

Preliminary Comments on the REA Planning Document from Dr. Donna Kenski

Comments on REA for NOX, SOX, and PM
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Charge: Comment on Overall Analytical Approach

The REA document is clear and easy to follow. The decisions to include assessments for selected ecological effects are made with adequate justification in a straightforward manner. A lot of very recent information (citations from 2017 and 2018) has been incorporated in this draft, which is especially important given the large changes in S, N and PM deposition in recent years.

Chapters 2 and 3 are clearly written. The sections on Key Uncertainties/Limitations (2.4.1.2, 2.4.2.2, 2.4.3.2, 2.4.4.2, 2.4.5.2) are very well done. This REA has the most rigorous and consistent treatment of uncertainty I've seen in a NAAQS review; I like the level of detail (not overwhelming) and the inclusion of uncertainty as part of each section.

Charge: Comment on Ambient Air Quality Analyses

The proposed air quality analyses are reasonably comprehensive and, because they are mostly similar to those in previous EPA NAAQS reviews, well documented and described. However, a few aspects left me puzzled. In order to adjust air quality to just meet the standard(s) in a study area (most of which are national parks or Class 1 areas that have relatively low concentrations of the criteria pollutants), it seems inevitable that the upwind air quality must then exceed the standards. The REA mentions that this must be considered (p. 4-7, lines 9-11) but there is no hint as to how it will be resolved. Will an imaginary source be added to the study area to generate the required emissions? The previous reviews of the primary SO₂, NO₂, and PM NAAQS have adjusted concentrations using statistical models, but those focus on adjusting concentrations where observed concentrations are already high, and can be accomplished with physically reasonable assumptions. This REA is proposing something quite different, in that you will be adjusting concentrations where they are most likely low compared to surrounding areas. I can't imagine a realistic scenario that raises the study area concentrations to just meet the standard that doesn't also force concentrations surrounding the area to unreasonable levels. Some additional clarification is warranted.

Similarly, the explanation of the controlling standard was a little fuzzy and I had trouble imagining how it would actually be identified, given the varying spatial scales of the relevant criteria pollutants. Perhaps an example would help.

Another potential issue is spatial and temporal variability in model performance; the CMAQ normalized mean bias statistics cited (p. 4-5) look pretty good, but these could be quite different when one drills down to the study areas. I note that model performance in the study area is one of the aspects of data

availability and adequacy proposed as study area selection criteria (p. 4-22), so it looks like you already have this covered.

The methodology for developing deposition predictors (pp. 4-9, 4-10) was laid out well. I was surprised, though, that Table 4-2 says NH_x will not be included because it is not part of this review. The ISA has devoted considerable resources to showing that NH_x is frequently a significant part of total N deposition so it is not clear why, at this point in the process, it is off the table. Don't we need response factors for both oxidized and reduced nitrogen? Even if we don't have a regulatory mechanism for controlling NH_x, understanding the sensitivity of the study areas to changes in NH_x seems like an important piece of the puzzle to understand. Please explain further.

Comment on the Ecological Risk Assessment

I have no additional comments on this part of the document.

Minor comments, typos, etc.:

Chapter 1: Figure 1-2 could use a bit more elaboration and/or a more descriptive title. Although the text says it describes the conceptual model, it really only shows exposure pathways, which don't constitute a conceptual model by themselves.

p. 1-3, line 8: delete comma after methodologies

p. 1-8, line 11: delete comma after Figure 1-2

p.2-4, line 27: was -> were

p. 2-7, line 3: were -> was

p. 2-12, line 31: I think the 50% and 75% should be reversed; the lower Bc/Al should have a more negative impact on tree response.

p.3-3, lines 1-4: All through the ISA we've been using NO_y to describe the sum of NO, NO₂, and the various oxidation products. Why is NO_z used here? Let's stick with NO_y.

p. 3-3., line 24: delete 'likely'. These declines in emissions are certainly the result of national control programs.

p. 3-4, line 6-7: Fix this sentence fragment. It looks like it should read "...in the presence of NH₃, it forms particulate nitrate, which deposits via dry deposition *more slowly* than both HNO₃ and NH₃.

p. 3-4, line 20: Networks -> Network

Figures 3-2 through 3-7: the scale is illegible on all these maps; please improve the resolution

p. 3-15, lines 9-12: Break up this run-on sentence.

p. 3-15, line 20: Are the + signs supposed to be ± ?

p. 3-16, line 10: has -> have

p. 4-3, footnote 44: Sensitivity is *defined* as

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p. 4-15, line 30: compared to

p. 4-17, line 16: modeling is misspelled

p. 4-18, line 35: sulfur -> S

p. 4-22, footnote: modeled is misspelled