

**U.S. Environmental Protection Agency
Science Advisory Board
Ecological Processes and Effects Committee Augmented for Ballast Water Advisory**

Public Teleconference Call
November 4, 2010
11:00 a.m. to 2:00 p.m. Eastern Time

Minutes of the Meeting

Attendees:

Ecological Processes and Effects Committee (EPEC) Augmented for Ballast Water Advisory: James Sanders (delegated Chair for this meeting only), Judy Meyer (Chair), Fred Benfield, Ingrid Burke, JoAnn Burkholder, Allen Burton, Peter Chapman, William Clements, Andrew Cohen, Loveday Conquest, Robert Diaz, Fred Dobbs, Lisa Drake, Charles Haas, Thomas W. La Point, Wayne Landis, Edward Lemieux, David Lodge, Kevin Reynolds, Amanda Rodewald, , Mario Tamburri, Nicholas Welschmeyer (for full roster, see Attachment A).

SAB Staff Office: Iris Goodman (Designated Federal Officer)

EPA Staff: Ryan Albert, EPA, Office of Water

Other Attendees: Names of those who requested the teleconference call-in number are provided in Attachment B.

Purpose: to discuss the draft working papers prepared by subgroups of the EPEC Ballast Water Advisory Panel as exploratory responses to the charge questions to the Panel.

Meeting Materials:

All materials discussed at the meeting are available at the SAB Web site, <http://www.epa.gov/sab>, at the [November 4, 2010 Ballast Water Advisory Panel Meeting](#) page.

Summary of Discussions:

This meeting was announced in the Federal Register¹ and proceeded according to the meeting agenda.² **Ms. Goodman**, Designated Federal Officer for the Panel, convened the meeting and noted that the Ballast Water Advisory Panel (herein, Panel) operates in accordance with the Federal Advisory Committee Act. This means that meetings are announced and open to the public, all materials prepared for or by the Panel are available to the public, and meeting minutes are prepared. She noted that discussions on the call would reference two draft working papers prepared by subgroups of the Panel that had been made available on the SAB website: (1) draft response to charge question 4: limitations of existing data, and (2) draft text: Onshore Treatment for Subgroup 3, draft outline section VI. She said that one written public comment had been received and posted; this same person had registered in advance to provide oral comments at the meeting.

A. Public Comments

Dr. Raymond Vaughn, Environmental Scientist the New York State Attorney General's Office and member of New York's ballast water management team, commented³ on the need to correctly and consistently frame statistical issues related to sampling and testing the effectiveness of ballast water treatment technologies. Dr. Vaughn encouraged the Committee to separately assess related to quality control, the effects of procedures to concentrate sample volumes, and the effects of aggregation or clustering of organisms. He also urged the Committee to focus on statistical issues related to ballast water treatment system performance, not momentary malfunctions, and recommended using the required Poisson volume for testing.

Dr. Sanders, in his role as delegated Chair of the Panel, welcomed the group and thanked Dr. Vaughn for his comments. Dr. Sanders noted that EPEC's discussions from the October 26, 2010, teleconference focused on drafts prepared by Subgroups 1 and 2 in response to the first three charge questions, and on the annotated draft outline prepared by Subgroup 3 in response to charge question 4. He stated that today's meeting had three primary goals: (1) to discuss the revised draft text developed in response to question 4, which asks the Panel's advice about the principal limitations of available information on the status of BWMS technologies, and how these limitations could be overcome or corrected in future assessments of shipboard technologies for treating ballast water; (2) to discuss the creation of additional subgroups of the Committee to address issues that cut across the charge questions, as proposed during the October 26, 2010, teleconference. Dr. Sanders reminded everyone that the Panel was working in fact-finding mode, thus, the materials discussed remain draft works in progress. As such, they do not constitute consensus advice or recommendations, nor do they represent SAB views or EPA policy. He asked that these drafts not be cited or quoted.

Dr. Sanders asked **Dr. Lodge** to give an overview of the draft response⁴ to charge question 4. Dr. Lodge noted that the draft text characterizes current ballast water treatment and testing protocols as a continuum of practices that could be improved (Section II), and testing issues that have inherent limitations (Section III). Section IV describes how testing protocols relate to the feasibility of methods for determining voluntary compliance and for enforcing standards.

He said that Sections V- VII of the draft text address ballast water treatment issues from the perspective of the broader context within which treatment systems operate. These sections identify approaches for the managing risks of invasive species beyond strictly shipboard treatment. These options include managing ballast water uptake, reducing risk from ballast water discharges, onshore treatment, and voyage-based risk management. Dr. Lodge then identified several issues for which Subgroup 3 sought feedback from the full Committee:

1) Was it useful to describe current ballast water treatment and testing protocols as a continuum, from those that could be improved to those having inherent (perhaps insurmountable) limitations? He noted that direct measurement of viable organisms is an example of the latter, and said that indirect or surrogate measures needed more attention, since they would be more practical.

2) How might approaches such as Hazard Analysis and Critical Control Points (HACCP) be considered for managing ballast water, e.g., as an alternative way to evaluate risk, or as a framework for seeing that all operational parameters are managed in order reduce risk? Does the HACCP concept enable a fuller discussion of these issues?

3) To what extent should the text on onshore treatment be further developed, e.g., to more fully describe the limitations of onshore treatment, in addition to its advantages?

B. Discussion of charge question 4 as presented in draft text by Subgroup 3

The Panel then turned to discussion of the draft text,⁵ taking each point raised by Dr. Lodge in turn. During the discussion the Panel members raised the following issues.

Characterizing test protocols as a continuum

- Several panel members supported the continuum concept, but noted the concept should also address standards that cannot be achieved with current BWMS technologies. Some panelists thought that indirect (or surrogate) measures addressed this issue, i.e., use of indirect measures could more reliably verify treatment performance, even for standards beyond D-2. Others considered potential ramifications with respect to protocols for testing technology certification and for compliance.
- Others emphasized that the ETV (Environmental Technology Verification) panel had thoroughly investigated issues related to surrogates. Thus, this Panel should not repeat such analyses, and should use ETV's definition of surrogate measures to avoid confusion.

Role of HACCP

- Many panelists supported the concepts underlying HACCP methods, especially its use as a process-based approach to implementing risk management. They encouraged further elaboration in the text, e.g., on how HACCP is applied quantitatively in other fields.

Onshore treatment

- One panelist emphasized the importance of addressing two technical issues related to onshore treatment as determined based on evidence; namely, whether it is effective and whether it is feasible for treating ballast water.
- Several panelists agreed that onshore treatment is important, but noted that it is one option among others, e.g., ballast-less ships or "other approaches" as discussed in Section V of the draft text. They expressed concern that addressing all such options would diminish the Panel's focus on the charge questions. Similarly, investigating only onshore treatment would place undue focus on it alone.
- Several panelists thought that onshore treatment should be included, both on its own merits, and as a way to "bracket" treatment capabilities for future technology development.
- Many panelists agreed the text about onshore treatment should be brief in length and balanced in tone. They expressed concern the existing draft text advocated for onshore treatment. A few panelists suggested the discussion of onshore treatment be placed in an appendix.

C. Discussion of cross-cutting topics to be explored by new Subgroups

HACCP and/or risk assessment as framework for management (lead discussants: Drs. Haas, Landis and Lodge)

- Leads discussants agreed that HACCP could be used for risk management, based on identification of critical control points, understanding of what individual treatment processes can achieve, identification of sentinel parameters to be used to measure those processes as a way to infer treatment, and corrective actions that would need to be taken when a sentinel parameter is exceeded. They also agree that HACCP could be used as a framework for couching a response to the overall charge; i.e., using a systems approach to manage risk of invasive species. They noted such a framework could conceivably be integrated with a probabilistic framework for understanding propagule pressure as it relates to risk of invasion (such as from the NRC study). Panelists noted they couldn't achieve such integration given the Panel's time constraints, but that the concept could be presented in the report.

Onshore treatment (Lead discussants: Drs. Haas, Dobbs and Cohen)

- A few panelists agreed the charge to the Panel warrants inclusion of onshore treatment.
- Panelists agreed ship-board treatment systems must meet demanding constraints found on ships (e.g., size, power) and that onshore treatment could be used to describe treatment levels that can be achieved when these constraints are removed.
- Panelists disagreed on whether the existing draft is adequate or where it should be placed within the report.

Additional test parameters for ballast water treatment technologies (Lead discussant: Dr. Tamburri)

- Panelists discussed parameters that could be used to qualitatively illustrate how treatment performance is affected when BWMS technologies are applied to different kinds of ships. These parameters include: ambient salinity and temperature, ballasting rate and volume, hold-time, hazard zones (e.g., explosion risks), risk of corrosion, and whether the ship was manned or unmanned. They noted that considering all such parameters is unwieldy and parameters would need to be prioritized in order to categorize operational constraints in a general way.
- Panelists discussed that these parameters could be considered for use in developing more robust measures for use on ships and that they could also be considered for use both in testing approval and compliance monitoring.

Sampling issues and statistical interpretations (Lead discussants: Drs. Conquest, Burkholder, Diaz and Drake)

- Panelists expressed their appreciation for the public comments provided by Dr. Vaughn.
- Panelists discussed how sampling and statistical interpretations should be framed and presented in the report. Panelists agreed that the text should be brief, oriented to issues of interpretation of result, and placed in the beginning of the report, following the introduction that describes the regulatory context.

Compliance monitoring and testing (Lead discussants: Dr. Lodge and Mr. Reynolds)

- Panelists agreed that this issue had been covered during the previous discussions of additional test parameters and issues related to sampling and statistical interpretations.

Summary, next steps, and assignments:

Dr. Sanders thanked the Panel for their contributions and discussion. He described that the Panel would create additional Subgroups for the purpose of exploring cross-cutting issues and to develop draft text for the full Panel to consider and discuss during the next public meeting. This next meeting would be a two-day, face-to-face meeting to be scheduled for late January 2011.

He identified the cross-cutting issues and subgroup members as shown below.

- Onshore treatment: Haas, Dobbs, Cohen, Tamburri, Lodge, Dobbs.
- Compliance monitoring and testing: Lodge, Reynolds, Tamburri, Burkholder, Dobbs
- Testing parameters and applicability: Tamburri, Drake, Welschmeyer, Conquest, Sanders, Reynolds, Dobbs, Lodge
- Statistics and interpretations: Conquest, Burkholder, Diaz, Drake, Tamburri, Dobbs, Lodge
- HACCP and risk management: Haas, Landis, Lodge, Cohen, Tamburri, Dobbs.

Dr. Sanders thanked members for their comments and reviewed the next steps to develop the Committee's advisory report. He said that Ms. Goodman would contact the subgroups to schedule their respective teleconference. He instructed the subgroups to independently develop their draft texts via email among their respective Subgroup members, and to always copy Dr. Meyer and Ms. Goodman on their draft texts. The teleconference was adjourned at 2:00 p.m. Eastern time.

Respectfully Submitted:

Certified as Accurate:

/Signed/

/Signed/

Iris Goodman,
Designated Federal Officer

Dr. Judith L Meyer, Chair
SAB Ecological Processes and
Effects Committee

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by Panel members during the course of deliberations within the meeting. Such ideas, suggestions and deliberations do not necessarily reflect consensus advice from Panel members. The reader is cautioned to not rely on the minutes to represent final, approved, consensus advice and recommendations offered to the Agency. Such advice and recommendations may be found in the final advisories, commentaries, letters or reports prepared and transmitted to the EPA Administrator following the public meetings.

ATTACHMENT A: COMMITTEE ROSTER

U.S. Environmental Protection Agency Science Advisory Board Ecological Processes and Effects Committee Augmented for the Ballast Water Advisory

CHAIR

Dr. Judith L. Meyer, Distinguished Research Professor Emeritus, Odum School of Ecology, University of Georgia, Lopez Island, WA

MEMBERS

Dr. E. Fred Benfield, Professor of Ecology, Department of Biological Sciences, Virginia Tech, Blacksburg, VA

Dr. Ingrid Burke, Director, Haub School and Ruckelshaus Institute of Environment and Natural Resources, University of Wyoming, Laramie, WY

Dr. G. Allen Burton, Professor and Director, Cooperative Institute for Limnology and Ecosystems Research, School of Natural Resources and Environment, University of Michigan, Ann Arbor, MI

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

Dr. William Clements, Professor, Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, CO

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

Dr. Robert Diaz, Professor, Department of Biological Sciences, Virginia Institute of Marine Science, College of William and Mary, Gloucester Pt., VA

Dr. Wayne Landis, Professor and Director, Department of Environmental Toxicology, Institute of Environmental Toxicology, Huxley College of the Environment, Western Washington University, Bellingham, WA

Dr. Thomas W. La Point, Professor, Department of Biological Sciences, University of North Texas, Denton, TX

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

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

CONSULTANTS

Dr. JoAnn Burkholder, Professor, Department of Plant Biology, Center for Applied Aquatic Ecology, North Carolina State University, Raleigh, NC

Dr. Andrew Cohen, Senior Scientist and Director, Biological Invasions Program, San Francisco Estuary Institute, Oakland, CA

Dr. Fred Dobbs, Professor and Graduate Program Director, Ocean, Earth and Atmospheric Sciences, College of Sciences, Old Dominion University, Norfolk, VA

Dr. Lisa Drake, Senior Scientist, Science Applications International Corporation, Key West, FL

Dr. Charles Haas, L.D. Betz Professor of Environmental Engineering, Civil, Architectural and Environmental Engineering, College of Engineering, Drexel University, Philadelphia, PA

Mr. Edward Lemieux, Director, Center for Corrosion Science Engineering, Naval Research Laboratory, Washington, DC

Dr. David Lodge, Professor, Biological Sciences, University of Notre Dame, Notre Dame, IN

Mr. Kevin Reynolds, Senior Marine Engineer, The Glostn Associates, Seattle, WA

Dr. Mario Tamburri, Associate Professor, Chesapeake Biological Laboratory, Maritime Environmental Resource Center, University of Maryland Center for Environmental Science, Solomons, MD, United States

Dr. Nicholas Welschmeyer, Professor of Oceanography, Moss Landing Marine Laboratories, San Jose State University, Moss Landing, CA

SCIENCE ADVISORY BOARD STAFF

Dr. Thomas Armitage, Designated Federal Officer, U.S. Environmental Protection Agency, Washington, DC

Ms. Iris Goodman, Designated Federal Officer, U.S. Environmental Protection Agency, Washington, DC

Attachment B:

Members of the public who requested the call-in number for the Nov. 4 teleconference.

Ryan Albert, EPA Office of Water

Allegra Cangelosi, Senior Policy Analyst, Northeast-Midwest Institute

Richard Everett, U.S. Coast Guard

Rian V. Hooff, Ballast Water Program Manager, Oregon Dept. of Environmental Quality

Nick Juliano, Associate Editor, Inside EPA

Raymond Vaughan, New York State, Office of the Attorney General

Linda M. Wilson, New York State, Office of the Attorney General

Materials Cited

The following meeting materials are available on the SAB website, <http://www.epa.gov/sab>, at the November 4, 2010 Ecological Processes and Effects Committee meeting page:

<http://yosemite.epa.gov/sab/sabproduct.nsf/a84bfee16cc358ad85256ccd006b0b4b/412eaa9f2963e095852577ad00520d31!OpenDocument&Date=2010-11-04>

¹ Notification of Two Public Teleconferences of the Science Advisory Board's Ecological Processes and Effects Committee Augmented for Ballast Water. 75.195.62386-62387. Published 10/8/2010.

² Meeting Agenda, November 4, 2010

³ Comments from Dr. Vaughn, New York State Attorney General's Office.

⁴ Draft response to charge question 4: limitations of existing studies and reports.

⁵ Draft text: Onshore Treatment for Subgroup 3, draft outline section VI.