

United States Environmental Protection Agency (U.S. EPA)
Science Advisory Board (SAB)
Advisory Meeting
January 21, 2014
Meeting Minutes

Date and Time: January 21, 2014, 1:00 p.m – 5:00 p.m. Eastern Time

Location: By telephone.

Purpose: to complete Board discussions of planned actions identified in the agency’s Fall 2013 regulatory agenda and their supporting science and to discuss possible future SAB advice related to EPA’s strategic priorities.

Meeting Participants:

SAB Members (See Roster¹)

Dr. David T. Allen, SAB Chair	Dr. Madhu Khanna
Dr. George Alexeeff	Dr. Nancy K. Kim
Dr. Ingrid Burke	Dr. Francine Laden
Dr. Edward Carney	Dr. Kristina Mena
Dr. Peter Chapman	Dr. Surabi Menon
Dr. Terry Daniel	Dr. James R. Mihelcic
Dr. George Daston	Dr. H. Keith Moo-Young
Dr. Costel Denson	Dr. Eileen Murphy
Dr. Otto C. Doering, III	Dr. James Opaluch
Dr. Michael Dourson	Dr. Duncan Patten
Dr. Joel Ducoste	Mr. Richard Poirot
Dr. David Dzombak	Dr. Amanda Rodewald
Dr. T. Taylor Eighmy	Dr. William Schlesinger
Dr. Elaine Faustman	Dr. Gina Solomon
Dr. R. William Field	Dr. Daniel Stram
Dr. Stephen Hamburg	Dr. Peter Thorne
Dr. Cynthia M. Harris	Dr. Paige Tolbert
Dr. Robert Johnston	Dr. Jeanne VanBriesen
Dr. Kimberly L. Jones	Dr. Peter Wilcoxon
Dr. Catherine Karr	

SAB Staff:

Dr. Angela Nugent, SAB Staff Office, Designated Federal Officer (DFO)
Mr. Christopher Zarba, Acting Director, SAB Staff Office

Other Attendees:

Attachment A lists members of the public who requested the call-in information for this meeting.

Meeting Materials:

All materials provided to the SAB for this meeting are available on the SAB website at: <http://yosemite.epa.gov/sab/sabproduct.nsf/a84bfee16cc358ad85256ccd006b0b4b/3ba3d4561adc643985257c4300587aec!OpenDocument&Date=2014-01-21>

Meeting Summary December 4, 2013:

Convene the meeting

Dr. Angela Nugent, Designated Federal Officer (DFO), formally opened the meeting and noted that this federal advisory committee meeting of the SAB had been announced in the Federal Register on December 24, 2013 (78 FR 77674-77675).² She briefly noted that the EPA Science Advisory Board (SAB) is an independent, expert 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 inform EPA's decisions. The DFO noted that the Federal Register notice announcing the meeting had provided the public with an opportunity to provide written and oral comment. There were 11 advance requests for oral comment and five sets of written comments^{3,4,5,6,7} submitted in advance of the meeting. She noted that there would be an opportunity for clarifying comments from the public or clarifying remarks from the agency. She asked that anyone wishing to provide such comments or remarks to inform her by email after the SAB concludes its discussions of the proposed EPA action *Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generation Units* (2060-AQ91) and before Board disposition of that action.

Dr. Nugent stated that the SAB consists entirely of special government employees (SGEs) appointed by EPA to their positions. As government employees, the members are subject to all applicable ethics laws and implementing regulations. The EPA has determined that advisors participating in this meeting have no financial conflicts of interest or appearance of loss of impartiality under ethics regulations specified in 5 CFR 2635 relating to the topics to be discussed at the meeting.

Goals and agenda for the meeting

Dr. David Allen, the SAB Chair, welcomed the group. He reviewed the agenda⁸ and stated that the goal of the teleconference was to reach decisions on: (1) a draft letter on the EPA Science to Achieve Results (STAR) Fellowship Program; (2) recommendations from the SAB Work Group on EPA Planned Actions for SAB Consideration of the Underlying Science; and (3) a draft letter to the EPA Administrator identifying priority themes of interest to the SAB.

Discussion of draft letter on the EPA Science to Achieve Results (STAR) Fellowship Program

Dr. Allen provided background on the development of the draft letter.⁹ At the December 4-5, 2013 meeting, the Board had decided to send a letter to the Administrator addressing changes to and the possible demise of the STAR fellowship program. Such a letter would note the important role STAR fellowship play in training future scientists.

Board members offered several suggestions to strengthen the draft letter. One member suggested adding a sentence to the end of the second paragraph to note that National Science Foundation (NSF) priorities do not align entirely with the EPA's priorities. Another member added that NSF has historically focused on environmental problems that were ecological in nature, rather than focused on human health, while the research of the National Institutes of Environmental Health Sciences is driven by "health issues around the environment." In contrast, he noted that the EPA is a mission-based organization charged with developing and implementing regulations that are concerned with both ecological and human health issues. The member stated that he had provided several detailed questions related to NSF management of the STAR program to the DFO and SAB Chair for possible inclusion in the letter. Other members cautioned that any letter should not state or imply that the NSF could not manage a research program that included both ecological and human health issues. Still other members suggested language regarding specific implementation steps the agency could take during this transition period and language that would offer the SAB's assistance to assist with the transition. A member suggested modifying the last question of the third paragraph to ask about how the EPA will interact with NSF to ensure that agency priority science needs would be addressed.

The SAB Chair responded to comments by agreeing that the second paragraph should more explicitly describe the EPA's unique research mission as compared with the NSF's mission and more clearly describe the SAB's concern about retaining the EPA research mission in the fellowship program under NSF management. He suggested that the letter should focus on the Board's concerns and not identify specific solutions to address those concerns. Instead, it would open dialogue with the agency to offer assistance as the agency considers this transition.

Members expressed favorable comments about this approach. One member suggested that the draft letter characterize more fully the range of environmental scientists whose work has been supported by the STAR fellowship program. A wide range of disciplines including social science, public health science, and epidemiology have been represented. Dr. Allen agreed to add brief language on this point.

Dr. Allen noted that there was a precedent for such a brief letter to be sent to the Administrator directly from the SAB Chair. He proposed to work with the SAB Staff Office to revise the draft letter expeditiously in light of comment received from Board members. He asked that any board member wishing to see the revised board letter before it is transmitted to the Administrator to contact the DFO indicating their interest. He stated that his goal was to transmit the letter to the Administrator within two weeks. He asked members to voice any concerns with this plan. There were no objections or proposed modifications identified.

Public comments on planned agency actions and their supporting science

Dr. Nugent introduced the eleven individuals providing oral public comment and noted that, following SAB practice, commenters would be provided three minutes for their remarks with the SAB Chair facilitating an opportunity for Board members to ask clarifying or follow-up questions.

The first public speaker was Mr. Timothy Gablehouse of Gablehouse Granberg, LLC. His comments addressed the complex environmental fate of chemicals that are sequestered. He noted that some chemicals interact chemically with ground water reservoirs and dissolve other chemicals in ground water and that sequestered chemicals can migrate underground. The

environmental fate of sequestered chemicals is site specific. He spoke of conditions west of the Mississippi, where there is a complex regulatory situation for sequestration because the individuals who own the surface land may differ from the individuals who own the pore space. Regulatory frameworks differ from state to state and underground injection rights, mineral rights and water rights depend on state laws.

The second public speaker was Mr. J. Edward Cichanowicz, an independent consultant speaking on behalf of the Utility Air Regulatory Group. He stated that the EPA's proposed regulation cited studies by the Department of Energy that were not adequately peer reviewed. He expressed concern that a 2007 NETL report was based on a sole proprietary database, which represented limited experience. He rejected EPA's comparison of the introduction of carbon capture and sequestration to the introduction of scrubbers that reduced emissions of sulphur dioxide, because much greater information about and experience with the latter technology existed prior to requirements for use of the scrubbers. He referred SAB members to his written statements provided to them before the meeting (see Minutes Endnotes 4 and 6).

The third public speaker was Mr. Michael McInnes from Tri-State Generation and Transmission Association, Inc. He stated that the studies supporting the EPA's choice of carbon capture and storage (CCS) as the best system of emission reduction show that the technology is costly and not proven at scale. Use of CCS technology would reduce plant output by 40 percent because, at 90 percent capture, CCS would require 40 percent of steam flow. More fuel would be required to achieve the pre-CCS output and more pollution from other byproducts would result. He also noted that sequestration sites would not be located near all electrical generating units using coal.

The fourth public speaker was Mr. Steven B. Kulig from the Jamestown Board of Public Utilities. He noted that CCS technology was not commercially viable or technologically feasible in western New York. The acreage required would be far more than any one entity could control.

The fifth public speaker was Ms. Theresa Pugh of the American Public Power Association. She provided information different from her public comment at the SAB's December 4-5, 2013 meeting. She noted that the EPA had informed the SAB that the agency's existing Underground Injection Control (UIC) rule addressed the cross-media effects of the proposed *Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units*. She stated that the EPA did not conduct a National Environmental Policy Act (NEPA) review, as required by the Clean Air Act, when it introduced the UIC rule, nor did the agency consider impacts on endangered species. She spoke of the potential for unexpected consequences from the requirement for use of CCS technology by coal-fired plants. She noted that all the studies cited were in the planning phase, not the operational phase, and questioned why the EPA considers that CCS is adequately demonstrated for coal-fired plants, while it has not made the same claim for power plants using natural gas or for factories.

The sixth public speaker was Mr. Lyle Witham of the Basin Electric Power Cooperative in the upper Great Plains. He described his Cooperative's experience with the Antelope Valley Demonstration project that led him to conclude that CCS is not currently commercially available or economically viable for traditional coal fired plants. An SAB member asked a clarifying question regarding the form of the stored carbon dioxide. Mr. Witham responded that generally the carbon dioxide is a liquid that is compressed and injected in a super-critical state. The liquid is sequestered in the ground and must be monitored for ruptures to check that it does not leak to the soil.

The seventh public speaker was Mr. Dan McNally of the Holland Board of Public Works in Michigan. He noted that he was involved in the Department of Energy research process and expressed agreement with previous speakers. Concerns about underground sequestration of carbon dioxide in the West are similar to those in Michigan.

The eighth public speaker was Mr. William Rogers of DTE Energy. He referenced his written comments (see Minutes Endnote 5) and noted that the NETL studies cited by the EPA do not reflect the range of conditions required to generate a power supply. He stated that the EPA's requirements will result in a 40% emissions increase in power plants. Introduction of the CCS technology is unlike past requirements for sulphur dioxide scrubbers, because the CCS technology is complex, involving 100 separate process steps, requiring multiple controls. An SAB member asked him to describe more explicitly what is most problematic in introducing CCS. Mr. Rogers responded that the challenge is to capture the carbon dioxide in nearly a pure stream. There are other products in a flue gas stream that need to be addressed and that can cause problems in terms of the scale and amount of material to be handled. CCS in coal-fired power plants is very different from the oil and gas industry. Another member asked about potential adverse effects resulting from CCS. Mr. Rogers responded that there would likely be no on-site storage. The waste stream will need to be sent by pipeline to areas with appropriate aquifers. This will involve piping over significant areas. Ms. Pugh noted that piping for high pressure carbon dioxide would be needed, able to handle 2,000 pounds of carbon dioxide per square inch.

The ninth public speaker was Mr. Jim Roewer from the Utility Solid Waste Activities Group, which includes a large proportion of the electrical generating units in the United States. He noted that the latest rule from EPA's Office of Solid Waste and Emergency Response exempted geological sequestration from hazardous waste regulation. This exclusion does not address potential liabilities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Carbon dioxide is not exempted as a hazardous substance under CERCLA if the carbon dioxide waste stream contains other hazardous constituents. This potential CERCLA risk will have a chilling effect on the adoption of CCS. Until potential liability questions for CCS are resolved, electrical generating units will encounter liability impediments in implementing geological sequestration.

The tenth public speaker was Mr. Fred Eames of Hunton & Williams, speaking on behalf of the CCS Alliance. He questioned whether the EPA presented the SAB with adequate evidence of peer-reviewed science supporting a proposed rule that may require millions of tons of carbon dioxide to be stored. He stated that such storage has never occurred in saline aquifers and noted that the SAB has a statutory duty to review the science supporting the proposed rule and provide advice to the EPA Administrator.

The eleventh public speaker was Dr. Dave Fraley from the City Utilities of Springfield, Missouri. He described his involvement in the shallow sequestration project in the Lamont formation. The goal of this project was to monitor and characterize the storage capabilities of an injection well in the Lamont formation over a decade. Researchers found that the geo-hydrology precluded local sequestration as an option because the lowest available aquifer had potable water. The project sought to explore other locations as options, but funding was not available.

Continuation of discussions of planned agency actions and their supporting science

The SAB Chair began the discussion by providing context and history for the teleconference discussion of the one remaining action from the Spring 2013 Regulatory agenda. He noted that the chartered SAB would: (1) receive a report from Dr. James Mihelcic, Chair of the SAB Work Group on EPA Planned Actions for SAB Consideration of the Underlying Science; (2) discuss the Work Group recommendations; (3) receive any additional clarifying comments that the public wishes to provide or clarifying remarks that the agency wishes to provide; and (4) discuss the disposition of the Work Group's recommendation.

Dr. Mihelcic then summarized the recommendations of the Work Group regarding the science underlying the EPA action *Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generation Units* (2060-AQ91).¹⁰ He thanked the Work Group members, EPA staff and public commenters for their assistance in developing the report.

He briefly summarized the timeline for development of the recommendations for the teleconference. He noted that the EPA informed the SAB of the publication of the Spring 2013 semiannual agenda on July 3, 2013. The Work Group was formed in August and conducted preliminary information gathering in August and September. The Work Group provided a report in November 2013 for discussion at the chartered SAB's face-to-face meeting on December 4-5, 2014, where the Board received input from the EPA and the public regarding action 2060-AQ91. The chartered SAB charged the Work Group to gather additional information on that action and the Work Group held a fact-finding call on December 17, 2013.

Dr. Mihelcic summarized the recommendation in the Work Group's January 7, 2014 memorandum. As stated on page 2, "The SAB Work Group recommends that the SAB not review the science supporting the Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generation Units (2060-AQ91). This recommendation is based on the (1) information provided on the Clean Air Act statutory requirements for feasible technology, the (2) status of carbon sequestration under the Underground Injection Control Program, and (3) additional information on the EPA peer review process. The Work Group finds that a review by the SAB would not provide additional benefit to the proposed rule." He also noted that the Work Group encourages the EPA to monitor "the post rule reality compared to its estimated construction of coal-fired power plants and carbon sequestration demand to ensure that the technologies are feasible and available to newly constructed electricity generating units to meet the new standards." He also stated that the Work group recommended improvements in the agency process for providing timely information to the SAB.

After Dr. Mihelcic had completed the report from the Work Group, the SAB Chair underscored that a key element of the Work Group's recommendation is the separation of carbon capture from carbon sequestration, because the proposed regulation focuses on capture. The new and emerging science relates to carbon sequestration, which the EPA informed the Board is regulated outside the purview of the Clean Air Act, the authority for action 2060-AQ91. Dr. Allen asked whether the Work Group discussed whether a capture technology is viable if there is nowhere for the capture materials to go. Dr. Mihelcic responded that the EPA increasingly made clear as the Work Group progressed from summer to late fall and winter that the action 2060-AQ91 addressed carbon capture, rather than sequestration. The EPA staff presented information to the Work Group suggesting that industry has 40 years experience with geological sequestration across the United States and that this technology has been evaluated since the 1990's. A Work

Group member added that the Work Group was informed that, with the level set at 1,100 pounds per megawatt hour for coal-fired electrical generating units, it is likely that new plants would be powered by natural gas without CCS, rather than coal.

Members of the chartered SAB made several comments and raised several questions. One member stated that it was appropriate for the SAB to express concern about unintended outcomes and unintended consequences from a requirement for geological sequestration of carbon dioxide. Other members asked about the basis for the Work Group's ranking of this action as "High" related to the criterion "Involves major environmental risks." Dr. Mihelcic explained that the ranking of high related to screening criteria for the action to show whether it merited a "high, medium or low level of interest," based on the EPA's description of the action. The ranking of "high" was awarded based on the action's relevance to the long-term risks associated with climate-change, rather than an evaluation of risks associated with the proposed technology. One member asked whether the Work Group considered the risks of transportation and storage of liquified carbon dioxide. Dr. Mihelcic acknowledged the public commenters' points on that issue and responded that agency representatives informed the Work Group that there are many decades of experience moving carbon dioxide long distance. One member asked whether the Work Group's characterization of risk was theoretical or real.

SAB members commended the Work Group for screening the action and for distinguishing policy considerations from scientific and technical considerations. A Work Group member suggested that language on page 3 of the memorandum be strengthened to state that the agency should monitor the post-rule reality and clearly identify the new technology that needs monitoring.

Another member asked if the Work Group had looked at the technical documents supporting the Underground Injection Control rules. Dr. Mihelcic responded that those rules were already in place and the Work Group did not examine those requirements or their supporting technical documents. Mr. Kevin Culligan of the EPA's Office of Air and Radiation stated that the Underground Injection Control rules had been in place for many years, but he had no information about the peer review of the science supporting these actions.

At this point in the discussion the SAB Chair explained that after the Board had made a determination on the action under discussion, the decision and supporting rationale will be documented in a letter to the Administrator. The Board used such a process in July 26, 2013 to document its discussions about EPA planned actions in the Fall 2012 Unified Regulatory Agenda and their supporting science.

The SAB then recessed for 10 minutes.

After the recess, the DFO informed SAB members that one agency representative wished to provide clarifying remarks and one public commenter wished to provide clarifying comments to the SAB.

Mr. Kevin Culligan from EPA's Office of Air and Radiation made several points. He noted the SAB's concern about the proposed rule's impact on coal. He stated that the agency was aware of the low cost of solar, wind and other sources of energy. The low cost of these alternative energy sources would lead to the utility sector not to build coal-fired plants, and in that context the EPA did not see this rule as having such a major impact on plans to build coal-fired plants. In regard

to the SAB's concerns "about risk," he observed that the EPA, the Department of Energy, and others agreed that CCS "needs attention." The five plants using CCS are in advanced stages of development and will inform the use of CCS as a technology to help address climate change. He also noted that legal considerations, not policy considerations, determined that the specific regulation under discussion was not addressing sequestration. The Clean Air Act addresses air pollutants. Other laws allow EPA to regulate underground storage. He also noted that the Clean Air Act required the agency to review New Source Performance Standards every eight years.

Mr. Lyle Witham of the Basin Electric Power Cooperative Board commented that the EPA had not addressed the question of scaling up from a pilot project to a commercial facility. He noted that existing pilot projects operate at no more than a 2,500 megawatt scale. There are major factors to address relating to both capture and sequestration at commercial scale, especially involving solvents and non-enhanced-oil recover sequestration.

After receiving these remarks and comments, SAB members had additional discussions. They discussed changing language in the Work Group memorandum to clarify that the Board's understanding of EPA's legal concerns, not the agency's policy decisions, led to the Board's focus on carbon capture as it considered the EPA's action 2060-AQ91. Members discussed the need to focus specifically on the action before the Board and not address, at this time, related topics such as the social cost of carbon. The letter to the administrator could mention potential risks of carbon dioxide escape in transport and storage and possible chronic and acute risks.

Dr. Allen proposed working with the SAB Staff to develop a letter that would: (1) describe the Board's responsibility under ERDDAA to review planned agency actions; (2) describe the deliberation process used by the Board; (3) incorporate the Board's decision at its December 4-5, 2013 meeting regarding the action "*Revision of 40 CFR Part 192 -- Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings and Uranium In Situ Leaching Processing Facilities*" (2060-AP43); (4) in regard to action 2060-AQ91, communicate that the Board defers to EPA's legal view that the regulation under consideration focused on carbon capture and that carbon sequestration was addressed by regulatory mechanisms other than the proposed rule. Based on that legal view expressed by the EPA, the SAB decided not to undertake further review of the scientific basis for this specific rule. The SAB also decided to express its strong view that research and information related to sequestration is linked in important systemic ways to the rulemaking and merits review by an entity like the National Research Council or the SAB.

SAB members then discussed the proposal. They noted that the letter should characterize sequestration as a complex issue, which by definition generates unintended outcomes. Members agreed that the letter should acknowledge that information from both the EPA and the Department of Energy should be considered in any review of sequestration and that the SAB's concern regarding sequestration should not be framed narrowly on a technological basis, but more broadly to communicate that the regulatory framework for sequestration should be based on science that ensures the protection of human health and the environment.

The SAB Chair asked for a motion regarding the development of this letter. Dr. Peter Thorne moved that the SAB Chair develop the letter as described and circulate it to SAB members who self-identify as reviewers. Dr. Peter Chapman seconded the motion. Dr. Allen asked Board members to email the DFO if they wished to review the letter before it was sent to the EPA Administrator. The motion was accepted unanimously with none abstaining.

Discussion of priority science themes to be communicated to the Administrator

Dr. David Allen introduced the discussion of priority science themes of interest to the SAB for possible communication to the Administrator (Draft 01/13/14).¹¹ These themes were derived from the Administrator's remarks at the December 4-5, 2013 meeting with the chartered SAB and remarks made by senior agency officials at that meeting. The goal would be to write a letter to the Administrator identifying major topics of interest to the Board and expressing a desire to work with the Administrator as she prioritized her science agenda.

Members of the chartered SAB made several comments about the proposed list of themes. One member asked that the language regarding decision-support tools include qualifiers that refer to "scientifically validated or empirically based tools." Another member emphasized the importance of focusing on the scientific basis for such tools, rather than possibly indicating that the SAB would help develop the tools. Members also cautioned that the letter should not suggest that the activities represent gaps in current EPA science or research. Another member suggested the importance of offering SAB assistance to reach out to scientific societies engaged in environmental education.

The SAB Chair asked for a motion regarding the development of this letter. Dr. David Dzombak moved that the SAB Chair develop the letter as described and circulate it to SAB members who self-identify as reviewers. Several SAB members seconded the motion. Dr. Allen asked Board members to email the DFO if they wished to review the letter before it was sent to the EPA Administrator. The motion was accepted unanimously with none abstaining.

The teleconference was adjourned at 4:35 p.m.

Respectfully Submitted,

Certified as Accurate,

/Signed/

/Signed/

Dr. Angela Nugent
SAB Designated Federal Officer

Dr. David T. Allen
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.

Attachment A: Members of the public attending the public teleconference:

Ryan Barry, Natural Gas Supply Association
Elizabeth Beck, Vectren
Bill Bissett, Kentucky Coal Association
Cathy Cash, Electric Co-op Today
Andrew Childers, Bloomberg News
Lloyd Cress, Kentucky Coal Association
Kevin Culligan, EPA
Barry Drost, SRPnet
Karen Frantz, GHG Reduction Technologies Monitor.
Donald Gilligan, NAESCO
David Leathers, Jamestown Board of Public Utilities
Joseph Manuppello, People for the Ethical Treatment of Animals
Erica Martinson, Politico
Carl Mazza, EPA
Dave Moss, Kentucky Coal Association
Karen R. Obenshain, Edison Electric Institute
H. Floyd Gilzow, Missouri Public Utility Alliance
Theresa Pugh, American Public Power Association
William W. Thompson, Northwestern.
Stephanie Tsao, Argusmedia
Linda Wilson, NY State

Materials Cited

The following meeting materials are available on the SAB Web site,
<http://www.epa.gov/sab>, at the page for the [January 21, 2014 teleconference meeting](http://www.epa.gov/sab):
<http://yosemite.epa.gov/sab/sabproduct.nsf/MeetingCalBOARD/3BA3D4561ADC643985257C4300587AEC?OpenDocument>

¹ Roster of SAB members

² Federal Register, (78 FR 77674-77675)

³ Comment from Jean Public

⁴ Public comments from E. Cichanowicz, Consultant to the Utility Air Regulatory Group

⁵ Public comments from William Rogers, DTE Energy

⁶ Statement of E. Cichanowicz, Consultant to the Utility Air Regulatory Group, to the Subcommittee on Energy and Power Committee on Energy and Commerce, United States House of Representatives, November 14, 2013

⁷ Public comments from Lyle Witham, Basic Electric Power Cooperative

⁸ Agenda

⁹ Concern about the future of the Science to Achieve Results (STAR) Fellowship Program (01/13/14 Draft Text)

¹⁰ Report from the SAB Work Group Chair regarding Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generation Units (2060-AQ91)

¹¹ Priority science themes of interest to the SAB for possible communication to the Administrator (Draft 01/13/14)