

**U.S. Environmental Protection Agency (EPA)
Science Advisory Board (SAB)**

**Summary Minutes of the Public Meeting held on
November 12, 2020**

Meeting Participants:

Dr. John Graham, Chair	Dr. Robert Mace
Dr. Barbara Beck, Vice Chair	Dr. Clyde Martin
Dr. Rodney Andrews	Dr. Sue Marty
Dr. Hugh Barton	Dr. Thomas Parkerton
Dr. Deborah Bennett	Dr. Robert Phalen
Dr. Robert Blanz	Dr. Kenneth Portier
Dr. Todd Brewer	Dr. Mara Seeley
Dr. Joel Burken	Dr. Anne Smith
Dr. Janice Chambers	Dr. Richard Smith
Dr. John Christy	Dr. Jay Turner
Dr. Samuel Cohen	Dr. Brant Ulsh
Dr. Tony Cox	Dr. Donald van der Vaart
Dr. Alison Cullen	Ms. Carrie Volmer-Sanders
Dr. Otto Doering	Dr. Kimberly White
Dr. Susan Felter	Dr. Richard Williams
Dr. Joseph Gardella	Dr. Stanley Young
Dr. John Guckenheimer	

SAB Staff Office:

Dr. Thomas Armitage, Designated Federal Officer (DFO) for Chartered SAB
Mr. Thomas Brennan, Director, SAB Staff Office
Dr. Shaunta Hill-Hammond, DFO for SAB Economic Guidelines Review Panel
Ms. Khanna Johnston, Deputy Director, SAB Staff Office
Dr. Sue Shallal, DFO for SAB Reduced Form Tools Evaluation Panel

Other Attendees

See Attachment A.

Meeting Summary:

Convene the Meeting

Dr. Thomas Armitage, Designated Federal Officer (DFO) for the Chartered SAB convened the meeting and provided an opening statement. Dr. Armitage indicated that the SAB was meeting to conduct quality reviews of two draft SAB reports. Dr. Armitage noted that the Chartered SAB is an independent federal expert advisory committee chartered under the Federal Advisory Committee Act (FACA). He noted that the SAB is empowered by law to provide scientific and technical advice to the EPA Administrator and that SAB meetings and deliberations are

conducted in accordance with the requirements of FACA. Dr. Armitage indicated that the SAB Staff Office had determined that members of the Chartered SAB were in compliance with federal ethics requirements. He indicated that there was time on the meeting agenda to hear public comments and three individuals had registered to speak. Dr. Armitage noted that the meeting was being held remotely as a video conference and that members of the public could view the meeting via webcast or listen via telephone. Dr. Armitage indicated that all meeting materials were available on the SAB website. He indicated that these meeting materials included Chartered SAB roster,¹ and meeting agenda.²

Mr. Tom Brennan, SAB Staff Office Director, welcomed the meeting participants. He indicated that the EPA Administrator had appointed new SAB members. He identified and thanked the members who had completed their terms on the Board and identified the new members joining the Board. He welcomed the new SAB Chair, Dr. John Graham, and Vice Chair, Dr. Barbara Beck.

Purpose of the Meeting and Review of the Agenda

The SAB Chair, Dr. John Graham, welcomed meeting participants and noted that at the meeting the SAB would conduct quality reviews of two draft SAB reports: (1) SAB Peer Review of the EPA's Revised Guidelines for Preparing Economic Analysis³ (Guidelines), and (2) Review of EPA's Reduced Form Tools Evaluation.⁴

Dr. Graham reviewed the meeting agenda. He indicated that the Board would first hear public comments. He noted that after the public comment period, the Board would conduct quality reviews of the two draft reports. He indicated that all draft reports prepared by SAB committees and panels must undergo quality review and be approved by the chartered SAB before they are transmitted to the EPA Administrator.

Public Comments

Dr. Graham called individuals on the list of public speakers⁵ to provide oral comments. He asked each speaker to limit comments to three minutes.

Jason Schwartz, Institute for Policy Integrity (IPI), New York University (NYU)

Jason Schwartz of the Institute for Policy Integrity, New York University School of Law, expressed support for some of the findings and recommendations in the SAB draft report on EPA's revised Guidelines. He agreed that it was important to give weight to ancillary impacts. He disagreed with the recommendation to use an opportunity cost of capital approach to discounting, with rates as high as 7 percent, for intergenerational effects. He commented that this recommendation was inconsistent with OMB (Office of Management and Budget) advice, with EPA's past practices, and with legal standards for rational analysis. He commented that the OMB had indicated that use of 7 percent discount is not considered appropriate for intergenerational

discounting. He noted that the suggestion in the draft report to cut short the time horizon for analysis if rules will be periodically reviewed would arbitrarily cut out important future effects from analysis. In addition, he noted that the draft report provided inconsistent recommendations on retrospective review. He recommended that EPA prioritize review of rules to situations when changed circumstances or emerging science indicated that actual costs and benefits likely diverged from ex-ante estimates. Mr. Schwartz also referred the comments he had provided at previous SAB meetings on issues like unquantified effects, standing, the treatment of behavioral economics, the health-wealth tradeoff, and employment analysis. Written comments from Mr. Schwartz may be found on the SAB meeting webpage.⁶

Roy Gamse

Roy Gamse commended the members of the SAB Economic Analysis Review Panel for their work to review EPA's revised Guidelines. He noted that the Panel's report emphasized the need for the Guidelines to require analysis of ancillary benefits and risks, and he expressed support for this recommendation. He urged the SAB to include this recommendation in the letter to the Administrator with the report. Mr. Gamse reminded SAB members that, in their deliberation on EPA's proposed Clean Air Act benefit-cost rule, members had indicated that EPA's Guidelines were necessary to explain requirement in the proposed rule. Mr. Gamse recommended that, if EPA proceeded with its Clean Air Act benefit-cost rule, the rule should be issued simultaneously with or after finalizing the revised Guidelines. Mr. Gamse also recommended that a sentence in the draft SAB report regarding publicly available data (Section 2.5.3, page 26) be deleted. He also noted that he agreed with Jason Schwartz's comments on discounting rates. Written comments from Mr. Gamse may be found on the SAB meeting webpage.⁷

Hayden Hashimoto, Clean Air Task Force

Hayden Hashimoto of the Clean Air Task Force referred SAB members to comments he had provided at previous SAB meetings. He agreed with the SAB Panel's position on ancillary benefits and cost of illness. He suggested that the SAB add a question to the revised textbox discussion in the report to ask whether the regulatory impact analysis included a description or a decision on quantified benefits and costs. Mr. Hashimoto also commented on text in the draft report recommending that the Guidelines contain more discussion on the use of data and models. He noted the draft report indicated that in selecting models and underlying studies, the analyst should give a preference to models and studies where the documentation and data were publicly available. He indicated that the report also stated that there may be certain legal and other situations where the underlying data may not be publicly available because of confidentiality restrictions. In addition he noted the report stated that in such cases the regulatory impact analysis should explain the reasons for using these sources. Mr. Hashimoto pointed out the need for recommendations to provide greater clarity in addressing these issues in light of EPA's proposed in EPA's proposed Science and Transparency Rule.

Dr. Graham thanked members of the public for their comments and indicated that the Board would next conduct quality reviews of the two SAB draft reports. Dr. Graham stated that he had served as chair of the SAB panel that developed the report on EPA's revised guidelines for economic analysis. Therefore, Dr. Barbara Beck, Vice Chair of the Chartered SAB, would serve as the SAB chair for the quality review.

Quality Review of the SAB Draft Report on EPA's Revised Guidelines for Preparing Economic Analysis

Dr. Barbara Beck, Vice Chair of the Chartered SAB, described the process for conducting the quality review of the draft report on EPA's revised Guidelines. She indicated that the Board would first hear remarks from Dr. Al McGartland, Director of EPA's National Center for Environmental Economics. Dr. Beck indicated that, following the remarks from Dr. McGartland, the SAB would hear remarks from Dr. Graham, who had served as Chair of the SAB Economic Guidelines Review Panel. After remarks from Dr. Graham, the SAB would hear comments from SAB members who were assigned to be the lead reviewers of the report. She indicated that the lead reviewers of the report were: Drs. Alison Cullen, Otto Doering, and Anne Smith. Dr. Beck indicated that, following comments from the lead reviewers, the SAB would discuss the report and make a decision on disposition of the document. She indicated that the discussion of the report would focus on four quality review questions:

1. Whether the original charge questions to the SAB panel had been adequately addressed.
2. Whether there were any technical errors or omissions in the report, or issues that were inadequately dealt with in the Panel's report.
3. Whether the report was clear and logical.
4. Whether the conclusions drawn or recommendations provided were supported in the body of the Panel's report.

Dr. Beck asked SAB members if they had questions about the process. There were no questions so Dr. Beck asked Dr. McGartland to present his remarks.

Al McGartland, Director, EPA National Center for Environmental Economics

Dr. Al McGartland, Director of EPA's National Center for Environmental Economics, thanked the SAB for its review of the Agency's revised Guidelines. He indicated that staff from EPA's National Center for Environmental Economics were attending the meeting and could respond to questions. He noted that the Guidelines were an important resource that set forth best practices for economic analysis. He noted that much of the material in the document was not available in a textbook. He indicated that the Guidelines had last been updated in 2010 and he stated that EPA wanted to complete its latest revision of the document. He stressed the importance of receiving the final SAB review of the document as soon as possible.

Comments from the SAB Panel Chair – Dr. John Graham

Dr. John Graham, Chair of the SAB Economic Guidelines Review Panel, stated that EPA's revision of its Guidelines had been a major undertaking. He indicated that the Agency had incorporated significant improvements into the revised Guidelines and noted that the Panel had recommended additional specific improvements. He indicated that the Agency's charge to the Panel called for deliberation on the same set of questions for each chapter of the Guidelines, and therefore it had been challenging to minimize repetitiveness in the Panel's report while responding directly to all of the charge questions. He noted that another complete revision of the Guidelines might not be undertaken for a long period of time and the Panel wanted to provide recommendations that would be useful to EPA in developing its short and long term plans for development of the document.

Comments from SAB lead reviewers

Dr. Alison Cullen commended the EPA for its effort to prepare the revised Guidelines. She also commended the SAB peer review panel for its effort in conducting the review. She noted that the SAB peer review report and the Guidelines were lengthy and detailed.

Dr. Cullen indicated that, in general, the charge questions to the Panel had been adequately addressed. She provided some specific suggestions to improve the clarity and completeness of the report. She recommended that, as the draft report is edited, advice concerning issues that needed further attention be sharpened. In particular, she noted that more clarity was needed regarding the suggested definitions. Dr. Cullen commented that the tiered recommendations provided in the SAB peer review were well organized and helpful, but it was not clear which tier uncertainty analysis and distributional or variability analysis were meant to fall under.

Dr. Cullen indicated that in her written comments she had suggested clarifying specific parts of the report. She highlighted some of the clarifications provided in her written comments. She noted that the SAB report suggested that EPA generate prioritization rules for retrospective review where there are high costs or benefits with large uncertainties, but the SAB report did not define how high is "high" or how large is "large." Similarly, in Section 2.1.7 of the report, the EPA was encouraged to identify rules for retrospective review situations where the costs "vastly" exceeded benefits; however vastly was not defined.

Dr. Cullen noted that the section of the SAB report focusing on Chapter 3 of the Guidelines contained a recommendation to emphasize that regulatory impact analyses may, but are not required to, contain options that are not currently legal, and that this may be particularly true when economic theory pointed to clearly superior options than those allowed by law. Dr. Cullen indicated that this recommendation should be edited for clarity. She noted, for example, that in the recommendation it was not clear whether "clearly superior" meant "clearly economically superior" or superior in other senses?

Dr. Cullen indicated that a recommendation in the report concerning Chapter 8 of the Guidelines called for continually updating analytic approaches as various “frontier topics” became standard practice in the literature. Dr. Cullen suggested that the report specify how an analyst should gauge that something had become standard practice in the literature.

Dr. Cullen noted that the Panel’s report indicated that Chapter 8 of the Guidelines appeared to be silent on ancillary costs. She noted that the Panel’s report recommended developing a separate Guidelines section calling for a qualitative identification of ancillary costs associated with the rule-making action. Dr. Cullen commented that the SAB report should also provide information on how to discern when ancillary costs should be identified as opposed to when this simply added analytic complexity without analytic value. Dr. Cullen also expressed concern about an example provided in the Panel’s comments concerning Text Box 1. She noted that the current state of the climate is such that only over the very long term will greenhouse gas reduction be expected to lead to lower global temperatures.

Dr. Cullen indicated that, in general, the conclusions drawn and recommendations given in the SAB report were supported by text in the body of the report. She identified some parts of the report where citations were not included or where the arguments needed sharpening. In particular, she indicated that some of the issues addressed in Chapter Six of the Guidelines were subject to debate in the literature. One example she noted was the upper end discount rate for intergenerational benefits and costs. She questioned whether the SAB wanted to recommend a high end number of 7% based on the 2003 Office of Management and Budget A-4 circular rather than the 5% upper value that the Interagency Working Group on the Social Cost of Carbon carried in 2010. In addition, Dr. Cullen commented on the discussion of willingness to pay. She noted that groups may have, on average, different economic situations, income distributions, levels of baseline health status. She indicated that the reasons for these differences were complex and often rooted in structural and systemic inequity in the U.S. Dr. Beck then thanked Dr. Cullen and called for comments on the report from Dr. Doering.

Dr. Otto Doering noted that the review of EPA’s Guidelines clearly required a great amount of time and effort on the part of the Panel. He indicated that EPA’s Guidelines document was important and extensive. He indicated that the SAB review panel had done an excellent job completing a difficult task. He commended the members of the panel.

Dr. Doering indicated that the charge questions had been adequately addressed. He noted that there were no technical errors in the SAB report, but he raised some potential issues and suggestions for improvement. He indicated that the draft report was clear and logical. He also indicated that the conclusions and recommendations in the report were well-supported.

Dr. Doering provided other specific comments on the SAB report. He indicated that the Panel’s suggestion that EPA present all identifiable benefits and costs should receive more emphasis in the letter to the Administrator. He noted that the Panel’s argument for separation of analysis and policy making was blurred by the last question in the Textbox. He commented that critical

factors in policy making were transparency in the analytical process and the judgments made in executing the analysis. He also noted that it was not clear whether the Textbox on page 3 was provided as a checklist or as requirements.

Dr. Doering expressed support for the Panel's discussion of various tools on page 5, lines 1-3, and page 7 lines 8-10 of the report. He suggested that low probability high cost (or benefit) events might be important for particular consideration beyond retrospective review. With regard to the text on page 8, lines 34-34 and page 10, lines 38-39, he noted that it was difficult to draw a dividing line between potential and existing risk. He suggested that the report provide some additional explanation.

Dr. Doering noted that timelines were covered in Chapter 5 and Chapter 6 of the Guidelines document, but he did not see much information in the SAB report about technical change over the timeline of an analysis. He questioned whether this topic was adequately covered in the existing Guidelines. Dr. Doering commented that technical change could focus on a range of issues from compliance enhancing technology to learning curves. Dr. Doering noted that page 42, lines 12-18, of the SAB report addressed risk assessment. He questioned whether the topic of risk analysis was adequately covered in the Guidelines.

Dr. Doering noted that the Panel's suggestions for better organizing and focusing Chapters 7 and 8 of the Guidelines were particularly important and could be presented together. He also noted that on page 49, lines 20-32 of the SAB report, the importance of considering imperfect competition in regulatory impact analyses should be further emphasized. In addition, Dr. Doering indicated that the SAB report should emphasize the important role of uncertainty analysis in compliance decisions.

Dr. Doering indicated that on page 59 of the SAB report, the discussion should emphasize the need to address both differential impacts and distributional impacts. Dr. Doering also commented that the suggestion on page 68, lines 41-46 of the SAB report (to flex bounds of a regulation for sensitivity analysis) was extremely important.

Dr. Doering noted that the discussion in the SAB report of regulatory impact assessment did not appear to address the role and capacity of institutions to respond to regulations. He noted that there were instances where the regulatory impact assessment assumed technical assistance or enforcement capacity from institutions but that capacity did not exist. He indicated that regulatory impact assessments should account for this. Dr. Doering also commented on the need for a framework for incremental cost analysis of a rule change and indicated that a good example of this could be found in the 2012 National Research Council publication; *Review of the EPA's Economic Analysis of Final Water Quality Standards for Nutrients for Lakes and Flowing Waters in Florida*. Dr. Beck thanked Dr. Doering and called for comments on the report from Dr. Anne Smith.

Dr. Smith noted that her written comments addressed opportunities to highlight some of the points in the draft SAB report. She indicated that three points in the report could be highlighted: (1) the recommendation to define and separate the role of the analyst and policy maker; (2) the recommendation that benefit-cost information be provided for individual components of rules, particularly when rules are complex; and (3) the recommendation to use present value over full time horizons as the benefit and cost analysis metric.

Dr. Smith suggested that the SAB define the role of the analyst in supporting policy making. She noted that the analyst is responsible for providing information allowing policy makers to clearly understand support for their positions. She indicated that recommendation to provide benefit-cost information for individual components of rules was important and should be elevated to the transmittal letter to the EPA Administrator. She also suggested including in the report a more detailed explanation of this recommendation. Dr. Smith suggested that the recommendation to use present value over full time horizons as the benefit and cost analysis metric should also be in the transmittal letter to the Administrator. Dr. Smith indicated that she would provide some other specific edits for the report.

Response to comments from the Panel Chair

Dr. Beck thanked the lead SAB reviewers for their comments and asked Dr. Graham to respond to comments. Dr. Graham thanked the lead reviewers and noted that their suggestions would improve the SAB report. He addressed Dr. Cullen's comment on the Panel's position on heterogeneity of valuation. He indicated that the Panel could include additional references. He noted that the Panel did not focus on introducing non-economic factors for consideration. Dr. Graham indicated that Dr. Doering's comment on the dynamic of technology and cost effectiveness had been addressed in the EPA document and he noted that the Panel did not comment on that part of the document. With regard to Dr. Smith's comment concerning the use of annualized versus present value, Dr. Graham indicated that the Panel had concluded that use of present value was appropriate but it was not necessarily the only acceptable value. Dr. Graham then asked other SAB members who had served on the Panel if they wished to comment.

Dr. Richard Williams thanked the lead reviewers for their comments. He agreed with Dr. Smith's comment that the analyst should be responsible for preparation of information for decision makers, particularly with regard to direct and non-direct benefits. He agreed that additional information could be included in the SAB report to support the suggestion that analysts should evaluate options that were currently not "legal." He indicated that the foundation for this suggestion was the fact that at the onset of enactment of new regulations, regulatory offices often uncovered granular information about marginal benefits and costs which may not have been considered by Congress. He noted that this presented an opportunity to inform the President, designees, and Congress of any new potential measures to increase net benefits and not have EPA complete an illegal action. Dr. Williams also noted that examples of potential versus existing risks could be included in the report to address Dr. Doering's comments.

Comments from other SAB members

Dr. Beck asked other members of the Chartered SAB to provide comments on the draft report. A member asked what EPA assumed to be value of statistical life (VSL). Dr. Williams responded that dose-response functions and key information like the VSL were addressed separately. Another member asked if the wording of the sixth recommendation in the transmittal letter was correct. Dr. Williams indicated that it was and noted that the Panel preferred a comprehensive identification of benefits and costs.

Disposition of the report

There were no further comments so Dr. Beck explained the options before the Board regarding disposition of the report. Options included: (1) approving the report subject to editorial corrections by the SAB Chair, (2) approving the report with revisions subject to approval by the SAB lead reviewers and the SAB Chair, (3) returning the report to the SAB Panel for revision and repeating the quality review, and (4) constituting a new panel for the activity. A motion was made to revise the report as discussed and to send it to the SAB Chair and the lead reviewers for approval. The motion also called for sending the final report to members of the Chartered SAB for concurrence. The motion was approved unanimously by voice vote.

Quality Review of the SAB Review of EPA's Reduced Form Tools Evaluation

Dr. Graham indicated that the SAB would next discuss the report of the SAB Reduced Form Tools Review Panel. He noted that the report was titled, *Review of EPA's Reduced Form Tools Evaluation*. Dr. Graham indicated that the Board would: (1) hear remarks from Dr. Erika Sasser, Director of the Health and Environmental Impacts Division in EPA's Office of Air and Radiation; (2) hear a brief summary of the draft SAB report from Dr. Jay Turner, Chair of the SAB Panel, (3) hear comments from the SAB lead reviewers (Drs. John Guckenheimer, Clyde Martin, and Mara Seeley); (4) Dr. Turner would respond to comments from the lead reviewers; (5) the Board would hear additional comments from SAB members; and (6) the Board would make a decision on disposition of the report. Dr. Graham then reminded SAB members of the four quality review questions to be considered by the Board and called upon Dr. Sasser for remarks.

Erika Sasser, Director, Health and Environmental Impacts Division, EPA Office of Air and Radiation

Dr. Erika Sasser thanked the SAB for developing the draft report on EPA's reduced form tools evaluation and presented a series of slides.⁸ She indicated that full form models and reduced form tools were used to estimate the health benefits of Clean Air Act regulations. She noted that whenever possible, EPA estimated the anticipated impacts of a regulatory action using a state-of-the-science "full-form" approach. This approach involved evaluating: changes in emissions

based EPA's National Emissions Inventory and detailed models (e.g., IPM, MOVES); changes in air quality estimated from photochemical air quality models (e.g., CMAQ, CAMx); and resulting health impacts estimated from EPA's established benefits tool (e.g., BenMAP-CE). Dr. Sasser indicated that in certain instances, EPA had used "reduced-form" approaches, which employed simpler methods to approximate the more complex analyses. She indicated that the SAB had reviewed a report evaluating the use of reduced form tools relative to a full form approach. She noted that the SAB report would influence the ongoing efforts of EPA's Office of Air and Radiation with respect to the use of reduced form benefit tools in a regulatory context. She then addressed some of the SAB recommendations in the draft report and stated that the EPA would incorporate the recommendations into future evaluation work. She also indicated that the Agency planned to provide more transparency in the application of reduced form tools so the results could be reproduced.

Panel members asked Dr. Sasser and members of her staff a number of questions. A member asked why the full form models required a long time to run. EPA staff replied that more time was required to provide data to run full form models, in particular additional time was required to provide data adding regional specificity. Members asked what effort was needed to improve the reduced form tools. EPA staff indicated that it was necessary to make sure the approach was up-to-date and accurate.

A member noted that the EPA report reviewed by the SAB had been written by a contractor. He asked whether the document was considered to be an EPA report. EPA staff responded that the Agency had provided technical direction to develop the report. Another member asked whether the same methods could be used to verify full form and reduced form tools. EPA staff explained some of the differences between the full form models and reduced form tools. EPA staff indicated that, to verify the reduced form tools, the full form models were used to provide a baseline. EPA Staff noted that full form models were compared to observed data, whereas the outputs from reduced form tools indicated benefits, and were more difficult to corroborate.

Dr. Graham thanked Dr. Sasser for her presentation and called upon the SAB Panel Chair, Dr. Jay Turner, to provide introductory remarks about the Panel's report.

Comments from the SAB Panel Chair – Dr. Jay Turner

Dr. Turner provided brief introductory remarks. He indicated that evaluations using full form models were more time consuming than evaluations using reduced form tools. He noted that the EPA's report did not address when and how to use reduced form tools. He indicated that the EPA's report presented a comparison of reduced form tools and results derived under a variety of scenarios. Dr. Turner indicated that the quality review comments from members of the SAB were helpful. He stated that he would revise the Panel's report to incorporate the comments.

Comments from the SAB lead reviewers

The lead SAB reviewers commented on the Panel's report. Dr. John Guckenheimer expressed agreement with the conclusions in the Panel's report and indicated that the report could be used to help EPA improve the reduced form tools. He noted that one of the biggest differences between the full form models and reduced form tools was the extent to which they included weather input. He noted that only one of the reduced form tools used information from varying weather. He suggested including weather differences as input to reduced form tools to determine if extreme weather events had an impact. Dr. Guckenheimer also suggested using a systematic approach to identify the important key variables in the full form models and reduced form tools. He noted that sensitivity analysis could be helpful in this regard.

Dr. Clyde Martin indicated that the Panel had done a good job reviewing the EPA document and he expressed support for the Panel's report. He commented that parts of the Panel's report appeared to be too negative. He noted that reduced form tools were useful but one could not expect them to be as accurate as full form models.

Dr. Mara Seeley commented that the Panel's report was well written. She noted that the discussion of the AP3 direct vs. AP3 BenMAP reduced form tools should highlight the point that the discrepancy for the nitrate component was larger than discrepancies for other pollutants for all of the scenarios evaluated and that this was most notable for pulp and paper. She indicated that the Panel's report was clear and logical but she identified some specific sections of the report that could benefit from further explanation. She indicated that, in general, the conclusions in the report were supported by the report text and she provided some specific suggestions for additional explanation.

Response to comments from the Panel Chair

Dr. Turner thanked the lead reviewers for their comments and indicated the report could be revised to address the comments. In particular, he indicated that the observations about weather data were helpful. He agreed that further explanation and clarification of some parts of the report would be helpful and he noted that the report could reflect a more positive tone.

Comments from other SAB members

Dr. Graham asked other SAB members for comments on the Panel's report. A member noted that Exhibit 3-2 of the EPA report compared reduced form tools to full form models but there was no discussion in the EPA report indicating why reduced form tools overestimated or underestimated benefits. He suggested that the SAB report recommend that EPA provide more information and clarity about which errors and biases of the models were influencing results. He noted that this may be associated with granular information (e.g., geographic inputs). Another member suggested that the recommendations highlighted in the letter to the Administrator be more specific.

A member suggested that, if BenMAP included adverse health impacts, these should also be included in the reduced form tools. EPA staff indicated that BenMAP included direct health impacts only. EPA staff noted that secondary impacts such as employment effects were beyond the scope of reduced form tools. EPA staff indicated that consideration of such impacts required the use of different models. Another member commented that the recommendations in the letter to the Administrator should be more specific. A member suggested that model inputs be more transparently described. Dr. Turner noted that these model inputs were held constant but agreed that this could be clarified in the report. A member suggested establishing an open source community for reduced form tools. Another member commented that this could be difficult because some of these tools were developed by EPA and others were not. A member commented that EPA's modeling effort was an ambitious undertaking and he noted the variability of data in the emissions inventory used for the modeling.

Disposition of the report

Dr. Graham thanked SAB members for their comments. He noted it appeared extensive revision of the report was not needed. He then called for a motion on disposition of the report. A motion was made to have the Chair of the SAB Panel and the SAB Chair revise the report as discussed and send it to the four members of the Chartered SAB who served on the Panel (Drs. Anne Smith, Richard Smith, Tony Cox, and Alison Cullen) as well as Drs. Guckenheimer and Martin for review before it was transmitted to the EPA Administrator. The motion passed unanimously by voice vote. Dr. Graham asked the DFO if there was other business to complete before adjourning.

Meeting Adjourned

The DFO (Dr. Armitage) indicated that all items on the agenda had been addressed, thanked members for their participation, and adjourned the meeting.

Respectfully Submitted:

/s/

Dr. Thomas Armitage
Designated Federal Officer

Certified as Accurate:

/s/

Dr. John D. Graham
Chartered SAB Chair

December 16, 2020
Date

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.

Appendix A: Additional participants (who participated in the meeting via video conference, viewed the meeting via webcast, or the requested the call-in number to listen via telephone)

Name	Affiliation
Wes Austin	EPA
Bryan Bloomer	EPA
Jennifer Bowen	EPA
Karen Clay	Carnegie Mellon University
Chris Dockins	EPA
Pat Dolwick	EPA
Dave Evans	EPA
Robert Farrow	University of Maryland Baltimore County
Zaida Figueroa	EPA
Arthur Fraas	Resources for the Future
Timothy French	Truck and Engine Manufacturers Association
Roy Gamse	
Hayden Hashimoto	Clean Air Task Force
Gloria Helfand	EPA
Elke Hodson	OMB
Robin Jenkins	EPA
Heather Klemick	EPA
Elizaeth Kopits	EPA
Heather Kuoppamaki	Oregon DEQ
Alex Martin	EPA
Al McGartland	EPA
Stuart Parker	IWP News
Bryan Parthum	EPA
Stephani Penn	Industrial Economics, Inc.
Kelley Raymond	EPA
Sean Reilley	E&E News
Enrique Saenz	Indiana Environmental Reporter
Erika Sasser	EPA
Jason Schwartz	Institute for Policy Integrity, New York University School of Law
Nathalie Simon	EPA
Heather Simon	EPA
John Sorrels	EPA
Melissa Sullivan	EPA
Steve Via	American Water Works Association
Darryl Weatherhead	EPA
David Wegner	NAS-WSTP
Karen Williams	Oregon DEQ
Ann Wolverton	EPA
Daniel Yarborough	EPA
Molly Zawacki	EPA

Materials Cited:

All meeting materials are available on the SAB website (<http://www.epa.gov/sab>) at the page for the November 12, 2020 meeting. The direct web link is:

<https://yosemite.epa.gov/sab/sabproduct.nsf/a84bfee16cc358ad85256ccd006b0b4b/f4dadf0af02145f8852585df006ff4c3!OpenDocument&Date=2020-11-12>

¹ SAB Roster

² Agenda

³ SAB Peer Review of the EPA's Revised Guidelines
for Preparing Economic Analysis (dated September 17, 2020)

⁴ Review of EPA's Reduced Form Tools Evaluation

⁵ Registered Public Speakers (updated August 11, 2020)

⁶ Comments from Jason Schwartz, Institute for Policy Integrity, New York University School of Law

⁷ Comments from Roy Gamse on the SAB Review of EPA's Revised Guidelines for Preparing Economic Analyses

⁸ EPA Presentation: Remarks on SAB Review of the Reduced Form Tools Evaluation. Dr. Erika Sasser, EPA Office of Air and Radiation