

Written Statement to the
Science Advisory Board
U.S. Environmental Protection Agency

**EPA Has a Statutory Responsibility to Use Properly Developed and
Reviewed Science**

PREPARED BY:

H. Christopher Frey, Ph.D.

**Glenn E. and Phyllis J. Futrell Distinguished University Professor
Department of Civil, Construction, and Environmental Engineering
North Carolina State University**

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I served on the EPA Science Advisory Board from 2012 to 2018. From 2013 to 2018, I served on the SAB's Work Group on EPA Planned Actions and thus am familiar with its evolution and actions. I was a member and chair of the chartered EPA Clean Air Scientific Advisory Committee (CASAC). Some years ago I was a member of the EPA FIFRA Scientific Advisory Panel. I have served on a panel of the EPA Advisory Council on Clean Air Compliance. I currently serve on a work group under the EPA Clean Air Act Advisory Committee.

By law, under the U.S. Code, Title 42, Section 4365,¹ (bold added) **"The Administrator, at the time any proposed** criteria document, **standard,** limitation, or regulation under the Clean Air Act [42 U.S.C. 7401 et seq.], the Federal Water Pollution Control Act [33 U.S.C. 1251 et seq.], the Resource Conservation and Recovery Act of 1976 [42 U.S.C. 6901 et seq.], the Noise Control Act [42 U.S.C. 4901 et seq.], the Toxic Substances Control Act [15 U.S.C. 2601 et seq.], or the Safe Drinking Water Act [42 U.S.C. 300f et seq.], or under any other authority of the Administrator, **is provided to any other Federal agency for formal review and comment, shall make available to the [Science Advisory] Board such proposed** criteria document, **standard,** limitation, or regulation, **together with relevant scientific and technical information in the possession of the Environmental Protection Agency on which the proposed action is based."**

In response, the SAB "may make available to the Administrator, within the time specified by the Administrator, its advice and comments on the adequacy of the scientific and technical basis of the proposed criteria document, standard, limitation, or regulation, together with any pertinent information in the Board's possession." This statement implies Congressional intent that the Administrator should be forthcoming with a time frame by which such advice and comment should be made available. Furthermore, the Board has investigative authority. For example,

¹ <https://www.law.cornell.edu/uscode/text/42/4365>

the board “shall avail itself of the technical and scientific capabilities of any Federal agency, including the Environmental Protection Agency and any national environmental laboratories.”

The SAB may be requested to provide advice not only by the Administrator, but also by “the Committee on Environment and Public Works of the United States Senate, or the Committee on Science, Space, and Technology, on Energy and Commerce, or on Public Works and Transportation of the House of Representatives.”

The SAB last met face-to-face a year ago. Following that meeting, the SAB sent three letters to the Administrator, of which two were dated June 21, 2018 and one was dated June 28, 2018.^{2,3,4} These letters advised the Administrator that, under the statutory mandate of the Environmental Research, Development and Demonstration Authorization Act of 1978 (ERDDA), the SAB identified several planned regulatory actions that merit scientific review by the SAB. These included:

- **Review of the 2016 Oil and Gas New Source Performance Standards for New, Reconstructed, and Modified Sources (RIN 2060-AT54).** Example of an issue of concern: **“the scientific and technical basis** for identifying and evaluating measures being reconsidered for methods to reduce emissions of greenhouse gases, including methane, and volatile organic compounds (VOCs) in the oil and natural gas industry **was not provided.”**
- **Review of the Clean Power Plan (RIN 2060-AT55).** Example of an issue of concern: “The scientific and technical basis for identifying and evaluating measures including heat rate improvement, and other options that are applicable to individual plants, is not specified in the announcements of the planned action.” Moreover, **EPA was evasive when asked fact-finding questions by members of the SAB**, in that EPA’s responses to such questions “did not address whether the EPA would seek updated information on measures that were included in the original CPP, or whether such information would be considered ISI [Influential Scientific Information] or HISI [Highly Influential Scientific Information], or, the nature of peer review procedures planned for any ISI or HISI.” The SAB found that **“Given the potential significance of the CPP with regard to addressing GHG emissions that endanger public health and welfare, and the myriad of potential best systems of emissions reductions, further SAB review of this matter is warranted to ensure the soundness of the scientific and technical basis for the action.”**
- **Review of the Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Generating Units (RIN 2060-AT56).** Example of issues of concern: “scientific questions and new analyses may arise regarding diversity of energy sources, reliability of energy sources, or capabilities to recover or utilize energy resources domestically.” The SAB further observed that

² Science Advisory Board (SAB) Consideration of EPA Planned Actions in the Spring 2017 Unified Agenda of Regulatory and Deregulatory Actions and their Supporting Science, EPA-SAB-18-001, Letter from M. Honeycutt to E.S. Pruitt, June 21, 2018.

³ Science Advisory Board (SAB) Consideration of EPA Planned Actions in the Fall 2017 Unified Agenda of Regulatory and Deregulatory Actions and their Supporting Science, EPA-SAB-18-002, Letter from M. Honeycutt to E.S. Pruitt, June 21, 2018.

⁴ Science Advisory Board (SAB) Consideration of EPA Proposed Rule: Strengthening Transparency in Regulatory Science, EPA-SAB-18-003, Letter from M. Honeycutt to E.S. Pruitt, June 28, 2018.

“The specific scope of technical issues to be addressed is not provided, such as regarding what fuels, co-firing, firing, gasification, control, steam cycle, sequestration, and other options might form the basis of determination of best systems of emissions reduction” and found that **“further SAB review of this matter is warranted to ensure the soundness of the scientific and technical basis for the action.”**

- **Reconsideration of Final Determination: Mid Term Evaluation [MTE] of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light Duty Vehicles (RIN 2060-AT77).** Issue of concern: EPA’s reconsideration of the MTE “relied extensively on public comment without peer review or independent evaluation or validation of claims made by public commenters.”⁵ As such, the reconsidered MTE was not based on a credible or unbiased assessment. **EPA was evasive in responding to fact-finding questions posed by SAB members** regarding what was the underlying scientific and technical basis for the MTE and regarding key technical issues to be addressed in the subsequent rule-making. More recently, the SAB Work Group on EPA Planned Actions has recommended that the **Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy (2060-AU09)** does not merit review if EPA and CARB agree on a harmonized rule, but does merit SAB review if EPA and CARB do not agree on a harmonized rule.⁶ The rationale for this recommendation should be more clearly explained and possibly reconsidered in favor of a finding that the planned action merits SAB review. **The key issue here is not the policy outcome but whether the rule is based on ISI and/or HISI and, if so, has the ISI and/or HISI been subject to appropriate review.**
- **Repeal of Emission Requirements for Glider Vehicles, Glider Engines, and Glider Kits (RIN 2060-AT79).** Issue of concern: Although EPA has claimed that this proposed rule is based merely on an interpretation of EPA’s authority to regulate under existing statutes, the agency cited a since-retracted and highly flawed study funded by a company that manufactures gliders that purported to find that glider trucks had lower emission rates than newly manufactured trucks, which is a patently absurd claim. According to SAB members, “The proposed rule lacks transparency regarding the sources of and basis for data regarding costs, emissions, life cycle implications, and safety,” “The proposed rule lacks rigorous analyses of pertinent technical and scientific issues, instead relying on summaries of comments submitted by the public that have not been independently assessed or validated,” “EPA relies on a study conducted by Tennessee Tech University (TTU)” that was subsequently withdrawn both by TTU and by the study sponsor, Fitzgerald Glider Kits and for which the underlying raw data and details of test methods were not publicly available, “EPA failed to take into account its own study, published 4 days after the proposed rule, that shows that glider truck emissions can be substantially higher than those from conventionally manufactured trucks,” and other factors.⁷

⁵ Preparations for Chartered Science Advisory Board (SAB) Discussions of EPA Planned Agency Actions and their Supporting Science in the Fall 2017 Regulatory Agenda, Memorandum from SAB Work Group on EPA Planned Actions to Members of the Chartered SAB and SAB Liaisons, May 18, 2018.

⁶ Preparations for Chartered Science Advisory Board (SAB) Discussions of EPA Planned Agency Actions and their Supporting Science in the Spring 2018 Regulatory Agenda, Memorandum from SAB Work Group on EPA Planned Actions to Members of the Chartered SAB and SAB Liaisons, April 25, 2019.

⁷ Ref. 5

- **The EPA failed to notify the SAB of the planned action for the so-called “Transparency” rule, which is a violation of proper procedure under ERDDA.**

The SAB requested a year ago that EPA be more forthcoming with information regarding planned actions to better enable the SAB to do its job under ERDDA. Specifically, “the SAB strongly recommends that the EPA enhance descriptions of future planned actions by providing specific information on the peer review associated with the science basis for actions and more robust descriptions of the scientific and technical bases for the actions.” In fact, in response to fact-finding questions last spring, EPA was often evasive in that it failed to provide forthcoming answers to direct questions and in several instances avoided communicating with SAB members via teleconference, instead preferring terse one-way written communications that were largely uninformative. **It seems that little has changed in a year.** In its April 25, 2019 memorandum, the SAB work group found, as it has in the past, that **“responses to fact finding questions were not comprehensive and participation in the scheduled teleconference was limited. EPA should provide such information in the initial descriptions provided to the work group.”**

The EPA Administrator failed to follow the law with regard to the proposed rule Strengthening Transparency in Regulatory Science (RIN 2080-AA14). The law is very clear that the Administrator “shall” make available to the SAB the proposed standard along with “relevant scientific and technical information... on which the proposed action is based” “at the time” such action is “provided to any other Federal agency for formal review and comment.” The so-called “Transparency” proposed rule was announced by EPA by press release on April 25, 2018 and published in the Federal register on April 30, 2018. Yet, as of June 28, 2018, the SAB had not received the legally mandated notification from the EPA administrator regarding this proposed rule, nor the relevant scientific and technical information on which the proposed action was based. **In fact, leadership at the EPA failed to properly engage not only the SAB, but also EPA career staff in the development of the proposed “Transparency” rule.**

Furthermore, given that it takes time to develop the scientific and technical basis for a proposed standard, **it has been a well established expectation that EPA will provide the SAB with advance notice in the form of a semi-annual list of planned actions, to provide the SAB with sufficient time to provide a review if needed.**⁸ Furthermore, this pre-existing process for engaging the SAB also enables EPA program and regional offices to anticipate the need to request scientific advice from the SAB in a timely manner.⁹

The chartered SAB, based on recommendations from its Work Group on EPA Planned Actions, adopted a process in 2013 for review of EPA major planned actions identified in the Unified Regulatory Agenda on a semi-annual basis. **The Work Group has consistently, since 2013, applied several factors to determine whether a planned action merits review by the SAB.** Among the considerations are whether a planned action is based on influential scientific information (or highly influential scientific information) and, if so, whether there is an existing

⁸ Preparations for Chartered Science Advisory Board (SAB) December 4-5, 2013 Discussions of EPA Planned Agency Actions and their Supporting Science in the Spring 2013 Regulatory Agenda, Memorandum from SAB Work Group on EPA Planned Actions to Members of the Chartered SAB and SAB Liaisons, November 12, 2013.

⁹ E.g., “Preparations for Chartered Science Advisory Board (SAB) Discussions of EPA Planned Agency Actions and their Supporting Science in the Fall 2017 Regulatory Agenda,” May 18, 2018 memorandum from Alison Cullen to Members of the Chartered SAB and and SAB Liaisons.

appropriate and adequate plan to obtain peer review for such information. It is typically only in cases for which an EPA planned action is based on influential scientific information and for which EPA has failed to arrange for an appropriate and proper peer review that the SAB would recommend that a planned action merits SAB review. **However, particularly in the last two years, EPA has been uncommunicative regarding the scientific content of planned actions, leading to several situations in which the SAB has been unable to make a determination of whether a planned action merits SAB review.**

The proportion of planned actions for which the SAB has recommended to the Administrator that there be SAB review has been noticeably high since 2017.

Approximately 10 months after the SAB sent letters to the Administrator, the Administrator responded in an April 19, 2019 letter.¹⁰ This nearly 10 month delay reveals a strategy of attempting to ‘run out the clock’ as a means for avoidance of issues raised by the SAB.

With regard to the Administrator’s letter, the following key points need to be made:

- **The so-called “Transparency” proposed rule was developed in a highly non-transparent manner, without adequate input from EPA career staff and without advance notice to the SAB,** which is the very advisory committee that EPA should have engaged in advising on the issues of scientific methodology that the proposed rule attempts to address. **It defies logic that EPA political leadership bypassed EPA’s own scientific staff and scientific advisors to cobble together, in a rushed and secretive manner, a rule that pertains to how science should be done at a science-based regulatory agency.**
- **The April 19, 2019 letter states that EPA will provide briefings to the SAB shortly after the release of major proposed regulations. The SAB should be informed of the planned actions no later than the time that they are sent for review by other Federal agencies, but to allow adequate time for identification, development, and review of the science, EPA should provide advance notice to the SAB well before a rule is proposed so that the influential scientific information underlying the proposal is properly reviewed before the proposal is made. Proposed rules should be based on properly reviewed scientific information. Waiting until a rule is proposed to brief the SAB is de facto ‘running out the clock’ on the ability of SAB to engage in review, if a planned action merits SAB review.**
- The Administrator states, without any support, that detailed templates used by SAB work group members (presumably the SAB Work Group on EPA Planned Actions) duplicate other agency efforts and “increase the likelihood of inconsistency.” This is unsubstantiated. The templates developed and used by the SAB work group are for the specific purpose of assessing whether a planned action merits SAB review. It is reasonable and appropriate for SAB members to interpret information provided by EPA and obtained from other sources with respect to criteria developed within the SAB. It is also reasonable and appropriate for the SAB to have a work group to vet and frame issues before they brought to the full board.

¹⁰ Letter from EPA Administrator A. Wheeler to SAB Chair M. Honeycutt, April 19, 2019.

- **It is not adequate for EPA to offer to brief SAB after a proposed action has undergone inter-agency review. The development and review of science takes time.** The SAB requires adequate advance notice to have sufficient time to determine whether SAB action is merited and, if so, the nature of that action, as well as to undertake the needed action. The EPA also needs adequate time to identify ISI or HISI and assure that it has undergone appropriate review, which could be via the SAB or could be done in other ways, as appropriate. To the extent that the EPA fails to obtain appropriate review of ISI or HISI underlying a planned action, then the SAB would find that such a planned action merits SAB review. The Administrator should respond in a timely and forthcoming manner to such a finding, rather than wait 10 months.
- **While the Administrator may seek advice from any other appropriately cognizant EPA advisory committee, this does not relieve the Administrator of the statutory requirement under ERDDA to provide SAB with information as required by statute so that the SAB may determine whether a planned action merits SAB review.**
- The review of a planned or proposed action by SAB is not mutually exclusive with a review by other EPA advisory committees, such as the Clean Air Act Advisory Committee (CAAAC). Thus, **if the Administrator wishes to obtain advice from CAAAC, the Administrator may do so, but this has no bearing on whether an SAB review is needed.**
- **CAAAC is a stakeholder, not scientific, committee.** CAAAC membership includes representatives of regulated industries and other stakeholders with a vested interest in the policy outcomes of standard setting. CAAAC is chartered to deal with “policy and technical issues associated with implementation of the Clean Air Act (the Act).”¹¹ Although CAAAC is chartered under the Federal Advisory Committee Act, it does not have any specific statutory mandate under the Clean Air Act or other statute such as ERDDA. In contrast, **EPA is required under ERDDA to submit for SAB consideration information regarding planned actions so that the SAB may determine if such planned actions require scientific review. EPA cannot bypass this legal requirement to engage with the SAB simply because it wishes to also obtain advice from CAAAC.**
- **The nomination criteria for membership on CAAAC do not include scientific expertise.**¹² **As such, CAAAC is not the appropriate forum for review of scientific issues.**
- The fact that the SAB focuses on scientific issues and does not provide policy advice is a strength rather than limitation. **It would be arbitrary and capricious for the Administrator to refuse to follow the law by not providing the SAB with sufficient time to provide input on scientific matters that are within its statutory mandate and charter.**
- **Given that the proposed so-called “Transparency” rule was developed in a flawed manner, without appropriate scientific input from EPA career staff, the EPA should request a full SAB review of the proposed rule, or any updated concepts for a revised proposal of such a rule, before proceeding with a rule-making.**
- **EPA cannot argue that SAB review is not required simply because the Administrator may have consulted another FACA committee.** The EPA is required to follow ERDDA and should respond in a timely and forthcoming manner to SAB advice that a planned action merits SAB review. The EPA cannot justify that an SAB review of a planned rule,

¹¹ https://www.epa.gov/sites/production/files/2016-11/documents/caaac_charter_2016.pdf

¹² https://www.epa.gov/sites/production/files/2016-09/documents/nomination_form_2017.pdf

such as RIN 2060-AT54 and RIN 2060-AT90, is not warranted simply because it decides to go elsewhere (i.e. CAAAC) for a policy review. EPA should justify that a review by SAB is not needed on the premise (if valid) that these planned actions do not have any ISI or HSI or that, if they do, such ISI or HSI have undergone the appropriate scope and rigor of peer review.

- EPA should brief the SAB on Review of the Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Generating Units (RIN 2060-AT56) and, in particular, provide information on what alternatives were evaluated in determine the Best System of Emission Reduction, whether the evaluation was based on ISI and/or HSI and, if so, what scientific review was conducted.
- Whether EPA “believes” that the CAAAC “would be more appropriate” as a venue for advice on the proposed Safer Affordable Fuel-Efficient Vehicles Rule is irrelevant to whether this proposed rule requires scientific review by the SAB under ERDDA. **ERDDA does not state that the EPA may choose other committees in lieu of the SAB with respect to scientific review of planned actions.**
- With regard to the planned action pertaining to so-called “gliders,” EPA has made specious scientific and technical claims in its original proposal to repeal emission requirements for these vehicles, with extensive reliance on a since discredited study. **The idea that a glider truck, for example, would have lower NO_x and PM emission rates than a newly manufactured truck subject to the latest standards and emission controls demonstrates that the proposed rule was untethered from reality. The EPA should seek advice from the SAB to make sure that the scientific basis of any proposed rule, especially one as controversial as the glider proposed rule, is valid.**

With regard to EPA’s announced intention to update the 2005 Guidelines for Carcinogenic Risk Assessment, this is a complex and science-based undertaking that requires extensive input from EPA career staff, as well as from the agency’s external science advisors. **The SAB should undertake an assessment of changes in the state of science that would underly possible revisions to the Guidelines before changes to the Guidelines are proposed.** Furthermore, for a matter with such broad scientific and policy implications, it is also common to commission the National Research Council to frame the key scientific issues and provide recommendations. In any case, this is not a matter that can be rushed to meet arbitrary deadlines if it is to be done in a scientifically appropriate manner and in good faith.

Recent efforts by EPA to redefine how benefits assessment is conducted should be subject to expert review by a properly constituted review panel. As a matter of basic objectivity and fairness, such assessments should account for all benefits and all costs, to the extent practicable given available data and inference methods.

The SAB should be an advocate for the use of science in the EPA, for example, by calling out the censoring of science on EPA webpages and infringement by political leadership on the scientific work of career staff.^{13, 14}

¹³ The website www.epa.gov/climatechange no longer exists.

¹⁴ For example, under “Climate Change Research Fact Sheets,” the Air and Energy Research Overview Fact Sheet omits any work related to climate change, whereas this program used to be the Air, Climate, and Energy research

Finally, although the SAB should be the proper forum for EPA to obtain advice regarding the scientific basis of its regulatory and other programs, recent changes to the criteria for appointing members to the SAB, and the adoption of those criteria by Administrator Pruitt and Administrator Wheeler, undermine the credibility of the SAB itself. An October 31, 2017 memo from former EPA Administrator Scott Pruitt requires that members of EPA federal advisory committees should “reflect prominent participation from state, tribal, and local governments,” and that **priority should be given to “geographic diversity.”**¹⁵ There is no mention of the importance of having experts of high stature that represent the wide range of scientific disciplines, and the depth of knowledge and experience, necessary to the work of committees such as the EPA Scientific Advisory Board (SAB).

The memorandum states that “no member of an EPA federal advisory committee currently receive EPA grants,” but that this “principle should not apply to state, tribal, or local government agency recipients of EPA grants.” **This is illogical for several reasons.** One is the obvious inconsistency of implying that receiving a grant creates a conflict of interest for one but not another class of persons. The second is the longstanding recognition that receipt of a peer-reviewed scientific research grant, for which the Agency does not manage the work nor control the output, is not a conflict of interest. Per the Peer Review Bulletin of the Office of Management and Budget (OMB): “When an agency awards grants through a competitive process that includes peer review, the agency’s potential to influence the scientist’s research is limited. As such, when a scientist is awarded a government research grant through an investigator-initiated, peer-reviewed competition, there generally should be no question as to that scientist’s ability to offer independent scientific advice to the agency on other projects.”¹⁶ A 2013 report (Report No. 13-P-0387) by the EPA Office of Inspector General reaffirmed that receipt of an EPA research grant is not a conflict of interest.¹⁷ However, there can be situations in which a member of an advisory committee should recuse themselves from discussions that might pertain to their own work. Thus, third, the SAB has had recusal policies in place for dealing with this issue and situations in which a member’s work may come up for deliberation. **Finally, the memorandum does not acknowledge that persons with financial or professional ties to regulated industries or ideological organizations have, at the very least, the appearance of conflict of interest.**

The October 31, 2017 memo calls for **greater turnover in membership** of EPA advisory committees but fails to acknowledge that there are benefits of continuity and knowledge provided by having some previous members continue to serve. Under this new policy, well-qualified scientists have been “rotated” off of EPA advisory committees, in favor of new

program.

https://www.epa.gov/sites/production/files/2018-05/documents/air_and_energy_research_program_fact_sheet_-_may_2018.pdf

¹⁵ Pruitt, E.S., “Strengthening and Improving Membership on EPA Federal Advisory Committees,” Memorandum, U.S. Environmental Protection Agency, October 31, 2017.

¹⁶ Bolten, J.B., “Issuance of OMB’s “Final Information Quality Bulletin for Peer Review,” Memorandum, Office of Management and Budget, Executive Office of the President, Washington, DC, December 16, 2004.

¹⁷ EPA, “EPA Can Better Document Resolution of Ethics and Partiality Concerns in Managing Clean Air Federal Advisory Committees,” Report No. 13-P-0387, Office of Inspector General, U.S. Environmental Protection Agency, Washington, DC, September 11, 2013.

members without prior committee experience, selected instead for their affiliation or geographic location.

EPA's lack of commitment to science is evident not only with the recent changes to the SAB but based on its interference with the proper function of the CASAC and its expert panels.^{18, 19, 20}

The SAB and other EPA scientific advisory committees should be constituted based primarily on scientific expertise, should include active researchers, should not exclude research grant recipients, and should include a sufficient number of members with previous experience to ensure continuity and to avoid inefficiencies related to lack of experience.

¹⁸ Frey, H.C., J.M. Samet, A.V. Diez Roux, G. Allen, E.L. Avol, J. Brain, D.P. Chock, D.A. Grantz, J.R. Harkema, D.J. Jacob, D.M. Kenski, S.R. Kleeberger, F.J. Miller, H.S. Neufeld, A.G. Russell, H.H. Suh, J.S. Ultman, P.B. Woodbury, and R. Wyzga, "CASAC Advice on the EPA's Integrated Review Plan for the Ozone National Ambient Air Quality Standards (External Review Draft)," 24 page letter with 42 pages of attachments, submitted to Chair, Clean Air Scientific Advisory Committee, U.S. Environmental Protection Agency and to Docket EPA-HQ-OAR-2018-0279, November 26, 2018.

¹⁹ Frey, H.C., A.V. Diez Roux, J. Balmes, J.C. Chow, D.W. Dockery, J.R. Harkema, J. Kaufman, D.M. Kenski, M. Kleinman, R.L. Poirot, J.A. Sarnat, E.A. Sheppard, B. Turpin, and S. Vedal, "CASAC Review of EPA's Integrated Science Assessment (ISA) for Particulate Matter (External Review Draft – October 2018)," 34 page letter and 100 pages of attachments submitted to Chair, Clean Air Scientific Advisory Committee, U.S. Environmental Protection Agency and to Docket EPA-HQ-ORD-2014-0859, December 10, 2018.

²⁰ Frey, H.C., A.V. Diez Roux, P. Adams, G. Allen, J. Balmes, J.C. Chow, D.W. Dockery, J.R. Harkema, J. Kaufman, D.M. Kenski, M. Kleinman, R. McConnell, R.L. Poirot, J.A. Sarnat, E.A. Sheppard, B. Turpin, and S. Vedal, "03-07-19 Draft CASAC Review of EPA's Integrated Science Assessment (ISA) for Particulate Matter (External Review Draft – October 2018)," 19 page letter submitted to Chair, Clean Air Scientific Advisory Committee, U.S. Environmental Protection Agency, Washington, DC, March 27, 2019