

Note to Members of the Integrated Nitrogen Committee

From: Jim Galloway and Tom Theis

Re: Additional items for Committee Discussion identified by the DFO

In going over the posted report, Angela found a number of items (49) that need to be addressed by the committee. These items are in Column C of the attached. Tom and Jim's suggestions on who should address them are in Column D. Please review this file, prior to our call on Wednesday. This is especially important for Viney/Ken, Arvin/Russ.

**Attachment: AN concerns about clarity, communication, and logic with June 22, 2009 INC draft report**

	Page	Issue	Suggested action item
1)	p.8	Table A: - what should order of effects be? Alpha?	Jim: I have ordered them.
2)	p. 8 line3	Refers to health declines but morbidity not on table. Also for citation, Why not refer to EPA/OAQPS 2009 NOx Integrated Science assessment?	Russ—check on reference; check on wording
3)	p. 8	Report emphasizes importance of climate effects (see pg 16, line 11), but they are not discussed in the table	The table has examples; it is not meant to be complete.
4)	p. 10, line 12, 13, 16, 20	Replace NR "is lost to the environment" with ??? Passim -- text using nitrogen "loss" term shaded in yellow* in track change version of report. Peer reviewers had suggested using a different term because	Angela. For this instance only, replace "lost to the environment" with "transferred to the environment"
5)	p. 12	Figure 1 -- where does human and animal waste	Human and animal waste are not new sources

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\*Angela created a track change version of the report that tracks with this list and shades "nitrogen loss" terms in yellow

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		fit in? It is emphasized so much in the report but doesn't appear in this important figure.	of Nr. Jim will make text change to stress this.
6)	p.15	4th bullet -- how does figure 2 show that the sum of outputs is 14.7 Tg?. Hard to see where "outputs" should appear	Jim. Alter text to state what the outputs are.
7)	p. 17	Report states: There is strong scientific evidence to show that Nr deposition rates of 10 – 20 kg N per hectare per year can cause negative impacts on a variety of ecosystems. Where is the evidence for this presented? citation	Jim. Add a citation
8)	p.21-22	What's the basis for the target recommendations? See comments below for section 3.4	Discuss target recommendations in structured way: - identify target goal & recommendation - described basis for deriving target recommendation - explain why recommendation is important
9)	p. 20, line 4	Refers to "critical load recommendations" but these are not defined.	Jim will revise ES
10)	p. 23	Title of section 1.1 -- Please consider renaming the section: This section doesn't seem to be about "Environmental impacts" -- It is about the Nitrogen Cascade - Nitrogen exposures, cycles, and loadings.	Renaming section is fine by Jim.
11)	p. 24, lines 16-25	This is a very minimal discussion of impacts -- the Exec Summary has more information. Report seems out of balance -- suggest saying that this report doesn't explore these impacts in depth, that it takes these impacts as a given...	Table A could be included here and Jim agrees that report should say something to the effect that impacts are well known.
12)	p. 26	Figure 3--Page 26, line 8, what does it mean to "examine the relative sizes of the various...systems where NR is stored"? Page	Jim will address

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		27, line 6-9, text reads "The ovals showing...reflect that Nr is actively transported and transformed and that as a consequence there are significant impacts on ecosystem productivity due to fertilization and acidification, often with resulting losses of biodiversity" -- graphic doesn't show those impacts.	
13)	p. 27	Rename section 1.2 something like "Overview of historical and current EPA research and risk management programs related to Nr"	Fine with Jim
14)	p. 28-29	Brief text from Reducing Risk and following sentence seems more attuned to recommendations than description of current programs. Suggestion: move to section 3.4 and use it to introduce over-arching recommendation B	Tom: This seems like a minor thing.
15)	p. 30	Suggestion -- add sentence/discussion of how the INC used input from different public groups listed.	Angela. fine; please write the material.
16)	p. 31-32	Hard to understand Table 1, compared to Figure 2 - Figure 2 seems to indicate that Total Atmospheric inputs total 10.2, not 10.0 Tg - Table 1 totals Nr inputs to the Aquatic environmental system as surface water; figure 2 refers to "coastal waters" - should the same language be used? Both total 4.8	The first bullet can be fixed (Jim) if it is not a Rounding artifact. The second bullet can be fixed (Jim).
17)	p. 32	p. 37 refers to table 1 line 10 as "cultivation-	Angela. I agree; please do a word search and

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		induced BNF" Table 1 refers to this line as "N fixation in cultivated croplands" -- the reference should be standard -- otherwise it's confusing.	make The consistent wording the former.
18)		Out of balance section 2.2.2. and 2.2. 3 - 2.2.2much less detailed and has no recommendations or findings	Viney and Ken: please respond.
19)	p. 49	Recommendation 4 is not action-oriented. It looks more like a finding than a recommendation. How about a recommendation that EPA address this issue in its the triennial <i>Reports to Congress, required by EISA</i> , first report being due in 2010?	Jim and Tom agree.
20)	p. 53	2nd full paragraph seems out of place -- it relates to adverse impacts generally, not adverse effects on nitrogen use efficiency -- shouldn't it go in section 2.4? The report would be strengthened if discussion of impacts appeared in a more central place and was more fully developed.	This suggestion is fine with Jim. Angela, please flag Viney to make the change.
21)	p.53, line and and p 54, line 5	Clarify finding and recommendation 5 pertain to "animal agricultural emissions" not just "agricultural emissions"	Viney and Ken: please respond
22)	p. 57	Why does recommendation 6 refer to phosphorus load issues? Doesn't seem connected to section text	Viney and Ken: please respond
23)	p. 60  p.61	Concern about text introducing section 2.3.1.1, i.e., "The magnitude and mechanisms of Nr deposition to the Earth's surface remain major unanswered environmental questions for the US," -- Major Uncertainty is introduced abruptly here	Russ: please respond

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		<p>-- the Executive summary takes a different tone. Hard to know what is covered here and how it relates to the major findings.</p> <p>--Generally uncertainties are discussed, but report does not communicate clear conclusion about the importance of these uncertainties</p>	
24)	pp. 60-72	<p>Section 2.3.1.1 pages 60-72 present too much background information. The major findings and recommendations are obscured by the detail. It's hard to track the major arguments and the level of detail is out of balance with other sections of the report.</p> <p>Suggestion -- move most of 2.3.1.1 to an appendix. Provide some introductory text to lead to the "conclusions on atmospheric deposition of Nr.</p>	Russ: please respond
25)	p. 63	<p>Missing recommendation? EPA should pursue a rigorous analysis of the emissions and deposition data, including identifying monitors and methods that are consistent from the beginning to the end of the record, as indicated in Recommendation D.</p> <p>- Report has no recommendation D</p>	Russ: please respond
26)	p. 73	<p>Finding 8 has a buried recommendation, which is not pulled out as a recommendation - should it be?, i.e.,</p> <p>. The current NAAQS for NO<sub>2</sub>, as an indicator of the criteria pollutant "oxides of nitrogen," is inadequate to protect health and welfare.</p>	Russ: please respond

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		<p>Serious consideration should be given to replacing or supplementing the NO<sub>2</sub> measurements and standard with NO<sub>y</sub>.</p> <p>Suggestion -- expand this discussion</p>	
27)	p. 73	Recommendations 8d-g seem overly technical and not supported directly by finding 8 or preceding text.	Russ: please respond
28)	p. 74	Difficult to track discussion in first full paragraph with table 13, i.e., 9.7 (not 9) Tg N	Arvin: please respond
29)	p. 74 p. 75	Should units be Tg N/yr?	Angela. Yes, make the change.
30)	p. 77 and first paragraph on p. 78 first two paragraphs on page 79	NR aquatic system impact discussion p. 77 -- why is it included in section 2.3.1.3?	Tom: If it is to be moved it would go into 2.4.3, p 92, but it should be run by Hans first.
31)	p. 96	Finding and recommendation 14 seem to be in the wrong place -- they relate to water programs broadly, not section 2.4.3.4	<p>AN: Suggestion, move it before section 2.4.3.3 -- it seems out of place in 2.4.3.4</p> <p>Paul Stacey: Please respond</p>
32)	p.97-98	<p>Recommendation 98 not clear and potentially problematic</p> <p><b><u>Finding 1</u></b></p> <p>Meeting Nr management goals for estuaries, when a balance should be struck between economic, societal and environmental needs, under current federal law seems unlikely.</p>	<p>AN: Language on page 97, lines 4-5 indicate that targets exceed nitrogen goals. Finding and recommendation 15 either are very general or seem to call for reductions in current targets. Is that what the INC wants?</p> <p>Paul Stacey: Please respond</p>

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		<p>Enforceable authorities over nonpoint source, stormwater, air (in terms of critical loads), and land use are not adequate to support necessary Nr controls. Funding programs are presently inadequate to meet existing pollution control needs. Furthermore, new technologies and management approaches are required to meet ambitious Nr control needs aimed at restoring national water quality.</p> <p><b>Recommendation 15.</b> <i>INC recommends that EPA reevaluate water quality management approaches to ensure Nr management goals are attainable, enforceable, and affordable and that monitoring and research are adequate to problem definition and resolution, particularly in the development of nitrogen removal technologies. This may require changes in the way EPA sets water quality criteria and some compromises in ecosystem goals to accommodate human uses of the air, land and water.</i></p>	
33)	p. 98	Major point of text box 3 not clear	<p>AN: what is the take away message about how well TMDLs work? It shows how a TMDL is being used in a place, but so what"?</p> <p>Paul Stacey: Please respond</p>
34)	p. 99	Finding and recommendation 16 relates to monitoring generally, not water quality monitoring in particular and is not supported by	AN: Suggestion -- a new section on monitoring generally could be created (i.e., 2.4.4 or be used to flesh out Overarching recommendation

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		text in 2.4.3.6. Suggestion: move it to section on monitoring more generally	C Paul Stacey and INC: Please respond
35)	p. 103	Where is the rationale for the recommendation that NO <sub>x</sub> emissions be decreased by 2 Tg N/yr?	Tom: The discussion that leads to all of the target recommendations is on pages 150-158 (or so) Russ Dickerson: Please respond
36)	p. 104	Description of biodiversity limited and somewhat general. Would be useful to have more specifics.	Jim. add additional refs so the reader Can get the details.
37)	p.95 p. 105	<p>Discussion of critical loads and thresholds not focused. Unclear whether committee is using the two concepts interchangeably</p> <p>p. 95 states Unlike the TMDL, the CL (in the US) has no regulatory framework but rather sets the threshold of Nr loading at which negative impacts have been documented.</p> <p>p. 105 states " thresholds in general and critical loads specifically for Nr effects on terrestrial ecosystems in the United States should be understood to be "quantitative estimates of exposure to air concentrations of Nr compounds below which harmful effects on specified sensitive elements within ecosystem of concern do not occur according to present knowledge"(Nilsson and Grennfelt, 1988; Heitling et al, 2001). "</p>	Jim. Make consistent.

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38)	p. 114	What's the bottom line of section 2.4.7.2? reader is left hanging	Tom: This section, and the cluster in which it is embedded, are about unintended consequences of decisions or policies. They are all cautionary—EPA has a history of wading into these kinds of things without thorough consideration.
39)	p. 114-16	Make two last paragraphs in 2.4.7.3 the primary thrust of section -- move supporting science later or put in footnote. Point is lost otherwise.	Tom: OK
40)	p. 136, line 16	Reference to 36 Tg of new nitrogen in Table 1 doesn't seem to track	Jim will change and use Figure 1 as the ref.
41)	p. 140	Section title "Managing Nr during recycling through livestock production." hard to understand. Why not use plainer language, maybe something like "Managing Nr associated with animal waste resulting from livestock production"	Tom: OK
42)	p. 140, line 22 and pages 140-141	There is no synthesis communicated about the state of knowledge about a key scientific point in the report (how much is known about N <sub>2</sub> in urea can be converted to N <sub>2</sub> .) The text and long quote are distracting and reader comes away with no sense of the bottom line. Suggestion: summarize the research and bottom line much more succinctly.	Viney: Please respond
43)	p. 147, line 20-21	Where is the citation for estimated reduction possible for coal-fired plants? A key piece supporting the target recommendation	Joanne & Russ: Please respond
	line 30	Where is citation asserting an 80-90% reduction	

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		for off road vehicles is technically achievable?  Why does the committee assume a 40% reduction for off-road sources? Where is rationale?	
44)	p. 148, line 7	Where is the supporting logic and citations for finding that excess flows into streams rivers and coastal systems can be reduced by 20%?	Ken: Please respond
45)	p. 148 Line . 12	Same question, re: "belief:" that crop N-uptake efficiency can be increased? - -where did the numbers come from	Ken: Please respond
46)	p. 149	Explanation of how estimated decreases of NH <sub>3</sub> are calculated not clear -- and it's not clear how those decreases translate into target goals	Viney: Please respond
47)	p. 151	No discussion of rationale for target recommendation 4 -- how was target set?	Paul: Please respond
48)	p. 151	Not clear how reductions would result in 25% reduction from current levels	This is obvious; no change needed.
49)	p. 158-171	Automated numbering system for findings needs to be turned off (findings are off by +20 in Appendix	Angela to fix