

**United States Environmental Protection Agency (U.S. EPA)  
Chartered Science Advisory Board (SAB)  
Meeting Minutes**

**Date and Time:** Wednesday, November 30, 2016 1:30 p.m. – 5:00 p.m.  
Thursday December 1, 2016 9:00 a.m. -12:00 p.m.

**Location:** Westin Arlington Gateway  
801 North Glebe Road, Arlington, VA 22202

**Purpose:** To conduct a quality review of the draft SAB review of the EPA’s proposed Methodology for Mortality Risk Valuation Estimates for Policy Analysis; discuss information provided by the EPA on planned actions in the Spring 2016 semi-annual regulatory agenda and their supporting science; discuss information about shipboard treatment efficacy in the SAB report, Efficacy of Ballast Water Treatment Systems: A Report by the Science Advisory Board; and receive briefings on future topics from the EPA.

**Meeting Participants:**

**SAB Members** (for full Board, see Roster)

Dr. Peter Thorne, Chair	Dr. Robert Johnston	Dr. David Richardson
Dr. Joseph Arvai	Dr. Kimberly L. Jones	Dr. Tara Sabo-Atwood
Dr. Kiros Berhane	Dr. Madhu Khanna	Dr. William Schlesinger
Dr. Sylvie M. Brouder	Dr. Francine Laden	Dr. Daniel O. Stram
Dr. Ingrid Burke	Dr. Robert Mace	Dr. Jay Turner
Dr. Anna Diez Roux	Dr. Sue Marty	Dr. Jeanne VanBriesen
Dr. Michael Dourson	Dr. Denise Mauzerall	Dr. John Vena
Dr. Joel Ducoste	Dr. Kristina Mena	Dr. Elke Weber
Dr. David A. Dzombak	Dr. Surabi Menon	Dr. Charles Werth
Dr. Elaine Faustman	Dr. James R. Mihelcic	Dr. Peter J. Wilcoxon
Dr. Susan Felter	Dr. James Opaluch	Dr. Robyn Wilson
Dr. H. Christopher Frey	Dr. Thoams Parkerton	
Dr. Steven Hamburg	Dr. Kenneth Portier	
Dr. Cynthia Harris	Dr. Kenneth Ramos	

**SAB Staff:**

Mr. Thomas Carpenter, Designated Federal Officer (DFO) for the Chartered SAB and SAB Work Group on EPA Planned Actions for SAB Consideration of the Underlying Science  
Mr. Christopher S. Zarba, SAB Staff Office Director  
Dr. Thomas Armitage, DFO, SAB Biogenic Carbon Emissions Panel

**Other Attendees:** Names of those who attended the meeting are listed in Attachment A. Names of those who requested the teleconference call-in number are provided in Attachment B.

### **Meeting Summary:**

#### **Convene the meeting**

Mr. Thomas Carpenter, Designated Federal Officer (DFO) for the chartered SAB, formally opened the meeting and noted that this federal advisory committee meeting was announced in the Federal Register<sup>1</sup>. The SAB is an independent, expert scientific federal advisory committee chartered under the authority of the Federal Advisory Committee Act (FACA). The SAB is empowered by law, the Environmental Research, Development, and Demonstration Authorization Act (ERDDAA), to provide advice to the EPA Administrator on scientific and technical issues that support the EPA's decisions. The DFO noted that the Federal Register notice announcing the meeting provided the public with an opportunity to provide written and oral comment.

The DFO stated that the SAB consists entirely of special government employees (SGEs) appointed by the EPA Administrator to their positions. As SGEs, chartered SAB members are subject to all applicable ethics laws and implementing regulations. EPA has determined that advisors participating in this meeting have no financial conflicts of interest nor the appearance of a loss of impartiality under ethics regulations specified in 5 CFR §2635 relating to the topics of this meeting.

#### **Purpose of the teleconference and review of the agenda**

The SAB Chair, Dr. Peter Thorne, stated that the purpose of the meeting was to conduct a quality review of the draft SAB review of the EPA's proposed Methodology for Mortality Risk Valuation Estimates for Policy Analysis; discuss information provided by the EPA on planned actions in the Spring 2016 semi-annual regulatory agenda and their supporting science; discuss information about shipboard treatment efficacy in the SAB report, Efficacy of Ballast Water Treatment Systems: A Report by the Science Advisory Board and receive briefings on future topics from the EPA.

#### **Quality review of the Draft (10-27-16) SAB Review of EPA's Proposed Methodology for Updating Mortality Risk Valuation Estimates for Policy Analysis**

Dr. Thorne reminded members that the purpose of the quality review is to determine if the report is ready to transmit to the Administrator as an SAB report and under what conditions. In reaching that determination he asked them to focus on the SAB's four quality review questions:

- Were the charge questions adequately addressed?
- Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the draft report?
- Is the draft report clear and logical?

- Are the conclusions drawn or recommendations provided supported by the body of the draft report?

#### Presentation from the Panel Chair

Dr. Thorne noted that there were no registered speakers and the agenda would proceed to a summary of the report by Dr. Madhu Khanna, Chair of the SAB Environmental Economics Advisory Committee (EEAC) and asked her to provide an overview of the draft report as an introduction to the quality review discussion.

Dr. Khanna summarized the report and noted the Agency asked for feedback on proposed improvements to the agency's methodology for estimating benefits associated with reduced risk of mortality. This methodology, which is used in regulatory benefit-cost analyses, takes into account the amounts that individuals are willing to pay for small reductions in mortality risk. The resulting values are combined into an estimate commonly known as the "Value of Statistical Life (VSL)." EPA is also asking the SAB to review options for accounting for changes in the VSL over time as real income grows, known as "income elasticity" of willingness to pay. After taking this input into account EPA expects to incorporate revised guidance on these matters into the Agency's Guidelines for Preparing Economic Analysis.

She noted the EEAC has one face to face meeting and two teleconferences to discuss the 17 charge questions on the three white papers. She acknowledged the hard work done by the EEAC and that Drs. Kevin Boyle, Kerry Smith, George Van Houtven of the committee have joined via conference line into the SAB meeting to provide assistance in responding to questions from the SAB.

#### Presentation by Lead Reviewers

Dr. Thorne thanked Dr. Khanna introduced the three lead reviewers for the draft report. Member provided preliminary comments<sup>2</sup> and they are available on the SAB webpage.

Dr. Robert J. Johnston was the first reviewer. The SAB panel report does an admirable job of describing a complex set of challenges for VSL meta-analysis, and the guidance in the SAB report is relatively comprehensive and technically accurate. Overall, the SAB report is excellent, and the panel includes multiple individuals with expertise in meta-analysis. He found that in nearly all cases the charge questions to the committee were adequately addressed. As described by the SAB report, there are concerns with EPA's proposed methods for updating mortality risk valuation estimates (as described in EPA's white paper, Valuing mortality risk reductions for policy: a meta-analytic approach). The SAB panel has identified most of these and has provided appropriate and detailed guidance. However, there are a few methodological issues which are either not addressed explicitly or are given too little emphasis by the SAB report. These relate to a divergence between the methods described in the agency's white paper and established approaches for economic meta-analysis, particularly related to issues such as publication bias, study screening, and the choice of methods used to meta-analyze the data.

The most important of these concerns relate to well-established publication bias in the VSL literature and its potential effects on the inferences that are drawn from both parametric and non-parametric meta-analysis. EPA's white paper gives inadequate attention to challenges of selection and publication bias. There should be a discussion of the importance of this bias for meta-analysis. This is important, because publication bias has been shown to be pronounced in the VSL literature.

As correctly noted by the SAB report, the EPA white paper describes and applies multiple methods that are inconsistent with (or have unclear relationship to) standard practice in the meta-analysis literature. The properties of these novel approaches are not established. There is a mature literature on different approaches towards meta-analysis. For example, there is guidance regarding the applicability of different types of parametric versus non-parametric methods, as influenced by factors such as heterogeneity in effect sizes and publication bias (Stanley and Doucouliagos 2012). Page 37 of the SAB report identifies one specific case, where standard tests of homogeneity (Q-tests) can be used to provide guidance regarding appropriate parametric and non-parametric methods. These tests provide insight into whether non-parametric methods are recommended to address study heterogeneity. The EPA's white paper would benefit from more systematic grounding in approaches of this type.

Dr. Elke Weber was the second reviewer and noted the committee systematically and thoroughly addressed the questions posed to it by the EPA White Paper. She agreed with Dr. Johnston's comments. My observations below simply complement a very good review from the perspective of behavioral decision theory and a couple of other angles.

While not explicitly asked to comment on a proposed change in terminology from the currently used label "value of a statistical life" (VSL) to two proposed alternatives ("value of risk reductions" (VRR) for mortality or "value of mortality risk" (VMR)), the committee wisely weighs in on the question. The report implicitly suggests that the first alternative (VRR) might be preferable, by mentioning it and not the other, as good decision in my opinion, but perhaps one that could be spelled out more explicitly (if intended) and with more justification. The proposed change in terminology derives from the fact that VSL can be misconstrued as a measure of the dollar value of avoiding certain death of a single individual and as violation of a tradeoff (money vs. human life) perceived by many to be a taboo or callous.

A cross-cutting issue that could be spelled out more explicitly is the fact that many of the study inclusion and data analysis procedures proposed by the EPA seem to be a response to the paucity of studies that provide ideal input into their meta-analysis. Thus their somewhat ad-hoc implementation of inclusion criteria can be seen as a tradeoff between two goals: (a) purity in applying a wide set of study selection criteria and (b) use of a sufficient number of studies/data to allow for reliable VSL or VRR estimates.

Dr. Peter J. Wilcoxon was the third reviewer. Overall he found the charge questions were addressed appropriately and with admirable thoroughness. He noted a few issues in specific responses where the committee argued that the question could not be answered from the information given. He noted these are described in his written comments.

For example, the committee takes the position that the charge question cannot be answered given the information provided by EPA. It then specifies what needs to be clarified, as well as discussing how validity should be assessed. The position that the charge question cannot be answered is appropriate and the answer is responsive. With that said, the advice provided could be clearer and more prescriptive. In places it seems to be internally inconsistent, such as on page 15, lines 41-44 which says “..the threshold for inclusion ... is not clearly stated in the White Paper. This is not a bright line decision, but a consideration of the weight of evidence...”

The response to Charge question 5 expresses reservations about transformations made by EPA when extracting data from some studies for use in the meta-analysis. This section could be clearer and less equivocal. It should also be made consistent with the response to Question 9, which discusses the same issues. In some places the text seems to argue some of the transformations are inappropriate for use in deriving the overall VSL and should only be used as part of sensitivity analysis around specific rules (line 4 and line 24). However, in other places it seems to acknowledge (at least implicitly) that without such transformations the set of studies that could be used for the meta-analysis would be very limited.

Overall, the intent of the section seems to be that: (1) some of the adjustments made by EPA are benefit transfers and thus not unambiguously appropriate as part of constructing the input data for the meta-analysis; (2) that some benefit transfers, or benefit transfers in some circumstances, could be appropriate; (3) that more analysis and evaluation will be needed to determine the answer to point 2, so no rule can be provided now; and (4) that in the interim, benefit transfer calculations should be identified more clearly and justified explicitly. If that’s the intent, the section should be revised to make that argument more clearly. If that’s not the intent, clarifying it is even more important.

Dr. Thorne thanked the lead reviewers and asked Dr. Khanna if she could respond. She noted that the inclusion of studies was discussed by the EEAC and validity of was complex. Dr. Boyle agreed that the scope test for inclusion of studies defined the validity of using a study and a recommendation could be to ask EPA to better define the parameters they use. Dr. Smith commented that the process for literature review was not clear in the white papers and the recommendation to the agency could include making a better distinction between meta-analysis and the set of criteria agency uses.

Dr. Khanna stated that the inconsistencies noted by the lead reviewers could be addressed. She noted that the charge to the SAB was to develop average national approach yet that may not be appropriate for all regulations. She suggested moving some of the text to a section in the report for more general or overarching issues

#### Chartered SAB Discussion and Disposition of the Report

Several members noted that there are over 50 recommendations in the report and the SAB needs to consider a way to identify the most important and significant recommendation rather than a raft of equally weighted recommendations that cannot all be addressed. Dr. Thorne suggested limiting the executive summary to identify only the high level recommendations. He further

expressed concern that we may be asking too much of the EPA and need to make the priorities clear in this and future SAB reports.

One member noted that the statistical analysis is standard and wondered if the available data supported the use of bayesian approaches. Dr. Khanna and Boyle replied that the Bayesian approach allowed smoother estimates and eases the addition of data as it becomes available and also addresses data quality.

Dr. Khanna noted that the report could be revised to prioritize the recommendation yet this would take some effort. The language in the report could be revised to be more specific for recommendations, and the recommendation could be categorized into short- and long term recommendation so the Agency can track and incorporate them as they are able to do so.

Dr. Thorne thanked members for their discussion and comments on the report. He reminded members that there are three options to finalize reports and suggested that the report can be revised to address the discussion by either himself and the panel chair or the two chairs and select group of SAB members. There did not appear to have a reason return the report to the panel. He opened the floor to entertain a motion.

Dr. Johnston motioned that the two chairs work and lead reviewers incorporate the revisions and finalize the report. Dr. Portier seconded the motion. Dr. Thorne entertained discussion on the motions and members were in agreement. The SAB unanimously agreed with no abstentions to gather to address

### **Work Group Review of Efficacy of Ballast Water Treatment Systems: a Report by the Science Advisory Board (EPA-SAB-11-009) <sup>3</sup>**

Dr. Thorne introduced this discussion of the Work Group's Review noting that the SAB Staff Office and SAB members received inquiries from some members of the former Ecological Processes and Effects Committee Augmented for the Ballast Water Advisory and a current SAB member regarding the and the information and analyses used to support the conclusions in the 2011 SAB report, *Efficacy of Ballast Water Treatment Systems: a Report by the Science Advisory Board*. He reminded members the SAB discussed this issue at its March 31, 2016 meeting and agreed to form a Work Group to report back to the Board. That Work Group has concluded its analysis prepared a memorandum that will be the starting point for the SAB discussion. He introduced Dr. Jeanne VanBriesen the Chair of the Work Group to present the findings.

Dr. VanBriesen acknowledged the efforts of her colleagues and introduced members of the Work Group: herself, Ingrid Burke, Joel Ducoste, James Mihelcic and Daniel Stram. The Work Group was charged with assessing whether the conclusions about shipboard treatment efficacy in the SAB report, *Efficacy of Ballast Water Treatment Systems: a Report by the Science Advisory Board*, were supported by the data that were provided to the panel. The purpose of the Work Group was to assist the SAB in considering whether or not to make a correction to the SAB report.

She noted that this was the first time the SAB has been asked to consider corrections to a final SAB report, the Staff Office drafted a process whereby the SAB may consider whether or not to make a correction to a final SAB report that has been transmitted to the EPA Administrator. The process was intended to be an avenue for correcting a final report that at the time of its release contained a substantial scientific error.

The Work Group members individually reviewed the conclusions of the Ballast Water Report, as well as associated materials and documents, held a public teleconference on August 12, 2016, and held several conference calls to discuss their individual evaluations and to address the charge question regarding the conclusions of the Ballast Water Report. The Work Group drafted this memorandum to summarize the results of this work. The SAB did not seek new data regarding ballast water treatment system efficacy, nor was any new data reviewed by the Work Group.

The Work Group considered the analyses presented in the final report and information gathered from the public teleconference. She noted the former Panel concluded that no technologies provided adequate information to support the assertion that they demonstrated an ability to meet any standard more stringent than current levels. This conclusion was based on the data reviewed and described in Chapter 4 and incorporating all the considerations with respect to sample size and analyses methods described in Chapter 3 and Appendix C of the final report.

The Work Group finds that the conclusions about shipboard treatment efficacy in the SAB report, *Efficacy of Ballast Water Treatment Systems: a Report by the Science Advisory Board*, were supported by the data that were provided to the former Panel. Further, the Work Group finds that the conclusions are supported by the analyses conducted by the former Panel, and these analyses are documented in the Ballast Water Report. In reaching this conclusion, the Work Group considered the Ballast Water Report and supporting materials available to the former Panel, meeting minutes and public comments from the former Panel deliberations, and materials and oral responses provided during the fact-finding.

She noted that the memorandum provides details of the qualitative interpretation of the report and suggestions to provide more clarity in SAB reports. For example, they found the technology assessment in Chapter 4 difficult to follow and the links between the conclusions drawn in Chapters 3 and 4 were not always clear.

The Work Group concluded that the issue brought to the SAB for its consideration represents a difference of opinion in the interpretation of the data and in the conclusions that can be drawn from the data available at the time of the Ballast Water Report. Such differences of opinion in methods of data interpretation and conclusions to be drawn from data analyses are not indications of error. The deliberations of the SAB, its panels and work groups are not intended to, nor could they be expected to, eliminate all such differences of opinion.

Dr. Thorne asked for concurrence on the recommendations presented by the Work Group. Board members unanimously concurred. Dr. Thorne then suggested the disposition of the Review of conclusions in *Efficacy of Ballast Water Treatment Systems: a Report by the Science Advisory Board* to develop a letter to the Administrator conveying the discussions. The SAB unanimously accepted the motion with no abstentions. Drs. Thorne and VanBriesen agreed to draft the letter to the Administrator the SAB concludes the Ballast Water Report does not contain a substantial

scientific error. The SAB finds that the report, Efficacy of Ballast Water Treatment Systems: a Report by the Science Advisory Board, presents sound scientific judgements using appropriate analyses and reasonable interpretation of the data available to the authoring panel.

### **Discussion of Planned Agency Actions in the Spring 2016 Regulatory Agenda and their Supporting Science**

Dr. Thorne briefly reviewed the purpose of the SAB's regulatory agenda science screening activity, which is to determine, as authorized by the ERDDAA, whether to review the adequacy of the science supporting the Agency's planned regulatory actions in the Semi-annual Regulatory Agenda. He introduced Dr. Charles Werth, Chair of the SAB Work Group on EPA Planned Actions for SAB Consideration of the Underlying Science, to review the recommendations from the Work Group and informed participants that the Work Group memorandum<sup>4</sup> contained background on this activity.

#### Presentation of the Work Group Recommendations

Dr. Werth reviewed the Board's statutory authority for screening the science associated with planned actions and the process used by the Work Group in evaluating available agency information to develop recommendations for the chartered SAB. He acknowledged the Work Group members; Drs. H. Christopher Frey, Kimberly Jones, Denise Mauzerall, Keith Moo Young, Surabi Menon, and Mr. Richard Poirot. He discussed the major planned actions that were the focus of SAB attention, the Work Group's recommendations, and supporting rationales. The Work Group recommended that no further SAB consideration was merited for eight actions:

- Implementation of the 2015 National Ambient Air Quality Standards for Ozone: Nonattainment Area Classifications and State Implementation Plan Requirements
- National Emission Standards for Hazardous Air Pollutants: Publicly Owned Treatment Works Risk and Technology Review
- Risk and Technology Review for National Emission Standards for Hazardous Air Pollutants From the Pulp and Paper Combustion Sources
- Trichloroethylene (TCE); Rulemaking Under TSCA Section 6(a); Vapor Degreasing
- Polychlorinated Biphenyls (PCBs); Reassessment of Use Authorizations for PCBs in Small Capacitors
- National Emission Standards for Hazardous Air Pollutants for Coke Ovens: Pushing, Quenching, and Battery Stacks
- Clean Energy Incentive Program Design and Implementation
- Portland Cement Risk and Technology Review

He informed the Board that the Work Group had initial fact finding regarding Risk and Technology Review for National Emission Standards for Hazardous Air Pollutants (RTRs). During the fact finding the Work Group members asked about the process the EPA uses to evaluate new technologies. Agency staff noted that these are conducted under the Clean Air Act Section 112(d)(6), also known as D6 technology reviews. The analysis reviews the MACT standard to determine if there have been developments in processes, practices or technologies are available and whether the MACT rule should be revised to reflect those developments. However, EPA staff emphasized that industries are not typically required to use a specific technology.

Rather, the EPA establishes an emission level based on the available technologies and the facilities can comply with those emissions levels by using the referenced technology or any other means that accomplish a similar degree of emissions control. The rules do not require a specific technology, they set an emission standard that the industry/facility must meet. Staff described that the process the agency uses includes stakeholder interviews, literature searches, information collection requests, site visits and other approaches to gather and analyze emission data and other relevant information to evaluate the available technologies and achievable emissions.

Dr. Werth also noted that EPA periodically seeks SAB review and advice on the specific enhancements made to the RTR risk assessment methodologies, particularly with respect to multipathway and environmental screening methodologies. Since the last SAB review was completed in 2009 the agency refined multipathway risk assessments, which 1) are conducted for a single facility at a time; 2) are very costly; 3) and can take several months to complete. Thus, we consider these screens to be an important step in the RTR risk assessment process that helps the agency to maximize the use of its resources and, when appropriate, to facilitate its communication with stakeholders. The Work Group suggested that the RTR review and a briefing of how the Agency addresses technologies should be presented together so the SAB can apply those findings to future RTR reviews.

Dr. Thorne asked if members had any questions for the Work Group. Members offered their thanks to the Work Group for the thorough review and for its analysis and its thoughtful report of recommendations.

Dr. Thorne asked for concurrence on the recommendations presented by the Work Group. Board members unanimously concurred. Dr. Thorne then suggested the disposition of the Board's Review of planned actions in the Spring 2016 Regulatory Agenda be for the Board to develop a letter to the Administrator conveying the deliberations noting offered a disposition to inform the Administrator of the SAB review which was accepted unanimously with no abstentions. Drs. Thorne and Werth agreed to draft the letter to the Administrator.

### **Update on EPA's Use of Behavioral and Social Sciences**

Dr. Elizabeth Corona, Office of Research and Development, Dr. Heather Klemick, Office of Policy, Mr. George Wyeth, Office of Enforcement and Compliance Assistance, and Ms. Nancy Grantham, Office of Public Affairs presented a panel discussion on the EPA's efforts to increase the use of behavioral, social, and decision sciences and case study of how the Agency applied those efforts in the Flint Michigan drinking water crisis.

Dr. Corona presented the Office of Research and Developments to Build Capacity in Social Sciences.<sup>5</sup> Her presentation addressed ORD's expansion of social science methods and data in our research. The group is cross-training scientist and conducting workshops to build internal and external partnerships as appropriate steps to integrate social science principles into ORD's research programs.

Dr. Klemick presented the National Center for Environmental Economics efforts to implement Executive Order "Using Behavioral Science Insights to Better Serve the American People. She

provided examples of messaging, information, improving forms, and training staff to utilize behavioral and social sciences.<sup>6</sup>

Mr. George Wyeth, Office of Enforcement and Compliance Assistance presented the EPA's effort to find non regulatory method to increase environmental compliance and stewardship through incentivizing and better understanding of behavioral patterns.

Nancy Grantham, Office of Public Affairs presented a case study of the agency's effort in Flint Michigan<sup>7</sup> Design for change: EPA communications driven by social sciences & community input. Her presentation recapped the steps a multi-agency, multidisciplinary team presented complex engineering solutions in straightforward messages to reestablish trust, engage the population in returning to use the public water system, and the lessons learned in the process.

### **Update on EPA Activities for Geologic Sequestration of Carbon Dioxide**

Dr. Thorne noted that SAB has discussed carbon capture and sequestration in several of the Reviews of the Regulatory Agenda and requested a briefing on the Agency's effort to use these techniques to reduce atmospheric carbon dioxide emissions. Dr. Mark DeFigueiredo, Office of Air and Radiation and Ms. Mary Rose Bayer, Office of Water presented an update on several of the EPA components to utilize geologic sequestration of carbon dioxide. Their presentation<sup>8</sup> addressed how the Underground Injection Control and Green House Gas Reporting Program fit into the regulatory and standard setting programs. They also outlined EPA's effort with other federal agencies.

Dr. Thorne thanked EPA staff and the SAB members for their thoughts and an interesting discussion. He noted we had reached the end of the agenda and reviewed actions items from the meeting and upcoming projects.

- He and Dr. Werth would develop a letter to the Administrator conveying the Board's discussion on the Spring 2016 Regulatory Agenda;
- He and the Dr. Khanna would address the Board's comments and finalize the SAB Review of EPA's Proposed Methodology for Updating Mortality Risk Valuation Estimates for Policy Analysis
- He and Dr. VanBriesen would develop a letter to the Administrator conveying the Board's discussion.

Dr. Thorne then turned to the DFO to adjourn the meeting. The DFO adjourned the meeting at 11:55 a.m.

Respectfully Submitted

Certified as Accurate

/s/

/s/

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Mr. Thomas Carpenter  
SAB DFO

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Dr. Peter S. Thorne  
SAB Chair

**NOTE AND DISCLAIMER:** The minutes of this public meeting reflect diverse ideas and suggestions offered by committee members during the course of deliberations within the meeting. Such ideas, suggestions, and deliberations do not necessarily reflect definitive consensus advice from the 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.

## Materials Cited

The following meeting materials are available on the SAB website, <http://www.epa.gov/sab>, at the page for the November 30 – December 1, 2016 Chartered SAB Meeting:

<https://yosemite.epa.gov/sab/sabproduct.nsf/a84bfee16cc358ad85256ccd006b0b4b/8023ed3815cb1dc885258052004d77ec!OpenDocument&Date=2016-11-30>

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- 1 Federal Register Notice Announcing the Meeting
  - 2 Comments from Members of the Chartered SAB on the Draft SAB Review of EPA's Proposed Methodology for Updating Mortality Risk Valuation Estimates for Policy Analysis (10/27/2016) as of 11/28/2016.
  - 3 Recommendations regarding ballast water treatment efficacy and conclusions in the 2011 SAB report, Efficacy of Ballast Water Treatment Systems: a Report by the EPA Science Advisory Board.
  - 4 Recommendations regarding major planned EPA actions in the Spring 2016 Regulatory Agenda.
  - 5 Building ORD Capacity in Social Sciences. EPA Office of Research and Development. Presented by Dr. Elizabeth Corona
  - 6 Behavioral & social science and environmental policymaking. EPA Office of Policy. Presented by Dr. Heather Klemick.
  - 7 Design for change: EPA communications driven by social sciences & community input. Presented by Nancy Grantham, Office of Public Affairs.
  - 8 Update on EPA Activities for Geologic Sequestration of Carbon Dioxide. Dr. Mark DeFigueiredo, Office of Air and Radiation and Ms. Mary Rose Bayer, Office of Water.

**Attachment A: Members of the Public Attending the Meeting**

November 30, 2016

Brittany Patterson, E&E Publishing

Pat Rizzuto, Bloomberg BNA

Brittany Patterson, E&E Publishing

Becky Fried, USEPA

Maria Hegstad, Inside EPA

Pat Rizzuto, Bloomberg BNA

December 1, 2016

Bruce Kobelski, USEPA

Sue Shallal, USEPA

Iris Goodman, USEPA

**Attachment B: Names of those who requested the teleconference call-in number**

Steve Gibb, Bloomberg BNA,  
Jessica Montanez, US EPA,  
John Steller, US EPA  
Kristina Friedman, US EPA  
Steve Risotto, American Chemistry Council  
Denise Sadler, Harvard University  
Scott Mathias, US EPA  
Yvonne Johnson, US EPA  
Nick Hutson, US EPA  
Alan Fawcett, US EPA  
Mark DeFigueiredo, US EPA  
Andy Miller, US EPA  
Bruce Kobelski, US EPA  
Carl Mazza, US EPA  
Amanda Reilly, Greenwire  
Sandra Evalenko, USEPA  
Debra Clovis, USEPA  
David Carr, Southern Environmental Law Center,  
Maria Hegstad, Inside EPA  
Dr. Kevin Boyle, Environmental Economic Advisory Committee  
Dr. Kerry Smith, Environmental Economic Advisory Committee  
Dr. George Van Houtven, Environmental Economic Advisory Committee

