

**Preliminary Comments from Members of the Chartered SAB on the SAB
Draft Report *SAB Review (11/20/2014) of the EPA's Draft Technical Guidance
for Assessing Environmental Justice in Regulatory Analysis***

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Comments from lead reviewers

Comments from Dr. George Alexeeff

Overall Impression:

I was impressed by the holistic nature and specificity of charge questions that have been well thought through and directed at the critical issues of the guidance document (EJTG). I was further impressed with the quality of the answers to those charge questions in the panel's report. The panel's draft report is thorough and detail-oriented with an excellent Executive Summary that captures the major strengths and weaknesses of EPA's document.

The review report is 42 pages long on a document of 52 pages which clearly indicates there are still a number of improvements that could be made to the EJTG – suggesting that the EJTG requires substantial revisions taking into consideration the comments and recommendations of the panel's report along with public involvement. However, the panel's review is supportive of the EJTG with substantial revisions as reflected in the statement: the "EJTG is a comprehensive compilation and presentation of environmental justice concerns and the complex issues, factors, parameters, processes and methods." However, I suggest the panel's report could provide clearer direction and a little more detail in the structure of the revisions as discussed below.

The panel's report correctly stresses the importance of additional clarity in the EJTG. For example, the report stresses the need for providing clear definitions of important terms (such as baseline, disproportionality, EJ population, etc.). The panel's report identifies some significant short-comings when it says "the recommendations are too broad" (page 2, line 5) and the EJTG "should provide more guidance on incorporating qualitative data in EJ analysis" (page 2 line, 28). Another significant recommendation is that public involvement needs to be incorporated more into the EJTG. The report also raises issues of transparency and accountability and how over stressing the uncertainty factors or limitations could lead to inaction. The section related to quantitative versus qualitative analyses is very well written and the recommendation to avoid bias toward the former and not favor one over the other is correct and well justified.

The report's quality can be improved by articulating clearly (instead of implying) that Cumulative Impacts Assessment is different from Cumulative Risk Assessment and that the former is better suited for place and community based analysis in the context of EJ as done in California with the CalEnviroScreen. Similarly, the report discusses in detail the limitations of the Risk Assessment model clearly implying that this is not the right approach to evaluate EJ concerns, but ends up making a statement "may not be suitable for assessing complex EJ concerns" instead of using the word "is". The report also implies that exposure characterization may be better suited than risk assessment, but needs to articulate this point clearly. In addition, the quality of the report can be strengthened by not mixing the use of words "risks and impacts" as being the same and explaining the difference between the two.

Were the original charge questions adequately addressed?

The panel's review addressed the question of overall clarity and technical accuracy. The panel provided detailed and satisfactory answers to all charge questions posed. The depth of knowledge and expertise of the panel is reflected by the critique of some key issues such as Risk

Assessment Model, Differential versus Disproportionate Impacts, Contributors and Drivers, and Distribution of Costs. The recommendations are correct and well justified. Hopefully, EPA will take these recommendations seriously and redraft the document accordingly. This effort would be very challenging and time consuming since some recommendations require fundamental changes in the framework and approach – defining disproportionality or moving the analyses in the direction of cumulative impacts or exposure instead of following the risk assessment paradigm.

In response to the charge questions the panel recommended a number of substantive changes to the EJTG. These include:

- improve clarity with detailed examples and more specific guidance;
- provide clear guidance how qualitative data can be used in the analysis;
- include more case studies, best practices, and guiding principles;
- incorporate alternative approaches to risk assessment;
- prepare guidance on identifying an appropriate control comparison population;
- provide guidance to ensuring that the public is involved in an EJ analysis;
- reduce the stated bias in the EJTG toward quantitative analysis;
- provide more specific guidance on when to implement the EJTG’s proposed analytical approach and information sources;
- develop clear guidance on the approach or method for cumulative impact analysis in the EJTG (page 20, lines 23-29).
- clarify when a qualitative versus a quantitative analysis is recommended or needed (page 20, lines 34-36).

The panel’s response to questions 9 and 10 (pages 28-34) is thorough and points out the need to focus on the importance of considering alternate methods/metrics to evaluate EJ concerns. In addition, the discussion on how a metric chosen could favor a policy to equalize pollution or risk levels across groups or to equalize gross or relative environmental improvement across the groups instead of equity in the distribution of changes in environmental quality will be very helpful in shaping the next version of EJTG.

The response and recommendation to charge question 11, related to the analysis of the distribution of costs is clear and concise – it is beyond the scope of EJTG. The panel’s report is well justified in arguing against the analysis stating that EJ is about disproportionate impacts to health or exposure and not about total well-being. In addition, utilizing a willingness-to-pay metric could lead to low benefit measures due to the lower capacity to pay in EJ communities. The panel also correctly notes that stating: a) need to undertake analysis be assessed on “case by case” basis; b) cost analyses are not always necessary; and c) a lack of methods to adequately conduct the analysis together leads one to conclude “unnecessary to perform an analysis.” This also raises the question of appropriateness and the utility of cost-benefit analysis.

Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the Panel’s report?

There are no technical errors in the report. However, some ambiguity is observed in articulating an alternate method for assessing cumulative impacts or making concrete suggestions or recommendations in the context of defining a baseline, EJ population or disproportionality. For example, the panel could have proposed the Cumulative Impacts definition used by CalEPA (<http://oehha.ca.gov/ej/pdf/CIRreport123110.pdf>) or another institution as a draft language and suggested a pathway to finalize the same.

The panel suggests that the determination of the disproportionality be left to the policy and decision-maker (page 14, lines 37-44), but does not explain in detail as to why this approach is better than making a specific recommendation or providing alternatives to make a decision. As suggested, the level at which disproportionality determination is made could be different at different times and can be subjected to political and economic considerations. In contrast, as the panel report comments, it could be defined and a threshold be set and modified in an open public process, thus avoiding undue pressure and influences by stakeholders on the decision-maker.

Is the Panel's draft report clear and logical?

The report is clear in answering the charge questions. Because some issues are interrelated there is some level of redundancy that cannot be avoided. Some long paragraphs from the original document are quoted and discussed to provide the context and help the reader to better understand the panel's critic and opinions. The detailed and logical nature of the review leads to suggested changes and recommendations - a few as suggested earlier can be more specific and straight forward.

In the panel's report, on page 2 lines 8-9 states that analysts should be provided with guidance on how to account for uncertainties due to limitations of available data and gaps in knowledge. However, it would also be helpful to understand to what extent limitations are acceptable.

The panel's report suggests ambiguity in what type of assessment is needed for an EJ analysis. The report states that the Risk Assessment Model may not be suitable for assessing EJ concerns, but instead of proposing alternatives, the report gives the option to use the current risk assessment model paradigm. At the same time, on page 3 the report says the "lack of guidance on cumulative risk assessment, dose-response assessment for chemicals in a mixture and exposure assessment are the primary technical challenges for the EJTG...More technical guidance is needed on how to incorporate and evaluate cumulative impacts for chemical and non-chemical stressors, quantitatively and or qualitatively." Clearly the analysis struggles with the relative merits of incorporating risk assessment into EJTG or proposing an alternate approach such as screening or health impact assessment. This struggle leaves the reader unclear on the proposed approach. This ambiguity is reflected in the terminology of the EJTG and the panel report. The report refers to cumulative risk assessment and impact assessment seemingly interchangeably, while they are not. Cumulative risk assessment quantifies the probability of an adverse effect based on various exposure and toxicological inputs. Cumulative impact assessment is a semi-quantitative approach that can be useful in ranking, screening, or identifying important factors for further consideration. I think the frustration in many communities has been that cumulative risk assessment requires too high a bar for data inclusion and as a result many factors are left out. While cumulative risk assessment may be useful for considering a family of related toxic chemicals with extensive data, it is hard pressed to be

helpful in evaluating a combination of chemical and non-chemical stressors reflecting a range of data quality and quantity. The panel needs to grapple with this issue and make specific recommendations or suggest alternative approaches for consideration.

Are the conclusions drawn or recommendations provided supported by the body of the Panel's report?

The report's recommendations focus extensively on improvements in the EJTG. The recommendations are sound and well documented.

Comments from Dr. Joseph Arvai

1. *Were the charge questions adequately addressed?*

The SAB review of the *Draft Technical Guidance for Assessing Environmental Justice in Regulatory Analysis* seems very thorough and careful.

In my own review of the *Draft Technical Guidance*, as well as the SAB's review of it, I made the following observations:

- a) Regarding **CHARGE QUESTION 1**, I agree with the SAB review that more detailed examples of how to conduct an EJ analysis for regulatory action would be useful. I also agree that the manner in which qualitative and quantitative data are treated may cause confusion for analysts.
 - However, the response to this charge question is full of generic critiques that, in my view, may not be helpful to the EPA. For example, the SAB review seems to take issue with risk-based approaches, but offers little in the way of suggested alternatives (see 2c, below); see the bottom of page 9 (as well as in response to **CHARGE QUESTION 9**) for a natural place for a broadened discussion of alternative approaches.
 - The SAB review also raises, quite rightly, additional complications and considerations regarding multiple stressors and cumulative effects; see page 10. However, the SAB review offers little in terms of guidance (or even places to look for suggestions) that may be helpful to the agency. This is a shortcoming in my opinion.
 - The SAB review makes an excellent point about data quality (versus, for example, relying on the newest data sets). However, the key – I think – is *decision-relevant* data; that is, data that characterizes EJ concerns, and helps decision makers to make comparisons between regulatory options (or between current and baseline conditions). I'd like to see the SAB review do a better job of addressing the need for decision-relevant data as a measure of data quality.
- b) Generally speaking, **CHARGE QUESTION 2** is clearly addressed by the SAB review. However, **CHARGE QUESTION 2a** (regarding the appropriateness of the directions regarding the use of qualitative and quantitative data) seems to have not been answered directly. (In fairness to the SAB review, however, it does take issue with a vague and perhaps misunderstood treatment of qualitative and quantitative data.)
- c) **CHARGE QUESTION 3** is clearly addressed by the SAB review. However, as a side note, I found the treatment of "baseline" comparisons in the *Draft Technical Guidance* to be somewhat confusing.
- d) The SAB response to **CHARGE QUESTION 4** leaves too much to the imagination, in my opinion, about how the EPA may account for the validity and reliability of qualitative data. The SAB response to this charge question also raises, again, the distinction between high-quality data and the *newest* data. Both of these points are important; but they cover ground that was already addressed in **CHARGE QUESTION 1**. And, these points say little about the importance of decision-relevant data (see 1a, above). I'd prefer to see the response to this charge question sharpened, and the repetition reduced.
- e) **CHARGE QUESTION 5** is clearly addressed by the SAB review.

- f) **CHARGE QUESTION 6** is clearly addressed by the SAB review. However, once again, the SAB review draws attention to qualitative and quantitative data, and ignores the importance of decision-relevant data. Also, the suggestions miss an opportunity to address the manner in which qualitative data can be operationalized using proxy and constructed scales (see 2b, below).
- g) **CHARGE QUESTION 7** is clearly addressed by the SAB review. However, though the SAB review seems to provide only lukewarm support for risk-based approaches, it fails to provide a meaningful discussion of alternatives. The only alternative put forward in the SAB review, the precautionary principle (see 2c, below), appears on page 22. For the SAB review to be most useful to the agency, I'd like to see more alternatives discussed. Moreover, I'd like to see these alternatives (including risk-based approaches) discussed in a more value-neutral fashion; e.g., the quote from Corburn (2002) on pp. 22-23 critiques risk characterization, but in a manner that is lacking in context for the reader. As a result, it's a rather vacuous critique.
- h) The SAB's response to **CHARGE QUESTION 8** should be bolstered in my opinion. For example:
- Page 24 includes the following passage: "*Some SAB panel members suggested that a framework based on the risk assessment model may be difficult for both its technical limitations as well as its reputation for being difficult to understand, and potentially unfair to impacted communities with multiple sources of* ~~stressors~~ *stressors*." ~~Stressors~~ quote to be more useful to the agency, more context should be provided; e.g., *what technical limitations?, what reputational concerns?, why is it difficult to understand?, why is it unfair?, etc.*
 - The SAB suggests that the EJTG should direct analysts to broaden risk assessment beyond health and economics. I agree, and I would like to see the SAB provide examples that illustrate how this might be achieved.
 - The SAB suggests that the EJTG should emphasize the importance of public involvement. But, without guidance as to why public involvement is important (to identify community concerns, objectives, and performance measure – all of which are precursors to collecting decision-relevant data), this recommendation seems like little more than a check-box for analysts to tick.
 - The discussion on page 25 about characterizing "hot spots" is cryptic. Likewise, the discussion of uncertainty factors is unclear.
 - Figure 1 lacks context and is, therefore, not as clear as it should be.
- i) I've noted elsewhere that I'd like to see the SAB's review contain more information about different methodological approaches that the agency may use to address EJ issues. A more detailed accounting – with detailed references; see 2f, below – should appear in the response to **CHARGE QUESTION 9**. As it stands, the SAB's response to this charge question seems to lack the detail requested by the agency.
- j) **CHARGE QUESTION 10** is clearly addressed by the SAB review.
- k) **CHARGE QUESTION 11** is as clearly addressed by the SAB review as it can be given that the section on costs in the *Draft Technical Guidance* was rather weak. A better treatment of assessing economic costs in the *Draft Technical Guidance* would likely lead to more useful guidance from the SAB review.
- l) I agree with the recommendations made in the SAB review in response to **CHARGE QUESTION 12**. However, this section could be strengthened if it were linked to a more

detailed answer to CHARGE QUESTION 11. For example, a more detailed accounting of alternative methods for addressing EJ concerns would lend itself to more direct recommendations for future EPA research; likewise, more information about methods would better support recommendations regarding EPA staffing. (On this latter point, the SAB review may benefit from a review of the recent SAB/BOSC review of ORD's strategic research plans, which similarly made suggestions about staffing needs in the social/behavioral sciences at EPA.)

2. *Are there are any technical errors or omissions in the report or issues that are not adequately dealt with in the draft report?*

- a) The Executive Summary should, in my view, be organized by charge question. The Executive Summary, as written does not do a satisfactory job of summarizing the SAB report.
- b) The SAB review of the *Draft Technical Guidance* takes issue with the lack of a clear definition of "qualitative data", as well as a weak characterization of how it may be used in agency decision-making. However, in my view, the SAB review also is weakened by a lack of clarity regarding the role that qualitative inputs to decision-making. There are many ways that qualitative data may be used in decision-making (or, by decision-makers). For example, one can look at first-person or community narratives as sources of 'pure' qualitative data. On the other hand, one can delve more deeply into narrative characterizations of risks (and benefits), and then use this information to develop quantitative data sets (using proxy or constructed attributes and performance measures) that can be used during decision-making (see an excellent review by Keeney and Gregory 2005¹).
- c) As an alternative to a risk-based approach for addressing EJ concerns, the SAB review puts forth the precautionary principle. This approach is not without its own detractors; indeed, I believe it would have significant shortcomings in terms of providing guidance to the EPA and communities regarding the range of acceptable (and unacceptable) tradeoffs that must be addressed concerning risks and benefits. If the SAB review is to include reference to the precautionary principle, I'd like to see other approaches also addressed.
- d) Building on point 2c, can the SAB review not include a table outlining alternative approaches for addressing EJ concerns? Surely, the SAB panel can make suggestions that go beyond "traditional" risk assessments and the precautionary principle.
- e) I find the SAB review to be unnecessarily repetitive in places. For example, critiques of EPA's handling of qualitative vs. quantitative data, data quality, public involvement, etc. comes up in various places in the SAB report. I understand that some of this repetition is unavoidable. However, I'd like to see the SAB try to reduce some of this repetition by drawing connections between various sections in the report. Doing so would make for a more readable and useful report in my opinion.
- f) I count 54 references in the SAB review. Of these, only 16 are peer-reviewed articles accounting for EJ issues and methods specifically. For the review to be more useful to the agency, I think more references should speak directly to EJ considerations (vs.

¹ Keeney, R., and R. Gregory. 2005. Selecting attributes to measure the achievement of objectives. *Operations Research* 53:1-11.

toxicological reports, for example). These additional references should be linked to a bolstered section on methodological approaches; see 1i, above.

- g) The *Draft Technical Guidance for Assessing Environmental Justice in Regulatory Analysis* could be clearer when it comes to the purpose of accounting for EJ considerations in agency decision-making. For example, addressing the impact of agency decisions will likely require assessing impacts on two levels: (1) a comparison of vulnerable communities with baseline communities (to make the case for an EJ-specific analysis), and (2) a comparison of the anticipated condition of the vulnerable community following the implementation an EPA rule or decisions with the conditions in the community that would be realized absent the EPA rule or decision. Such comparisons require multiattribute analyses, as well as an explicit accounting of tradeoffs between risks and benefits. Contemporary work in the decision sciences addresses these kinds of comparisons; I was surprised that this body of research and practice was not addressed in the *Draft Technical Guidance* or the SAB review of it.
- h) Page numbers starting on page 40 are missing.

3. Is the draft report clear and logical?

For the most part, yes. However, as I note above, I found the report to contain too much repetition. Removing some of this repetition would lead to a shorter, more readable, and ultimately more useful review.

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

Yes.

Comments from Dr. Kristina Mena

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

Yes

2. Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

The use of "best practices" and guiding principles in a document like the EJTG would enhance its effectiveness for a range of users with different experiences and objectives. Perhaps this feedback could be more strongly emphasized, or placed at the forefront of the feedback. A document that includes "best practices" may be more practical and user-friendly. As the Committee's report states, case studies that provide specific examples could also be included (perhaps in an appendix).

The EJTG would benefit from a discussion on community-based participatory research (CBPR). This would foster public participation as mentioned on page 6, line 12 in the Executive Summary.

When considering a "user-friendly" document, the inclusion of risk assessment makes this more challenging. It is stated in the EJTG that the intended audience includes analysts and those involved in rule-making (including those who conduct risk assessments). In these instances, Section 4: Considering Environmental Justice when Planning a Human Health Risk Assessment can be useful. However, if it is anticipated that a wider audience would benefit from an informative document on environmental justice, then it could be expected that some would not benefit from this section and may even misinterpret some of the information. While discussing the importance of environmental justice considerations in risk assessments is critical, it may be more effective if the interrelationship of environmental justice and risk assessment as presented in Section 4 of the EJTG is included in a risk assessment guidance document (with environmental justice issues included) rather than an environmental justice document with a risk assessment methods section included. Including conceptual maps or frameworks may enhance this section.

The Committee's report does provide the feedback that an environmental justice analysis needs to be transparent; however, it may be beneficial to emphasize the importance of transparency throughout each step of the analysis, including risk assessment since that is included in the EJTG.

3. Is the Committee's report clear and logical?

The comments in the report are clear and reasonable. The key points and recommendations are consistent when comparing the Letter to the Administrator, the Executive Summary, and the body of the report.

One area that appears to be lacking in the Executive Summary, however, are the specific suggestions regarding staff support hires. Also, on page 6 of the Executive Summary, the comment: “The distinction between differential impacts and disproportionate impacts” should be reworded or clarified.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee’s report?

The report suggests the hiring of those experienced with community-based participatory research (CBPR), but the incorporation of CBPR in the guidance document is not emphasized in the Committee’s feedback.

Comments from Dr. Peter Wilcoxon.

1. Were the charge questions to the committee adequately addressed?

In general, the SAB committee did an admirably thorough job of addressing the charge questions. The only exception is the response to Charge Question 2, which could be clarified.

Question 2a asks about striking a balance between analytical costs and benefits when carrying out an EJ analysis. To paraphrase, it asks: (1) whether it is reasonable to expect analysts to carry out a quantitative EJ analysis using (principally or exclusively) quantitative data already produced in the course of evaluating a rule; and (2) whether analysts should be expected to produce a qualitative analysis in the absence of quantitative data. Question 2b asks for advice on methods and best practices for evaluations of a national rule.

The first two paragraphs of the response (page 13, lines 12-32) discuss the difficulty of training inexperienced analysts to carry out an EJ and suggest the EJTG will not provide enough background on its own. Both paragraphs seem to be out of place: neither addresses questions 2a or 2b directly. They would be more appropriate as part of the response to question 1, which addresses the overall strength of the EJTG as a guide for analysts.

The third paragraph (page 13, lines 34-41) does address the charge questions but it is too terse. It seems to be addressing question 2a by saying, in effect, “No, analysts should not be instructed to use readily available quantitative data by default, and to use qualitative data as a fallback.” It then seems to address 2b by saying—again in effect—“An analysis should use the best data possible, whether quantitative or qualitative. An analyst should assess the quality of all data available and if better qualitative data is available for an EJ analysis, it should be preferred to lower-quality quantitative data.” The response doesn’t explicitly address the implicit question in 2b regarding whether different standards are needed for evaluating national rules rather than other applications of EJ analysis. Presumably the committee’s view is that the same standard should apply to all analyses.

Overall, the response to question 2 would be clear if the first two paragraphs were moved elsewhere and the third paragraph was rewritten to make the link to the questions more explicit.

2. Are there any technical errors or omissions or issues that are not adequately dealt with in the draft report?

No, the SAB committee’s report seems thorough and comprehensive.

3. Is the draft report clear and logical?

Yes, it is generally very clear overall. With that said, the following minor substantive clarifications would be worthwhile:

- Page 3, lines 41-42 includes the sentence: “Additional uncertainty factors may not be appropriate as they may become the focus of the assessment and lead to inaction.” This

incorrectly suggests that the analysis should be guided by a desired outcome. It should be revised to read “However, simply adding more uncertainty factors may not clarify the analysis.”

- Page 5, line 44-Page 6 line 3 on public involvement reads as follows:

Although the EJTG describes public involvement as an essential element of achieving environmental justice, there is no prescriptive mechanism specified for ensuring that the public is involved in an environmental justice analysis. Instead, words like “*if feasible*” or “*if possible*” are used to guide the analyst on considering public involvement; such phrases may suggest to impacted communities that the EPA lacks a commitment for incorporating public involvement and EJ concerns into the risk assessment process.

This could be interpreted as suggesting that the problem is about appearances, which seems at odds with the committee’s intent. It would be clearer as follows:

Although the EJTG describes public involvement as an essential element of achieving environmental justice, there is no prescriptive mechanism specified for ensuring that the public is involved in an environmental justice analysis apart from brief references to the Agency’s general guidelines on public involvement. Moreover, the EJTG sends mixed messages in places where words like “*if feasible*” or “*if possible*” are used to guide analysts considering public involvement. As a result, analysts may incorrectly believe that public involvement is optional.”

- Question 2: Clarifying the response as discussed above.
- Page 15, lines 1-2: The point of the following sentence is unclear: “Finally, the first question requires reconsideration in light of the outcomes or final decision.” If it is intended to refer to the third question (as does the rest of the paragraph) rather than the first question, it would be clearer as “It requires reconsideration in light of the outcomes or final decision.”
- Question 5: On page 18, lines 26-27, the response says “It was also suggested that Recommendation 6 be omitted entirely, or the role of costs be amplified throughout the guidance.” Unlike the rest of the report, this stops short of giving the Agency clear advice. It would be better to replace this sentence with a cross reference to the answer to Charge Question 11 (where the subject is taken up in more detail) as follows: “For further discussion regarding the distribution of costs, please refer to the response to Charge Question 11.”

In addition, the following editorial revisions, listed by page (P) and line (L), would improve the clarity of the report:

- P4, L11: Change “as well as,” to “as well as to”.
- P5, L8-13: For clarity, change the following sentence:

The SAB recommends that working model with clear guidance (including what variables to control for when selecting comparison populations; how to incorporate quantitative and qualitative differences when selecting comparison populations; demographic versus geographical considerations; national versus state versus local data; and the level of refinement needed) should be included in the EJTG until there are better methods developed in the future.

To read:

The SAB recommends that a working model with clear guidance be included in the EJTG until better methods are developed in the future. The model should address the following issues: what variables to control for when selecting comparison populations; how to incorporate quantitative and qualitative differences when selecting comparison populations; demographic versus geographical considerations; national versus state versus local data; and the level of refinement needed.

P5, L26: Change “guide” to “recommend”.

P5, L38: Remove comma after “from the rule”.

P6, L21: Change “The distinction” to “Clarify the distinction”.

P9, L11-12: Change “Data used in risk analyses may include” to “Risk analysis can make use of”.

P9, L16-17: Change “The bottom line...of the data.” to “The bottom line for inclusion of data of any type should be that the analyst is confident that it is of high quality.”

P10, L31: Change “explain if” to “explain whether”.

P10, L31-32: Change “health protective” to “protective of health”.

P10, L37: Change “should be included for any inclusion” to “should be given for any inclusion”.

P19, L33: Change “In addition, the SAB” to “Instead, the SAB” and “... any examples” to “... examples”.

P25, L4: Change “inviolate” to “essential”.

P25, L8: Remove the comma after “community”.

P28, L34: Remove the comma after “mentioned”.

P31, L1-2: Change “to do which” to “to do. It”. Also, add a period after “rules” on line 2.

P31, L22: Change “overall confusing” to “overly confusing”.

P32, footnote 6: Add a space after the footnote mark, change “Tribes will” to “Tribe leaders will” and change “that their birth” to “that birth”.

P33, L1: Change “the proximity rule” to “the distance used in a proximity rule”.

P33, L7: Change “group. Bowen” to “group: Bowen”.

P33, L13: Change “approach and should be cited” to “approach. That literature should be cited”

P34, footnote 7: Add “located” after “...when receptors (people) are”.

P35, L15: Change “conscripted” to “circumscribed”.

P35, L26: Delete “in providing guidance on costs”.

P36, L36: Change “because the distributional” to “because distributional”.

P36, L39: Change “rapidly) over time, lower income people will possibly buy new cars, or experience a cost, in the long-run, as” with “rapidly). Over time, the burden will also fall on lower income people as they buy new cars, or as”.

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

Yes, the SAB committee has provided strong support for its recommendations.

Comments from other SAB Members

Comments from Dr. Costel Denson

General Comments

The charge is complex. It consists of twelve (12) questions that span a wide range of important issues related to Environmental Justice. The committee is to be commended for developing balanced responses to the complex issues raised in the charge. The report itself, though, could be stronger and more authoritative in the presentation of its recommendations. For example, in the cover letter (page 1, line 44), the sentence, which begins with “The SAB would like to offer”, could deliver a stronger message if it were the opening sentence of the next paragraph. In general, this reviewer found the organization of the responses to the charge questions to be somewhat confusing. Perhaps some reorganization would be appropriate.

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

Yes

2. Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee’s report?

Not in this reviewer’s view.

3. Is the Committee’s report clear and logical?

The report would be a little easier to follow if there were some reorganization around the findings and recommendations.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee’s report?

Yes

Comments from Dr. David Dzombak

I commend the panel on a thorough evaluation that is responsive to the charge, and for a well written and well organized report.

1. Were the original charge questions adequately addressed?

Yes, the original charge questions are addressed adequately.

2. Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the Panel's report?

I found no technical errors or omissions.

3. Is the Panel's draft report clear and logical?

The draft report is well written and well organized. It responds to the charge questions systematically and with specificity.

(a) The Letter to the Administrator is well written and summarizes a number of key findings and recommendations in the report. It is fairly concise at less than three full pages in length. Its readability would be improved by addition of some section headings.

(b) The Executive Summary could be improved by making clear what the charge questions were, and in which section they were addressed. This is done in the body of the report, but does not come across in the Executive Summary. One should be able to read the Executive Summary alone and understand what the charge questions were and how they were addressed.

4. Are the conclusions drawn or recommendations provided supported by the body of the Panel's report?

The findings and recommendations presented in the Letter and in the Executive Summary are adequately supported in the body of the report.

Comments from Dr. Robert Johnston

1) Were the charge questions to the committee adequately addressed?

The SAB review is detailed and comprehensive, and does a good job of responding to the charge questions. The EJTG report covers a wide range of diverse scientific topics and the charge questions are relatively extensive and open-ended, making this a difficult review to conduct. Nonetheless, the SAB review does a good job of addressing these topics and charge questions. I have some concerns with the technical clarity and consistency of a few sections (e.g., addressing qualitative versus quantitative data and cost analyses); these concerns are addressed below.

2) Are there any technical errors or omissions or issues that are not adequately dealt with in the draft report?

There are two issues for which the SAB review requests additional clarity in the EJTG report and suggests specific improvements, but the SAB guidance appears to be unclear or technically inaccurate. These two issues relate to: (a) the use of quantitative versus qualitative data, and (b) analysis of the distribution of costs.

Quantitative versus Qualitative Data: Many locations throughout the SAB review call for additional clarity on the use of quantitative versus qualitative data, including the role of, and weight given to qualitative data. The review comes across as strongly supporting the use of qualitative data; this is not necessarily a flaw, but is noticeable. I agree with the SAB that additional clarity is required in the EJTG regarding the use, relevance and role of quantitative versus qualitative data. However, in seeking to provide guidance in this area, the SAB review makes claims that are either unclear or technically inaccurate, or that overlook practical considerations in the use of qualitative versus quantitative data.

First, the SAB review correctly highlights that the “highest quality and most relevant data” should be used. It also correctly notes that qualitative data is not akin to anecdotal data, that there are accepted means to evaluate the quality of both quantitative and qualitative data, and there are many types of rigorous analyses which can be conducted using qualitative data alone. I agree that the EJTG should place greater emphasis on the identification and use of high quality qualitative data. However, it is also true that quantitative data—rightly or wrongly—is often given greater weight in policy deliberations. This issue is frequently encountered in economic cost benefit analysis (CBA) or natural resource damage assessment (NRDA), in which the lack of ability to quantify a value leads (effectively) to that value being disregarded or treated as zero in the final analysis. Kling et al. (2012), for example, provides a discussion of this issue in the context of controversial methods for quantifying environmental values. While this does not imply that quantitative data are superior to qualitative data, it does imply these types of data can have a different role and practical impact on decision-making. The SAB review would be strengthened by a clearer recognition that quantitative and qualitative data are not perfect substitutes, and do not serve perfectly equivalent roles in the policy process. Moreover, in some cases quantitative data are preferred for practical reasons.

The SAB review also includes some potentially inaccurate or misleading statements regarding the differences between quantitative and qualitative data. For example, page 13 states that “In some situations, high quality nominal and ordinal data are more certain and available, and hence, more reliable than a less rigorous quantitative database.” This (incorrectly) implies that ordinal data are not quantitative data. Ordinal data are generally considered to be a type of quantitative data (e.g., they can be represented numerically and are suitable for statistical analysis). Even nominal data can sometimes be quantitative, e.g., if they are given in terms of counts (as they sometimes are in marketing applications). The last sentence of the same paragraph appears to equate quantitative data with interval data. This is also inaccurate. Interval data are only one type of quantitative data; others include ratio data and ordinal data. In summary, while I applaud the SAB review’s call for greater clarity in the definition and roles of quantitative versus quantitative data, the review should be edited for precision and accuracy in its own definitions.

Analysis of Costs and their Distribution: In general, the SAB review’s discussion of costs and their distribution (e.g., pages 18 and 35) could be more clear and consistent. The SAB review states that the EJTG should “either (a) guide against inclusion of costs in the scope of EJ analyses, or (b) provide much more guidance on the key issues for addressing costs.” I disagree that the EJTG should guide “against inclusion of costs in the scope of EJ analyses,” as this would lead to the omission of information relevant to EPA decisions, and is based on a relatively narrow definition of EJ. On a related note, the SAB review should clarify whether the first sentence in that paragraph (i.e. “EJ is about disproportionate impacts to health ... and not about total well-being.”) reflects an accepted EPA definition or the opinion of the SAB review committee.

I agree with the SAB review that the EJTG should expand the treatment of costs. EPA already provides standardized guidance for the analysis of benefits and costs. To the extent that relevant guidance is already provided in extant documents, the EJTG could merely refer to these documents. I was surprised that neither the EJTG nor the SAB review mentions the EPA Guidelines for Preparing Economic Analysis (EPA 240-R-10-001, updated in 2014), which directly addresses many of the concerns and points discussed in the SAB review, for example related to the use of general versus partial equilibrium analysis.

The SAB review also includes a number of statements regarding the analysis of cost distributions which are potentially unclear or misleading. For example, lines 23-25 on page 35 seem to confuse the issue of benefits versus costs, discussing willingness to pay (a benefit measure) in the context of a discussion on cost analysis. It is true that the *loss* of a benefit (measured, e.g., via willingness to pay) may be interpreted as a cost. Hence, this sentence is not entirely incongruous. Nonetheless, the SAB review would be strengthened by a more clear and systematic treatment of these concepts.

Page 37 of the SAB review states that “In general, an accurate accounting of the distributional cost impacts of a policy will require a general equilibrium analysis.” This is not necessarily accurate, at least in the general/universal sense in which it is stated. The need for a general equilibrium model to accurately assess distributional cost impacts depends on the type of policy impacts being considered, and the magnitude of broader market effects. Many CBAs address changes for which secondary effects are likely to be small, and in which partial equilibrium

analysis is an acceptable means of analysis. In other cases, suitable general equilibrium models are not available. Moreover, general equilibrium analyses are generally unable to capture non-market costs, which can be a significant component of total costs. Given this, I think that this sentence should either be removed or clarified. Regarding the following paragraph in the SAB review, I agree that the EJTG should provide guidance regarding when a partial versus general equilibrium analysis is required. However, some of this could refer to EPA's Guidelines for Preparing Economic Analysis (citation above), which already addresses this issue. This would enable the EJTG to maintain some conciseness, while focusing on issues that are specific to EJ evaluations (many of these are already mentioned in the SAB review).

3) Is the draft report clear and logical?

Aside from the issues raised in 2 above, the draft report is largely clear and logical. The SAB review is relatively long, but this length appears to be warranted by the extensive detail of the underlying EPA report. There is also some redundancy in the SAB review, although this appears to be warranted given overlaps in the charge questions.

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

Yes. With the exception of the few issues raised above, the conclusions and recommendations appear to be supported by the body of the report.

References

Kling, C.L., D.J. Phaneuf, and J. Zhao. 2012. "From Exxon to BP: Has Some Number Become Better Than No Number?" *The Journal of Economic Perspectives* 26: 3–26.

U.S. EPA (Environmental Protection Agency). 2010. "Guidelines for Preparing Economic Analyses." EPA 240-R-10-001. Washington, D.C.: U.S. EPA Office of the Administrator.

U.S. EPA (Environmental Protection Agency). 2014. "Guidelines for Preparing Economic Analyses." Washington, D.C.: National Center for Environmental Economics, Office of Policy, U.S. Environmental Protection Agency.

Comments from Dr. Francine Laden

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

The Committee very thoroughly addressed the charge questions. They provided extensive detail and many constructive criticisms. The ones pertaining to definitions and clarity of meaning in the report are quite key.

2. Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

I am not aware of any technical errors or omissions

3. Is the Committee's report clear and logical?

The committee report is quite extensive and detailed as it steps its way through the 12 multipart charge questions. Many detailed important concepts are presented for each one. This report would greatly benefit from a bullet list of recommendations at the end of each Charge questions section. In this way the main concepts of the recommendations can be easily discerned.

There are a number of places where the Committee alludes to literature that was missed by the original authors. (e.g. p 14, line 32). It would likely be most helpful if at least some of these references could be provided

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

A clear summary of the report is needed. Although, the suggested bullet list will come a long way to addressing this concern, an all encompassing conclusion paragraph or section is needed.

Comments from Dr. Surabi Menon

1) Were the charge questions to the committee adequately addressed?

The review has addressed the charge questions adequately.

2) Are there any technical errors or omissions or issues that are not adequately dealt with in the draft report?

The report appears to do a thorough assessment of the report. Since my expertise on most aspects of the report is limited, I was not able to identify any omissions or errors.

3) Is the draft report clear and logical?

The report is presented in a clear and logical manner. It appears very technical in its recommendations for improvements and perhaps could offer a summary of key recommendations more concisely after each section to help the reader note the various areas for improvement.

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

The recommendations seem to be well supported in the draft report.

Comments from Dr. Eileen Murphy

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

The charge questions were adequately addressed. The executive summary is particularly concise and well written. The SAB panel was asked to comment on: the clarity and technical accuracy of the guidance; the inclusion of the most relevant peer reviewed literature; appropriateness and sufficiency of the six analytic recommendations listed in the EJTG to ensure consistency, rigor and quality across assessments; the clarity and accuracy of the guidance on when and how to conduct an analysis of the distribution of costs; and key methodological or data gaps specific to considering EJ in regulatory analysis. The report clearly addresses each of these areas with direct and significant recommendations.

2. Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

There were no technical errors or omissions that this reviewer found.

3. Is the Committee's report clear and logical?

This is a well-written and logically-organized report.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

Yes, the conclusions in the report are validated by the narrative. I am especially supportive of the panel's recommendation to EPA to change language such as "if feasible" and "when possible" to more definitive active recommendations.

Comments from Dr. James Opaluch

1. Were the charge questions adequately addressed?

Yes

2. Are there are any technical errors or omissions in the report or issues that are not adequately dealt with in the draft report?

Not that I am aware.

3. Is the draft report clear and logical?

I most strongly agree with the recommendation that the "... EJTG needs to include better definitions for the terms that are used (e.g., disproportionality, cumulative risk, co-factors, susceptibility, vulnerability, EJ populations and communities)." The specific definitions for these terms could easily determine whether a particular regulatory action does or does not comply with standards for environmental justice.

Page 1, lines 34-35. I believe the report should clarify the conclusion "By limiting its scope and not repeating existing guidance, the EJTG can reduce redundancy and the risk of providing conflicting instructions." I believe the intent of this sentence is the EJTG focus only on environmental justice issues, and not on other issues, such as risk assessment (page lines 20-24). The report should clarify this question.

Bottom of page 9, through page 10. I'm concerned about the logic underlying this discussion about EJ and risk assessment. Do the authors really mean to say that risk assessment as currently practiced is incomplete, and should be augmented with considerations of environmental justice. Risk assessment should still be an essential part of the process.

Similarly, page 10 lines 18-19 say "The lack of guidance on cumulative risk assessment, dose-response assessment, and exposure assessment are the primary technical challenges for the EJTG." Cumulative impacts are technical changes to risk assessment, not specific to environmental justice. Although EJ requires that risk assessment be placed into a larger context of a suite of environmental challenges.

Top of page 11. "The differential exposure of families living in multi-unit properties owned by non-compliant landlords could potentially increase, relative to renters in a higher socioeconomic status." I would argue that if risk is reduced by ALL then it is desirable, even if the relative benefits to higher income individuals. Otherwise, one could use the same logic to conclude that that EJ could be used justify a regulatory action that makes everyone worse off—but has a more negative effect on high income individuals than on low income individuals. Absolute improvements

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

Yes

Comments from Dr. Amanda Rodewald

The panel did a great job addressing the charge questions and the responses were clear, logical, and as far as I could tell without errors. Below I share some thoughts;

1. Page 14. In steps 4 and 5, the text reads "across population groups". I wasn't clear if they meant separately for each group or pooled across groups. This could be clarified.
2. Page 20, bullet "e". I didn't understand the distinction being made between biological significance vs significant human health impact. Unless "biologically significant" excludes humans, then I would think that a significant human health impact was also biologically significant.
3. Page 23, line 14. Disproportionate AND differential?
- 4.. Page 23, line 23. "Their quality"
5. Page 24, lines 34-38. I'm concerned that some may view this as mission creep by suggesting a very broad range of stressors be considered. Perhaps the text could be clear that this broad range of stressors should be considered as they mediate those stressors under jurisdiction and regulatory authority of EPA.
6. Page 38. The topics listed seem so broad as to include everything and, consequently, of little use in focusing future research on the most needed problems or questions.

Comments from Dr. Gina Solomon

There are good concepts and suggestions in the SAB draft report on the EJTG, however I found the report overall to be difficult to read and less helpful than it could be. The responses to the charge questions are often buried in the text, or sometimes not even present except perhaps by inference. There were also strong statements in the report (echoed in the Executive Summary and the cover letter) that seem to be incorrect or inappropriate, based on my reading of the EJTG. For these reasons, I would recommend a fairly significant reworking of this draft report.

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

I have concerns about whether the reviewers fully addressed the charge questions. In particular, the report lumps together all of the questions and sub-questions under Charge question 2 and then fails to address each of the parts of the question in a systematic manner. The text on p. 13 of the report does not directly respond to the charge questions and instead talks generally about the length of the EJTG, and how to better train analysts, neither of which directly address the questions. The last paragraph emphasizes data quality, but again it doesn't address charge question 2(b). I would suggest that this section be rewritten and broken up into subsections to directly address each of these charge questions.

With Charge question 3, I had difficulty finding a clear response to the actual question, although an answer was sometimes suggested in the paragraphs that followed. This question is about whether the 5 key questions in the EJTG Section 1.1 are clear and appropriate for analysts. Rather than offering a clear answer, the draft report quotes extensively from the EPA EJTG and then digresses into broader issues, such as whether the EJTG overall adequately addresses public participation. It seems to be implied here that the Committee endorses Question 1 (which is about public participation), but that isn't actually stated. Similarly, the Committee raises broader concerns with disproportionality (discussed more in my comments below), but doesn't actually offer any concrete suggestions for reframing Question 2 in light of those concerns. If I were trying to revise the draft EJTG in light of these comments, I would find very little useful guidance in this report. The most helpful and direct comment in response to Charge question 3 is on p. 15, line 15 "From the risk analysis perspective, the five steps make sense." – although I found this sentence to be a lukewarm statement, it at least appears to perhaps be some kind of an endorsement of the five steps. However, the recommendations that follow that sentence (about labeling two steps as part of risk management) are unclear, since there's no obvious way to 'label' any of these steps. The final sentence is a broad exhortation to "focus on the data", which isn't at all helpful with regard to answering this charge question. I could go on with similar comments on the other charge questions, but suffice it to say that the pattern continues throughout this report, where the actual responses are very difficult to discern in the text, and sometimes aren't present at all, while there are general observations provided that may or may not be useful to EPA or relevant to the charge questions they follow.

2. Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

There are at least two areas where I think the report contains errors.

- 1) Disproportionality

The report recommends frequently and variously that the term 'disproportionality' be defined in the report, or that it be defined earlier in the report (Cover letter lines 2 and 18; Executive Summary p. 1

line 33, p. 2 lines 34-36, p. 6 line 21; Report p. 19 lines 4-10). However p. 18 of the report lines 37-38 contains one of the few clear statements in the report, and that statement directly conflicts with all the others, saying “The SAB agrees that there is a clear distinction between differential impacts and disproportionate impacts as EPA defines them.” This section goes on to say that the “text on this topic in the EJTG is overly complex and too detailed to be of practical use to an analyst.” All of these confusing and contradictory recommendations and statements completely baffled this reviewer. The contradictory statements on disproportionality forced me back to the EJTG where I found a very clear 1-page discussion of this issue on p. 10 of the EJTG (early in the document), with a definition in Text Box 2.2 (“The term disproportionate is used to refer to differences in impacts or risks that are substantial enough that they may merit Agency action.”). Therefore I recommend that the sections of the draft SAB report that address the issue of disproportionate impacts be rewritten to be mutually consistent, and to be factual based on the EJTG. I would understand if the SAB Committee disagrees with the EPA definition or if it wishes to suggest a way to clarify the definition a bit more, but it is simply incorrect to say that the term isn’t defined, or that it isn’t defined early enough in the report. In addition, I strongly disagree that the text in the EJTG is “overly complex” or “too detailed to be of practical value to the analyst”. In fact, the text in the EJTG is quite clear and concise.

2) Cumulative Impacts and Costs

I guess these issues may not exactly be errors, but they are places where I think the Committee may misunderstand the scope and purpose of the EJTG, and where there are inconsistencies between the report, the summary, and the cover letter, so I think these should be corrected. The Committee says “more guidance is needed on how to incorporate and evaluate cumulative impacts...” (Cover letter line 26) and “Furthermore, the EJTG should provide direction on how to characterize the uncertainty inherent in cost estimates.” (Cover letter lines 39-40). The cumulative risk issue is taken up again in the Executive Summary p. 3 lines 10-11, although interestingly the recommendations around costs are quite different in the Executive Summary than in the cover letter. In the body of the report, I had trouble finding recommendations that aligned with the statements in the cover letter. The discussion on cumulative impacts on p. 10-11 isn’t reflected in the Exec Summary or cover letter, although it appears that the statement on p. 10, lines 15-16 is what was picked up in the Exec Summary. My concern with these statements is that they appear to be asking EPA to go beyond the scope of the EJTG. In fact, with regard to cumulative risk assessment, the EJTG explicitly states “While not the focus of this technical guidance, Text Box 4.1 discusses a multiple stressor or cumulative risk assessment approach.” (p. 21). Similarly, the EJTG cannot cover all aspects of cost-benefit analysis. Both cumulative risk and cost-benefit analysis are huge topics and would not appropriately fall within the scope of this EJTG, so the apparent recommendation that EPA should provide “more guidance” and “direction” on these issues in the EJTG isn’t terribly helpful. If there are very specific things that would be manageable in scope that should be added, those would be appropriate to suggest, but the current recommendations are so broad and vague that they appear to be asking EPA to do something that would not be appropriate or feasible in the EJTG.

3. Is the Committee’s report clear and logical?

No. The report is unclear in numerous places, and it does not have a logical flow with direct responses to the charge questions.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee’s report?

Generally, yes, with the exception of the issues I pointed out in response to Question 2 above.

Comments from Dr. Daniel Stram

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

Each of the 12 charge questions are addressed. There is a general tendency for the review to ask for more concrete guidance than provided in the EJTG on a variety of subjects. Most of these are fully appropriate, but some may be not completely realistic. One basic question on this topic is how to incorporate existing multiple hazards into an analysis of the impact of a new regulation, and this is raised in the report. The problem is that it data on which to develop a multiple hazards analysis may not be adequate since joint analysis of multiple hazards is fundamentally more demanding than is single hazards assessment. The request for more clear guidance in things like analysis methods, selection of a control group, risk assessment, interpretation of epidemiological data, use of qualitative data etc. may be asking for a level of detail that is not really possible to give in general guidance. Cases studies are emphasized as important to add to the EJTG, I agree that case studies *when available* can be illuminating but even more so a range of case studies would probably make clear that prescribing a detailed approach to deal with all these questions is a very hard problem. General heuristics (as seems to be embodied in the EJTG based on what I am reading here) rather than generally applicable detailed advice may be all that is possible to provide.

2. Are there are any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

None are evident to me, although the technical difficulty of answering all the requests made in the review of the EJTG may be underappreciated.

3. Is the Committee's report clear and logical?

I found the response to charge question 6 to be difficult to understand. Apparently the reviewers agree that the distinction between differential impacts and disproportionate impacts, but not with the text describing them in the draft Guidance document. The 6 bullets (from the EJTG) are criticized as being too subjective and superficial, but only limited advice is provided (and not very clearly) about how they can be replaced or improved, or if they should be eliminated (i.e. I am confused by the request on page 19 lines 6-7 that "further detailed discussion and reference to disproportionate impact should be removed from the EJTG to avoid confusion". Many other of the responses seem to be rather discursive in nature. It might help to clearly list the recommendations in a concise way at the end of the discussion of each charge question.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

Sometimes it's just not that clear what exactly is being recommended, If the recommendations are concisely stated at the end of each commentary that might help.

Comments from Dr. John Vena

1) Were the charge questions to the committee adequately addressed?

YES

2) Are there any technical errors or omissions or issues that are not adequately dealt with in the draft report?

NONE

3) Is the draft report clear and logical?

YES

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

YES

Comments from Dr. Charles Werth

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

Generally, the charges to the SAB were adequately addressed in the report. However, I note one location where the charge was not directly addressed. On Page 24, section 3.7, Charge 8 asks if "Are the scoping questions outlined in Section 4.3.2.1 appropriate." Section 3.7.3 recommends prioritizing scoping questions, but it is not clear if the SAB thinks the scoping questions are appropriate.

2. Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

Page 12, section 3.1.9: At some hazardous waste sites there is a clear and measurable EJ concern, but cleanup does not occur (and is not pending). This might be due to financial constraints, or perhaps to inadequate communication post EJ identification that causes the sight to drop off the radar. Is EPA communication with the public after an EJ concern is identified specified in the EJTG to ensure that appropriate remedial measures will occur in the future.

3. Is the Committee's report clear and logical?

In response to charge 1 in section 3.1.1, the SAB "recommends that the document leverage the information in existing guidance documents on risk assessment..." There are perhaps many such documents. Are there specific documents that were considered especially important that could be identified?

On page 9 in section 3.1.4, it states that "some SAB panel members suggest that EPA's current approach to risk assessment may be incompatible with assessments for environmental justice." Why the current risk assessment approach may be incompatible with assessment for environmental justice appears unsupported in the text. If this is stated in another paragraph, reference to this could be inserted here. Also, the recommendation that follows to consider "alternative approaches" might need clarification. Are there specific "approaches" that should be considered that could be briefly described in this paragraph, or can another section of the report be referenced?

Page 19, section 3.5.2: Just after the six bullets, there is text that notes "these six bullets (shown above) are superficial and mostly subjective, and thus...." I agree that they are superficial, and excellent suggestions for making them more clear are given in the text that follows. However, it is not clear why they are subjective. Perhaps they can be implemented in a subjective manner because they are too vague, but in and of themselves they don't appear subjective.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

Yes, the conclusions and recommendations are supported.

5. Board members should also comment on the alignment and consistency of the message given in the Letter to the Administrator, the Executive Summary, and body of the report.

These documents appear in alignment and consistent.

