on 1/26/07

**Dr. Nancy Bettinger, Massachusetts Department of Environmental Protection**

Dr. Thomas Armitage, Designated Federal Officer  
EPA SAB Staff Office (1400F)  
U.S. EPA  
1200 Pennsylvania Avenue, NW  
Washington, D.C. 20460

January 18, 2007

Dear Dr. Armitage:

Thank you for the opportunity to comment on the *Draft Advisory Report – Advice to EPA on Advancing the Science and Application of Ecological Risk Assessment in Environmental Decision Making* prepared by the Science Advisory Board’s Environmental Processes and Effects Committee. The Report provides a clear, concise discussion of a range of important questions and controversial issues facing risk assessment practitioners in a number of agencies and programs. Beyond any short-term impact on EPA risk assessment practices, I believe that the SAB report and the discussions leading up to it will prove to be a pivotal stage in longer-term efforts to advance ecological risk assessment practices.

I would like to offer a comment on the recommendation in the Report’s “Contaminated Site Management” section that CERCLA risk assessments investigate large-scale spatial, temporal, or population-level effects (versus organism-level effects). A similar recommendation in the Report’s more general “Findings and Recommendations” section emphasizes a need for techniques for assessing risks at all levels of biological organization (community, habitat and landscape scales) and a need for the use of population models in ecological effects assessment. The Report acknowledges that CERCLA requires that the risk assessment focus on the site in question, and that under CERCLA, a contaminated site remedy must be protective of the environment within its boundaries. Nevertheless, the Report encourages EPA to further evaluate how large scale or population effects could be investigated in the context of legal and regulatory requirements that may limit the focus of assessments. This appears to be a policy recommendation that goes beyond technical and scientific advice.

It is not entirely clear whether the Committee intends to recommend that risk assessments focus on effects at higher levels of biological organization in addition to organism-level effects or instead of them. In either case, the relevance of organism-level risk estimates to risk management decisions within a given regulatory program seems to be primarily a matter of policy. For this reason, I suggest that the Committee consider omitting from the Report (or at least from the “Contaminated Site Management” section of the report)

the recommendations that EPA risk assessments should evaluate risk at the population, community, and landscape levels of biological organization. If the Committee believes it is important to make this policy recommendation, then they should explicitly differentiate it from other recommendations that are more technical in nature.

At the same time, the validity of using organism-level measurements to estimate population or community-level risks seems to be primarily a technical/scientific question, as opposed to a policy issue. Accordingly, I would suggest that the Committee consider expanding the Report slightly to emphasize the uncertainties inherent in: (1) extrapolating from organism-level measurements to population-level risk estimates and (2) using organism-level risk estimates as surrogates for population risk estimates.

Overall, I think that the Committee has succeeded in the difficult task of integrating the divergent opinions and disparate recommendations offered during the February 2006 public workshop into a coherent summary report. Thank you for your hard work and valuable contributions.

Sincerely,

Nancy Bettinger  
MassDEP, Office of Research and Standards  
One Winter Street  
Boston, MA 02108

**Lawrence Tannenbaum, U.S. Army Center for Health Protection and Preventive Medicine**

(Mr. Tannenbaum has indicated that his comments represent his own views and not those of his employer.)

- From ERA's beginnings through to the present day, there has never been a means for assessing ecological "risk".

- It doesn't matter that we have no means of assessing ecological "risk"; ecological "risk" is the entirely wrong entity to be pursuing, and this is evident from the features of the sites we have to work with.

- What is needed in place of "ecological risk assessment" is "ecological effects assessment" or "ecological impact assessment".

- There exists a vastly advanced approach to study (far surpassing the abilities of the current ERA methodology), with the capability of rendering what are for all intents and purposes, definitive determinations of ecological receptor health.

\* Two useful references regarding the above are:

Tannenbaum, L.V., 2003. Can Ecological Receptors Really Be At Risk? *Human and Ecological Risk Assessment*, Volume 9(1): 5-13.

Tannenbaum, L.V., 2005. A Critical Assessment of the Ecological Risk Assessment Process: A Review of Misapplied Concepts. *Integrated Environmental Assessment and Management*, Volume 1(1): 66-72.