

PETITION		CLAIM AS SET FORTH IN PETITION	RECORD (E.G.)	TECHNICAL ASSESSMENT	BASIS FOR DENYING REVIEW*
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		<b>(B) Draft PREP 2012 Report.</b>			
31	IV.a.ii(B)	The data contained in the Draft PREP 2012 Report confirmed nitrate and TN levels had decreased markedly over the past three years, returning to 1980 levels, as extreme weather conditions were no longer occurring. This information was relevant to whether and how much nitrogen reduction was necessary and to the degree to which it should be required given the recognition that nitrate is the most important parameter in controlling excessive plant growth in the system. This same fact was verified by the October 19, 2012 response from Commissioner Burack (Figure 4) and the final PREP 2012 SOE Report at 13 (Figure 2.3) (Exhibit 25).	PREP Draft Data Report (July 16, 2012) at 45, 53, 69 (Ex. 36)). PREP 2013 SOE Report at 14 (Petitioner Exhibit 24. RTC at 24, 46, 58, and 99 (Ex. 1) (TN, not subspecies of nitrogen, is the most important parameter to control)	This statement is partly an overstatement and largely incorrect. First, it is not true with respect to TN. Adams Point is the only station for which nitrogen data exists from the 1980 period. For that station, the PREP Report found no trends in TN concentrations, and TN was not measured in the 1974-1981 period that is the basis for the comparison to 1980s levels. PREP, 2012 at 69. For nitrate at that station, the PREP report contains results for nitrate + nitrite indicating a long term upward trend but a recent lowering trend based on variance between the 2006-08 and 2009-11 periods. Id. at 45. The relevant chart in that Report shows that concentrations in 2009-11 are similar, though at the upper end, of concentrations encountered in the 1970s although not as low as 1980 levels. The pattern for DIN is similar to that of nitrate and nitrite (long term upward trend with recent lowering), PREP 2012 at 53, and was the subject of the statement in the Burack letter on this issue, as follows: "DES agrees that average annual DIN concentrations at Adams Point have decreased in the last few years and are similar to concentrations measured in the 1970s. However, as discussed previously, DIN is an inferior indicator of nitrogen pollution compared to TN because DIN is a subset of TN that is the most reactive in the environment. DIN does not include nitrogen that is incorporated into plants and organic matter. DIN concentrations can be very low during periods of high plant growth because the DIN is pulled out of the water and incorporated into phytoplankton, macroalgae, and other plants." Other stations show no recent trend for nitrate + nitrite. The Coalition cites PREP 2013 SOE Report Figure 2.3, which gives nitrogen loads by month and is not relevant to this issue. The Coalition may be referring to Figure 3.2 on page 15 which depicts DIN trends; the limitations of DIN as an indicator of nitrogen pollution are discussed above and were noted in the PREP 2013 SOE Report at 14.	Mischaracterizes/unsupported by the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
		<b>(C) 2011 Eelgrass Report</b>			
		The 2011 Eelgrass Report for the system issued on September 12, 2012 by Dr. Short demonstrated that eelgrass coverage had dramatically rebounded in Little Bay despite claimed inadequate transparency levels in that system.	NHDES 2009 Great Bay Nutrient Report. Fact sheet at 19 and 23 (Ex. 2); RTC at 4 fn 6, 93, 138-139 (Ex. 1)	Little Bay was identified as having marginal transparency in the 2009 Great Bay Nutrient Report. Great Bay Nutrient Report at 56 ("In the Great Bay, Little Bay, and Upper Piscataqua River, the Zmax is below (less than) Zmin but the difference is less than 1 meter. This result is consistent with observations that eelgrass in these areas is either declining or has recently disappeared (PREP, 2009; NHDES, 2008b)."). Little Bay had highly variable eelgrass population consistent with this marginal transparency.	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
32	IV.a.ii(C)	This was the most eelgrass present in Great Bay in over 25 years.	PREP Draft Data Report (July 16, 2012) (Ex. 36); RTC at 4 fn 6 (Ex. 1)	This is presumably a typographical error and the Coalition meant "Little Bay," as eelgrass decreased in Great Bay proper in 2011. PREP, 2012. Note Little Bay accounts for only 1-2% of eelgrass coverage in the Great Bay Estuary.	Mischaracterizes the record.
		This information (also referenced in the draft 2012 PREP report cited by EPA but for other reasons) confirms that existing water quality is not preventing eelgrass populations from recovering, as presumed by the analysis performed for the permit.	See RTC at 5 fn 7 (Ex. 1) (continued loss in eelgrass biomass); Id. at 58, 84-84, 92-93, 102-103, 109, 110 (relative to concerns with transparency in Great Bay)	The increase in 2011 is consistent with the historic short term variability of eelgrass and the marginal transparency in Little Bay and does not demonstrate a wholesale recovery of eelgrass populations, as there is still a long term trend of decline in eelgrass coverage and no recovery at all in eelgrass biomass.	Mischaracterizes/unsupported by the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's

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		<b>(D) Pictures of macroalgae growth for 2012</b>			
		The pictures of current macroalgae growth for 2012 had to be taken during the peak growing season which occurs in late fall. These pictures confirm that the level of macroalgae growth had decreased dramatically in comparison to conditions present in 2007-2008 EPA reported in the Fact Sheet.	Petitioner Exhibit 20; see RTC at 3 (Ex. 1) (macroalgae forming floating mats which can smother eelgrass).	Most of the pictures provided are of such poor quality that it is difficult to discern any useful information from them. Several of the photos show salt marsh and intertidal mudflats. The last photograph does seem to show some collection of algal material on the intertidal flats but from the quality of the photo, it is impossible to make out a species. The specific location of macroalgae blooms at any given time is less important than the frequency and total biomass of blooms since much of the nuisance algae of concern are drift or free-floating species, and their distribution can be shifted by storms or persistent winds. Thus, the lack of algae in one location at one point in time is not necessarily significant.	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. Mere speculation. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
32	IV.a.ii(D)	Given EPA's September 2, 2012 meeting with Exeter, indicating that macroalgae were now the primary cause of concern for Great Bay, Little Bay and the tidal rivers, (also reiterated in the Burack 2012 Letter) this was critical new information indicating that macroalgae growth was far less significant than originally believed.	Burack letter dated October 19, 2012, attachment at 1 and 7 (Ex. 32); RTC at 45-46 (Ex. 1)..	This claim is the opposite of the position taken by the Coalition in its comments on the permit, where it stated "the following technical conclusions have been drawn: . . .b. Macroalgae growth has significantly increased in the Great Bay over the past two decades, and this condition is adversely impacting habitat and eelgrass populations (confirmed by Art Mathieson) (Note: Such excessive macroalgae growth has not been documented in any of the Bay's tidal rivers or tied to any decline in eelgrasses in those areas.)" The Comments further argued, "The focus for the Bay restoration should be changed to macroalgae and DIN. Thus, EPA's reliance on Section 303(d) lists should be revised to indicate that the designated cause of eelgrass declines in the Bay is excessive macroalgae growth and increased DIN loadings." RTC at 44. EPA disagrees with the Coalition's characterization of this meeting as indicating a new position that macroalgae was now the primary concern. The position of EPA and NHDES has consistently been that macroalgae is one of the concerns in Great Bay, and a significant one in shallower areas, but that transparency remains a major concern and is appropriately a basis for permit limits in Great Bay. RTC at 45-46.	Not preserved. The Coalition made the opposite argument in its timely filed comments. The Coalition's attempt to characterize this as a "new" claim by EPA in order to justify changing its argument on this issue is incorrect and based on mischaracterization of the record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
		In fact, it was virtually absent in the same location considered excessive in 2008.	RTC at 3 (Ex. 1).	The lack of algae in one location at one point in time is not necessarily significant. The specific location of macroalgae blooms at any given time is less important than the frequency and total biomass of blooms since much of the nuisance algae of concern are drift or free-floating species, and their distribution can be shifted by storms or persistent winds.	Unsupported by the record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
		This occurred with a slight decrease in system TN concentrations indicating that, if TN is the factor controlling such plant growth as asserted by EPA, clearly TN levels far less restrictive than 0.3 mg/l should be sufficient to control macroalgae growth.	RTC at 97 (Ex.1).	This statement seems to contradict the characterization on the page 31 of the Petition that TN levels had "decreased markedly." In any case, EPA agrees that the 0.3 mg/l target is not determined based specifically on macroalgae control although it is expected it will be sufficient to control macroalgae. RTC at 97.	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
		<b>(E) Burack 2012 Letter</b>			
33	IV.a.ii(E)	On October 19, 2012, Commissioner Burack responded to the Coalition on the validity of key scientific issues covered in the	Burack letter dated October 19, 2012, attachment at 1	This is incorrect. The Coalition has taken isolated comments out of context to claim that they support its sweeping generalizations. The letter in fact refutes the Coalition's claims: "As	Mischaracterizes/unsupported by the record, including EPA's

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		depositions of Philip Trowbridge and Paul Currier (i.e. the information EPA refused to consider). EPA included this document as a justification for its action in its Response to Comments, while it completely ignored the parts of the letter that confirmed the disputed scientific issues raised by the Coalition were addressed by the Commissioner and admitted to be correct.	(Ex. 32); RTC at 83 fn 35 (Ex. 1)	described in more detail in the attached document, DES refutes the various claims and allegations in your August 14, 2012 letter. In summary, DES maintains that the Great Bay Estuary exhibits all the classic signs of eutrophication and that excessive nitrogen is causing or contributing to the water quality problems in the estuary. Many of the claims in your letter over-simplify the situation, exclude key information, or extrapolate site-specific results to the whole estuary." Burack letter at 1. The deposition testimony, and the invalid conclusions drawn there from, are addressed in <i>Appendix B</i> .	responses to the Coalition's comments, and therefore fails to substantively confront EPA's response.
		This included the fact that Great Bay, Little Bay, and the Piscataqua Rivers do not have a demonstrated water-column transparency problem due to nitrogen inputs.	Burack letter dated October 19, 2012, attachment at 5, 7. (Ex. 32); RTC at 84-85, 91-93.	This is incorrect. The letter does not mention Little Bay. The only reference to the Piscataqua Rivers is in the context of the Coalition's claim that "[t]ransparency in the major tidal rivers (Squamscott, Lamprey and Upper Piscataqua) is poor, but the available data (not previously analyzed by DES) show that . . . regulating TN in the tidal rivers will not result in any demonstrable improvement in transparency" because clarity is naturally poor. NHDES nowhere states that the Piscataqua Rivers do not have a transparency problem and specifically disagrees with the Coalition's claim that transparency issues are not related to nitrogen inputs. With respect to Great Bay proper, the Coalition misstates the detailed NHDES explanation of this issue: "DES agrees that while one of the reasons eelgrass still exists in Great Bay proper is the exposure of eelgrass plants to direct sunlight at low tide", but "water clarity is still important even in shallow areas: . . . [i]n shallower areas, overgrowth and smothering by macroalgae and/or cellular disruption may be the immediate cause of eelgrass loss. However, even in shallow areas, light attenuation is still an important contributing factor for eelgrass viability because sufficient light is a requirement for plant survival in all areas." NHDES also noted that "the [Coalition's] claim that Great Bay proper is not transparency limited does not mean that nitrogen does not affect eelgrass in Great Bay proper."	Mischaracterizes/unsupported by the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response.
		<b>ii. EPA ignored the fact that DES acknowledged numerous technical errors occurred in the development of the 2009 Numeric Criteria.</b>			
38	IV.b.ii	As noted earlier, EPA included the Burack 2012 Letter as part of its record justifying the selected numeric criteria and derived numeric nitrogen limits. (RTC at 85). However, EPA failed to acknowledge or evaluate that, in this letter, the State specifically acknowledged major technical errors had occurred in the development of 2009 Numeric Criteria document (precisely as the Coalition has claimed), including the exclusion of critical information from the peer review. (See Exhibit 22).	Burack letter dated October 19, 2012 at 1-2 (Ex. 32).	This is a mischaracterization of the Burack letter. The Burack letter specifically refutes the Coalition's claims. "As described in more detail in the attached document, DES refutes the various claims and allegations in your August 14, 2012 letter. In summary, DES maintains that the Great Bay Estuary exhibits all the classic signs of eutrophication and that excessive nitrogen is causing or contributing to the water quality problems in the estuary. Many of the claims in your letter over-simplify the situation, exclude key information, or extrapolate site-specific results to the whole estuary." Burack letter at 1. Nor did the Burack letter indicate that critical information had been excluded from the peer review. Rather, the letter states: "the reviewers were privy to all the comments and criticisms provided by the municipalities at the time. For the reasons stated in the attached document, DES does not believe that any of the "new" information or additional information developed by the Coalition since that time would lead to a change in findings from those of the initial peer reviewers." Id. at 2.	Mischaracterizes/unsupported by the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of all the information in the record.
38	IV.b.ii	Rather than defend the transparency-based 2009 Numeric Criteria document, DES acknowledged that transparency was not a significant ecological concern in this system but that changes in macroalgae were now the primary concern. (See Burack 2012 Letter at 1-2 ("It is correct that there have been no clear trends in	Burack letter dated October 19, 2012, attachment at 1, 7 (Ex. 32); see RTC at 84-85, 91-93 (Ex. 1).	Again this mischaracterizes the letter. Neither the Burack letter nor the attachment states that transparency is not a concern or that macroalgae is the "primary" issue or any equivalent term. The letter confirms the importance of light attenuation as the immediate issue in the deeper areas of the estuary and as an "important contributing factor" in shallower areas. Burack letter, attachment at page 7. Page 1 of the attachment discusses macroalgae in the context of	Mischaracterizes/unsupported by the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which

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		chlorophyll 'a' . . . measured in Great Bay over the full period of record from 1974 to 2011 in Great Bay").		a Coalition claim that "algal levels in the system did not change materially . . .". The letter corrects that claim to note that macroalgae is a form of algae and has clearly changed, and notes that "[f]or shallow systems, it is expected that changes in macroalgae will precede changes in phytoplankton (McGlathery et al., 2007; Valiela et al., 1997), which is what is actually happening in Great Bay." Page 7 of the attachment notes that the mechanism by which nitrogen affects eelgrass is different in different parts of the Great Bay Estuary, with macroalgae a more immediate cause of losses in shallower areas.	was rational in light of all the information in the record.
		DES further confirmed that the information supplied by the Coalition to EPA as part of the public comments did demonstrate that nitrogen control would have no meaningful impact on transparency in the tidal rivers), at 3-4, at 7 ("Great Bay itself is not a transparency limited system because eelgrass population receive sufficient light during the tidal cycle. . . . DES agrees . . ."), and at 11.	Burack letter dated October 19, 2012, attachment at 3-4, 5-6, 7 (Ex. 32) ); see RTC at 84-85, 91-93 (Ex. 1).	The Burack letter contains no such confirmation, but rather clearly and succinctly refutes this claim by the Coalition, saying: "because the assumption underlying the above GBMC statement on transparency is incorrect and invalid, the statement is also not correct." Burack letter, attachment at 4. It is difficult to see how the Coalition interprets this as a "confirmation" of the Coalition's claim. NHDES in fact reiterated its position that nitrogen control would be meaningful in the tidal rivers because of the relationship between nitrogen inputs and the organic components of turbidity (in addition to phytoplankton). NHDES explained that the Coalition's conclusion was based on the false assumption that "the only way that nitrogen affects eelgrass is through phytoplankton blooms that cause shading," but that NHDES's analyses had shown that "TN accounts for 27% of the variability in light attenuation in the tidal rivers". Id. at 5-6. With respect to the quotation from page 7 of the attachment, the quoted language is actually the Coalition's claim, which NHDES included verbatim and in quotation marks, before going on to explain why the Coalition is incorrect. In this case NHDES stated that it "agreed," not with the quoted language, but with a more limited point that "one of the reasons eelgrass still exists in Great Bay proper is the exposure of eelgrass plants to direct sunlight at low tide." NHDES went on to state that "water clarity is still important even in shallow areas." Id. at 7.	Mischaracterizes/unsupported by the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of all the information in the record.
		See Burack 2012 Letter at 5 ("The point of the graphs was to attempt to show that chlorophyll-a was not well correlated with water clarity and, therefore, that other factors such as turbidity and colored dissolved organic matter (CDOM) must be controlling light attenuation. During the deposition, DES staff agreed that the graphs support this conclusion.").	Burack letter dated October 19, 2012, attachment at 5-6 (Ex. 32)); see RTC at 84-85, 90-93 (Ex. 1).	This again is NHDES's description of the <i>Coalition's</i> point in creating those graphs. DES staff in the deposition did agree that on their face the graphs supported the point made by the Coalition. The Burack letter however indicates NHDES' disagreement with the fundamental assumption underlying those graphs (that the only way that nitrogen affects eelgrass is through phytoplankton blooms that cause shading), as well as some of the specific assumptions made in individual graphs ("unproven assumptions about Secchi disk measurements were used"), and reiterated its conclusion that TN was an important control on transparency.	Mischaracterizes the record.
39	IV.b.ii	Ignoring that DES actually concurred with the Coalition's assessment, EPA, however, asserted, without any credible supporting analysis, that the information provided in the graphs (Exhibit 1S, 1V) was somehow unreliable and did not make the demonstration that DES agrees it does make, i.e. there is no benefit to nitrogen control regarding transparency in the tidal rivers.	RTC at 90-92 (Ex. 1)	As noted above DES did not concur with the Coalition's assessment. The RTC provides a more detailed assessment of the flaws in the assumption underlying the Coalition's analyses, which do not account for the characteristics of organic matter in terms of density and optical properties when evaluating the organic component of turbidity to determine the benefit of nitrogen control.	Mischaracterizes/unsupported by the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of all the information in the record.
		EPA's position is plainly unsupported. This was the same data used in other graphs that EPA relied on in rendering its decision. (See 2009 Numeric Criteria at 58-67). It is not apparent how such data become reliable only when presented as a long term average but are not reliable when presented as a location specific plot	RTC at 90-92 (Ex. 1)	The Coalition misstates EPA's criticisms. In this case EPA has not criticized the underlying dataset but the assumptions made by the Coalition in interpreting the data to supports its claims, including failing to account for the differing density and optical properties of organic versus inorganic matter. The Coalition has not responded to the specific issues raised in EPA's response.	Mischaracterizes/unsupported by the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which

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		with averages for data intervals. EPA's rejection of this information explains nothing in its response.			was rational in light of all the information in the record.
		Had EPA properly reviewed this letter and objectively reported the admissions of the author of the 2009 Numeric Criteria document, EPA should have reached a conclusion that the entire premise of this permit, that nitrogen must be reduced to improve transparency in the Great Bay Estuary, was a fundamentally flawed determination.	Burack letter dated October 19, 2012, attachment at 5-6 (Ex. 32)); see RTC at 84-85, 90-93 (Ex. 1).	The premise of this hypothetical is incorrect, as it is based on a mischaracterization of NHDES' statement.	Mere speculation.
		<b>iii. EPA overlooked the significance of the draft PREP 2012 Report refuting findings of the 2010 WLA document.</b>			
		The 2010 WLA document was primarily based on reducing increased nutrient levels that had occurred during extreme rainfall conditions in 2005 - 2008. (See 2010 WLA Report Tables at 1-10).	NHDES 2010 Load Reduction Report, Appendix C at Table 3 (Ex.42); Petition Exhibit 1Y; see RTC at 17, 188 (Ex. 1).	This claim mischaracterizes the document. The 2010 Loading Reduction Report is based on three two-year periods: 2003-04, 2005-06 and 2007-08. (NHDES 2010 Appendix C at Table 1-10). 2003-04 had close to average rainfall, 2007 was somewhat high and 2005-06 and 2008 were unusually high. (Petition Exhibit 1Y). The Report shows required load reductions for each of the three two-year periods; even in 2003-04 a permit limit of 3 mg/l and NPS reduction of over 30% would be needed to achieve the eelgrass protection target in the Lamprey River. (NHDES 2010 Appendix C at Table 1-10).	Not preserved, as comments did not attack Load Reduction Report on this basis. To extent preserved, the claim mischaracterizes Load Reduction Report.
40	IV.b.iii	As noted in the Coalition's comments, these extreme rainfall conditions were outside the range of conditions intended to be controlled by water quality objectives.	RTC at 100, 104 (Ex. 1); NHDES 2010 Load Reduction Report, Appendix C at Table 3 (Exhibit 42); see also RTC at 17, 188 (Ex. 1).	EPA disagrees with this statement as a technical matter for the following reasons: (1) the use of long term data sets for the NHDES analyses was an appropriate approach to variability in rainfall conditions and mitigates the impact of extreme rainfall conditions in the dataset (RTC at 105); (2) water quality objectives are not based just on average years (RTC at 100); (3) the loading analyses show the need for stringent permit limits and significant NPS reductions even in typical rainfall periods (e.g. 2003-04) (NHDES 2010 Appendix C at Table 1-10); and (4) given the increasing trend in precipitation it is inappropriate to characterize the frequency of such precipitation events based only on the historic record (RTC at 105; see also Petition Exhibit 1Y)	Not preserved, as comments only went to general concept that most extreme years should not be considered, with no specific applicability to the Load Reduction Report. To extent preserved, the claim mischaracterizes Load Reduction Report. Mischaracterizes/unsupported by the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of all the information in the record.
		These were once in a hundred year rainfall events that produced dramatically higher nitrogen and nitrate loadings into the system as would be expected.	RTC at 100, 105 (Ex. 1); NHDES 2010 Load Reduction Report, Appendix C at 5 (Exhibit 42)	EPA does not agree with the characterization of the entire four year period of 2005-2008 as "hundred year rainfall events" and notes that characterization was not made in the original comments. EPA agrees that as a general matter wetter years have resulted in higher total nitrogen loads than drier years in this system (RTC at 105), but also notes that loading thresholds are higher in wetter years as well, so that required reductions are similar across all periods studied (NHDES 2010 Appendix C at 5) . The impact of rainfall variability is addressed in the NHDES analyses through the use of long-term data sets. (RTC at 105). This included the Loading Reduction Report use of three two-year periods (2003-04 in addition to 05-08).	Not preserved. Mischaracterizes/unsupported by the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of all the information in the record.
40	IV.b.iii	Using this condition as a the basis for determining the degree of nutrient reduction required, EPA projected that major non-point	RTC at 24 (Ex. 1); NHDES 2010 Load Reduction	This claim mischaracterizes the RTC and the NHDES 2010 Load Reduction Report. The conditions used in EPA's projection were for average loads over each of three two-year	Not preserved, as comments did not attack Load Reduction Report

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		reductions were needed, in addition to stringent point source limitations. (RTC at 24).	Report, Appendix C at 5, Table 3 (Exhibit 42)	periods, not for a 2005-08 period as cited by the petitioner. (RTC at 24). Major nonpoint sources reductions in addition to stringent point source limitations are required in all three periods considered (NHDES 2010 Appendix C at Table 1-10), and the required reductions were similar over all three periods (id. at 5).	on this basis. To extent preserved, the claim mischaracterizes the Load Reduction Report. Mischaracterizes/unsupported by the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of all the information in the record.
		However, the 2012 PREP Report contained new data demonstrating that since 2009 – 2011, when wet conditions existed in the watershed (but not extreme conditions), the nitrogen concentrations and loadings in the estuary dropped drastically.	PREP Draft Data Report (July 16, 2012) at 30 (Ex. 36); see also PREP 2013 State of the Estuaries Report, Figure 2.2 (Petitioner Exhibit 24).	EPA agrees that the drier years of 2009-11 have lower nitrogen loads than the period of 2005-08, but disagrees with the claim that the recent data is outside the range of conditions considered in the NHDES 2010 Loading Reduction Report. As shown in Table NUT-1 of the 2012 PREP Report, the average total nitrogen load 2009-11 is approximately the same as in the 2003-04 period.	Mischaracterizes the record, including the 2012 report and 2010 Load Reduction Report.
		EPA, itself, used the 2009-2011 information when it estimated the proportion of the load that was due to various sources in the system. (See RTC at 106).	RTC at 106 (Ex. 1); citing PREP 2009 State of the Estuaries Report at 13(Ex. 19); PREP Draft Data Report (July 16, 2012) at 27 (Ex. 36).	This statement does not accurately characterize the Response to Comments, in that EPA's estimate of the proportion of load due to various sources was specifically based on the PREP 2009 State of the Estuaries Report. (RTC at 106). EPA did note, however, that the 2009-11 information was entirely consistent with the figure in the 2009 Report (32% point source in 2009-11, as compared to 31% point source reported in the 2009 Report).	Mischaracterizes/unsupported by the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of all the information in the record.
		These much lower system wide loadings were also demonstrated in the attachments to the Burack 2012 Letter. Figure 4.	Burack letter dated October 19, 2012, attachment at 17 (Ex. 32)	Figure 4 to the Burack letter does indicate significant lower loads in 2009-11 than in 2005-06, but only moderately lower loads than 2007-08 and similar loads to 2003-04.	Mischaracterizes the record.
		However, the system baseline load occurring 2009-2011 was acknowledged by the Burack 2012 Letter to be far lower than the 2005-2008 period, thereby requiring far less pollutant reduction.	Burack letter dated October 19, 2012, attachment at 11 (Ex. 32)	The Burack 2012 letter is not accurately characterized. The letter itself does not comment on the extent of system baseline loads, but does state (in the attachment at page 11): "The average TN concentration in 2009-2011 is only 14% lower than in 2006-08, which is most logically explained by reduced nitrogen loads as a result of more normal rainfall amounts during this period (PREP, 2012 at 30)." (Petition Exhibit 22)	Mischaracterizes the record.
		As EPA's load reduction requirements and treatment decisions in Great Bay were based on a set of dated, transient, extreme weather conditions not representative of typical conditions governing eelgrass health, EPA's entire reliance on the 2010 WLA document was misplaced. EPA's flip flopping between the 2009-2011 baseline and the extreme wet weather conditions of 2006-2008 show that the agency simply failed to grasp the significance of the issue in regulating facilities in the watershed.	NHDES 2010 Load Reduction Report, Appendix C at 5 and Table 3 (Ex. 42); Petition Exhibit 1Y	This is incorrect. As noted above the 2010 Loading Reduction Report included the 2003-04 period and the 2009-11 period loads are similar to that earlier period. Further, the load reduction requirements are not dependent simply on loads but also on the loading thresholds calculated to meet the target TN concentrations. Wetter years have both higher loads and higher loading thresholds (due to increased hydraulic flushing) and therefore required reductions are not dramatically different across the different time periods (e.g. to meet the eelgrass target in Great Bay, the required reduction in the Lamprey River was 20% in 2003-04, 28% in 2005-06, and 21% in 2007-08). (NHDES 2010 Appendix C at 5). In addition, an entire four year period cannot be characterized as extreme and excluded from loading analyses.	Mischaracterizes the record.

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40	IV.b.iii	In fact, the 2012 PREP Report (Figure 3.2) and Burack 2012 Letter (Figure 7) confirmed that current nitrate and TN levels are at or below the levels considered sufficient to ensure excessive macroalgae growth does not occur in this system (the main concern cited in the Burack 2012 Letter). Therefore, EPA's failure to understand or consider how this information dramatically altered nitrogen reduction requirements (assuming TN is causing impairments) lead to regulatory determinations on this permit which are clearly flawed and need to be reconsidered.	PREP Draft Data Report (July 16, 2012) at 69 (Ex. 36); Burack letter dated October 19, 2012, at 1, 7 (Ex. 32); RTC at 59, 98, 100 (re use of historic comparisons); 24, 46, 58, 99 (need to consider TN); 32 (Coalition asks that permit limit be based on macroalgae)	This is incorrect. TN concentrations at the Adams Point station have been above the 0.34 to 0.38 mg/l range identified in the <i>Great Bay Nutrient Report</i> for macroalgae control in four out of the last five years. PREP, 2012 at 69. Neither NHDES nor the Coalition has identified a nitrate level "sufficient to ensure excessive macroalgae growth does not occur"; the basis for the Coalition's claim seems to be comparison to historic levels and did not appropriately account for changes in nonpoint sources. NHDES did note that recent DIN results at Adams Point are close to 1970s levels but DIN is highly variable and is not considered a reliable indicator (see IV.a.ii(B)). The Coalition's timely filed comments urged EPA to find a macroalgae impairment (RTC at 32) and argued that permits limits of 8 mg/l were appropriate for macroalgae control. The Burack letter does not indicate macroalgae is the "main concern". See IV.A.ii(D).	Mischaracterizes/unsupported by the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of all the information in the record.
41	IV.c	<b>c. EPA Failed to properly apply the State's narrative standard.</b>			
		Throughout the Response to Comments, EPA presumes, but does not ever demonstrate, that (1) TN caused use impairments exist and (2) the numeric criteria developed in 2009 constitutes a proper application of the State's narrative standard.	Fact sheet at 12-27 (Ex. 2); RTC at 83-94 (Ex. 1)	EPA's conclusion that TN-caused impairments exist is not a "presumption" but a technical conclusion based on consideration of the relevant evidence, including: extensive scientific literature concerning nitrogen related impacts to eelgrass communities and estuarine environments; monitoring data from the Lamprey River and the Great Bay Estuary, site specific studies performed by the NHDES in the 2009 Great Bay Nutrient Report; site specific data and trend analysis developed by PREP; recommended DIN thresholds in EPA guidance, nitrogen thresholds developed in other states (MA and DE), and 303(d) listing materials.	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review because merely restates claim and makes mere allegations of error.
		First, there is no information confirming that eelgrass losses in this system are anything but naturally occurring. EPA simply assumed the eelgrass reductions were TN induced because this has occurred in other systems. While it is true that eelgrass populations declined since 1996 (the peak eelgrass level ever documented) this does not lead inexorably to a conclusion that nitrogen caused the decline. That has to be proven with some reasonable scientific certainty considering the available site-specific information but was not. (RTC at 72 discussing the need to base decisions on site-specific information, when available.) <sup>45</sup>	Fact sheet at 12-27(Ex. 2); RTC at 83-94 (Ex. 1)	EPA's technical conclusion that nitrogen discharges have caused or contributed to the observed impairments is not an "assumption" based on "no information." EPA's conclusion on this point was based on extensive scientific literature concerning nitrogen related impact to eelgrass communities and estuarine environments; monitoring data from the Lamprey River and the Great Bay Estuary, site specific studies performed by the NHDES in the 2009 Great Bay Nutrient Report; site specific data and trend analysis developed by PREP; recommended DIN thresholds in EPA guidance, nitrogen thresholds developed in other states (MA and DE), and 303(d) listing materials. Fact sheet at 12-27; RTC at 83-94. The fact of decline in eelgrass populations since 1996 is not considered in isolation but in connection with all the relevant evidence. The Coalition's disagreement with EPA's finding is inherently a difference in technical judgment that does not demonstrate clear error.	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review because merely restates claim and makes mere allegations of error.
		Footnote 45. Under oath, Mr. Trowbridge testified that the 2006 flood conditions could have caused the rapid eelgrass declines that lead to the listing of Great Bay and lower tidal rivers as eelgrass impaired. (Exhibit 2 at 6-9). The Burack 2012 letter attempted to refute this point but it is apparent that this is the only rational explanation offered for why eelgrass populations crashed that year. No excessive algal blooms were noted in 2006 which would have implicated nitrogen as the cause. The supplemental data ignored by EPA did note that transparency in	Trowbridge deposition at 381-84 and 436 (Petitioner Exhibit 12); Burack letter dated October 19, 2012, attachment at 8 (Ex. 32); RTC at 105 and 111 (Ex. 1).	The Trowbridge deposition testimony states only that the 2006 flood could have had an impact on eelgrass loss between 2006 and 2007; it does not state that those flood conditions could have caused the "declines that lead to the listing of Great Bay". (EPA notes that Exhibit 2 does not relate to this issue and the Coalition may have meant to refer to Exhibit 15). The Burack 2012 letter provides a clear explanation of why the Coalition's position is incorrect, stating that the impairment relates to the long term decline in eelgrass, that the 2006 loss is simply short term variability within the overall long term decline, and that even if the years 2006-08 were disregarded there would still be a statistically significant decline in eelgrass. The supplemental data purporting to show that color inputs were also high in connection with the 2006 floods	Not preserved as to deposition testimony. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board

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		the Bay was extremely poor due to the large color inputs from the tidal rivers - the highest in 100 years. (Exhibit 2). That condition was extreme enough to affect eelgrass broadly and over an extended period.		does not change this conclusion, because the analysis relied on by EPA is based on the long term trends and not the short term variability associated with variable precipitation. The deposition testimony, and the invalid conclusions drawn therefrom, is discussed in <i>Appendix B</i> .	review because merely restates claim and makes mere allegations of error. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
42-43		Absent such information, there is no basis to claim eelgrass populations constitute a violation of the state's narrative standard. As acknowledged by Mr. Currier and Trowbridge under oath, if the eelgrass fluctuation was caused by the 2006 flooding event or some other natural condition caused by high color entering the system, that decline in eelgrass would be natural and therefore not a violation of existing state narrative standards. (Exhibit 15 at 1-2 and 6-8).	Burack letter dated October 19, 2012, attachment at 8 (Ex. 32); RTC at 105 and 111 (Ex. 1).	This is merely a counterfactual hypothetical. As NHDES has made clear, the findings of impairment in the decline of eelgrass are based on a long term trend since the 1990s and are not based on a short term decline associated with the 2006 wet weather. The long term trend is evident even if the 2005-08 period is excluded from the data. A long term trend beginning in the 1990s cannot be caused by a 2006 event. The deposition testimony, and the invalid conclusions drawn therefrom, is discussed in <i>Appendix B</i> .	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review because merely restates claim, makes mere allegations of error and is speculative and conjectural. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
43	IV.c	Second, with respect to TN-induced transparency decrease as the cause of eelgrass losses, that conclusion rests on eelgrass losses in Great Bay and in the lower Piscataqua River.	RTC at 84-85 (Ex. 1); NHDES 2009 Great Bay Nutrient Report at 56 (Ex. 43); Fact sheet at 19 (Ex. 2)	This is incorrect. The analysis of the relationship among transparency, TN and eelgrass loss encompassed areas of the Great Bay Estuary beyond the Great Bay and lower Piscataqua River.	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review because merely restates claim and makes mere allegations of error. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
		However, EPA points to no information presented in the record showing that Great Bay is a transparency limited system (Burack 2012 Letter confirms it is not) or that the existing tidal river transparency levels support eelgrass growth under natural conditions (Burack 2012 Letter confirms it does not).	RTC at 84-85 (Ex. 1); NHDES 2009 Great Bay Nutrient Report at 56 (Ex. 43); RTC at 45 (Ex. 1)	This is incorrect. EPA's conclusions are based on information, noted in the Fact Sheet and RTC, indicating that transparency in Great Bay proper is marginal, consistent with the decline (but not complete eradication) of eelgrass and the expert opinion that shallow eelgrass beds, while receiving sufficient light during low tide periods, are still impacted by low transparency. The record also contains information that indicates that the tidal rivers supported eelgrass under natural (less developed) conditions and that changes in water quality that impede eelgrass are not natural in origin.	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks

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	IV.c.				specificity necessary for Board review because merely restates claim and makes mere allegations of error.
		Both EPA and DES have admitted, CDOM and turbidity occurring in the tidal rivers originates from natural sources (Deposition Exhibit 85) and that the resultant transparency from these conditions is insufficient to support eelgrass (Burack 2012 Letter at 5; therefore, these conditions do not constitute a violation of the State’s narrative criteria as explained by Mr. Currier (Exhibit 2 at 5) (regardless of whether or not additional nitrogen loadings worsen, these existing naturally, insufficient transparency levels).	RTC at 45 (Ex. 1)	While CDOM is natural, current turbidity is largely anthropogenic and is related to development in the watershed as well as nitrogen inputs. To the extent that current transparency from CDOM and turbidity is insufficient to support eelgrass in the tidal rivers this is not considered a natural condition.	Not preserved as to deposition testimony. Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
		Moreover, as noted in the Burack 2012 Letter and in the extensive documentation provided to EPA with the Coalition’s comments, Great Bay is not a transparency limited system due to the extensive daily tidal variation, which allows eelgrass to receive sufficient light for growth. EPA’s Response to Comments itself acknowledged this point. Therefore, the Region’s conclusions that transparency is a source of narrative criteria violation due to eelgrass declines fluctuations in Great Bay is directly contrary to the conclusion that eelgrass in these areas are not generally transparency limited. Therefore, the Region’s assumption that TN-induced transparency caused the eelgrass declines in Great Bay and constituted a narrative criteria violation triggering the need for TN controls under Section 122.44(d) is plain error. <sup>47</sup>	RTC at 84-85 (Ex. 1)	EPA disagrees with the characterization of Great Bay proper as "not a transparency limited system." This is not a specific technical finding but a colloquial description the Coalition and others appear to have used to describe Great Bay. The RTC did not acknowledge this point, as may be obvious from the Coalition's failure to cite to a specific page where this supposed acknowledgement was made. EPA agrees that there is information that Great Bay has extensive shallow areas, shallower than the 2 meters used to assess the transparency target for total nitrogen, and that in shallow areas eelgrass receive direct sunlight during low tides that mitigates the impacts of reduced transparency. However EPA rejected the Coalition's claim that this indicated nitrogen was not causing eelgrass declines in Great Bay proper. Declines in shallow areas have also occurred and are consistent with the array of impacts from nitrogen loads via macroalgae, toxicity effects, and transparency impacts.	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review because merely restates claim and makes mere allegations of error. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
44		Footnote 47. Critical information disclosed during DES depositions indicated that EPA requested that DES declare Great Bay nutrient impaired in 2009 to avoid a threatened lawsuit from CLF. DES complied with EPA’s request by stating that it could use the draft 2009 Numeric Criteria as the basis for declaring nitrogen was causing the eelgrass declines in the system.	Petitioner Exhibit 12 (Currier Deposition at 78-79; Trowbridge Deposition at 63-64 , 302-03)	It is not clear why the Coalition fails to cite specific page numbers for these deposition citations. EPA's review indicates that this reference may be to pages 78-79 of the Currier deposition and pages 63-64 and 302-03 of the Trowbridge deposition, where the deponents state that EPA did make that request to avoid a threatened lawsuit from CLF. The rest of this claim - that "DES complied with EPA's request by stating that it could use the draft 2009 Numeric Criteria" - does not appear in the depositions; in fact Mr. Trowbridge's deposition indicated that it was simply a matter of timing, as they would most certainly list that impairment in 2010. Trowbridge deposition at 65.	Not preserved as to deposition testimony. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review because unclear and makes mere allegations of error. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.

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	IV.c.	<p>Third, with regard to nitrogen effects on water-column transparency, DES confirmed (as did the draft 2012 PREP report cited by EPA) that inorganic nitrogen levels that had increased over time in the system did not cause a significant increase in water-column algal growth. If increased algal growth did not occur in response to changes in TN level in Great Bay, it is axiomatic that TN could not have caused a major decline in water column transparency.<sup>48</sup> As nitrogen never caused the alleged increase in algal (phytoplankton) levels, it is clear that regulating nitrogen as proposed by EPA will not cause a material decrease in the algal levels in this system. Therefore, nitrogen is plainly not a parameter that significantly effects water column transparency due to excessive algal growth so it cannot be regulated under Section 122.44(d) as having caused a narrative criteria violation.</p>	<p>RTC at 84-85 (Ex. 1 Burack letter dated October 19, 2012, attachment at 1-4 (Ex. 32)</p>	<p>The Coalition's argument is based on a misunderstanding of the relationship between transparency and the growth of various forms of algae. The transparency analysis is not [Nitrogen --&gt; chlorophyll-a --&gt; reduced transparency]. Rather, the mechanism is [Nitrogen --&gt; increased algae (macroalgae and phytoplankton) and plant growth --&gt; increased particulate organic matter and chlorophyll-a in the water column --&gt; reduced transparency]. Therefore the fact that there are "no clear trends in chlorophyll-a (a specific measurement of phytoplankton) measured in Great Bay over the full period of record from 1974 to 2011" (the actual statement made by NHDES) does not have the "axiomatic" impact expressed by the Coalition. In fact algal growth has clearly occurred in Great Bay in terms of macroalgae even if there is not a statistically significant trend in chlorophyll-a; and both forms of algae are involved in declining water column transparency. The target TN concentration is based on a direct relationship between TN and measured light attenuation and is not predicated on an assumption of a specific impact on chlorophyll-a levels. Great Bay Nutrient Report at 67. Therefore, and as NHDES specifically stated, the Coalition's conclusion that transparency could not have increased in response to TN if chlorophyll-a did not increase is "not correct" because it is based on an "incorrect and invalid" assumption. Burack letter, attachment at 1-4. EPA also notes that the fact that nitrogen loads declined somewhat between 2008 and 2011 reduces the significance to be given to an unclear trend in chlorophyll-a; as noted in the RTC chlorophyll-a did exhibit a significant increasing trend until 2008 (a time period where nitrogen loads were consistently increasing), but has leveled off when the data to 2011 is included (a period in which nitrogen loads declined). In addition, as PREP notes in the 2012 data report, "Phytoplankton blooms are episodic and variable in size depending on a variety of factors. As a result, it can be difficult to detect trends in chlorophyll-a based on a monthly monitoring program." PREP, 2012 at 86. The Great Bay Nutrient Report found a correlation between TN and chlorophyll-a using the 90<sup>th</sup> percentile chlorophyll-a concentration (note the PREP Report shows average concentrations). Great Bay Nutrient Report at 35-36.</p>	<p>Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.</p>
		<p>48 EPA emails with the State confirmed that EPA knew that methodologies employed in the 2009 Nutrient Criteria document were not based on a cause-and-effect demonstration but were mere correlations.(Exhibit 6)</p>	<p>RTC at 10-11, 78, 85 (Ex. 1).</p>	<p>The emails cited are consistent with EPA's repeated position, that correlations do not in isolation prove causation, but are one component of a weight of evidence approach that in its entirety may be used to show the relationship between causal (nitrogen loadings) and response variables (e.g., dissolved oxygen impairment and chlorophyll-a levels) in the receiving waters. .</p>	<p>Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.</p>
45		<p>This analysis ignored the other factors that primarily controlled transparency (e.g., water, color and turbidity) and simply attributed all of those influences to TN.</p>	<p>NHDES 2009 Great Bay Nutrient Report at 61-66 (Exhibit 43); RTC at 85; NHDES, Response to Public Comment on the Draft 2012 Consolidated Assessment and Listing Methodology (CALM) (Ex. 37)</p>	<p>This is incorrect. The Great Bay Nutrient Report contains an extensive analysis of the impact of water, color and turbidity on transparency at pages 61-66, focusing particularly on the critical relationship between turbidity and TN. Further while this Report did not independently assess color, NHDES subsequently analyzed color impacts further and determined that the correlations in the Report were also valid within salinity zones (salinity being a proxy for color).</p>	<p>Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.</p>
		<p>Footnote 50. Likewise, EPA cannot rely on the eelgrass impairment designation for Great Bay and the tidal Rivers. The</p>	<p>NHDES Methodology and Assessment Results Related</p>	<p>This is untrue. The standard for eelgrass impairment is based on the loss of eelgrass area and was established prior to the development of the 2009 Great Bay Nutrient Report. This</p>	<p>Mischaracterizes and/or ignores portions of the record, including</p>

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		record confirms that EPA allowed that designation to occur based specifically and solely on the failure of the waters to meet the unadopted numeric criteria contained in the 2009 document. (Deposition Exhibit 36). That action plainly violated 40 C.F.R. § 131.21.	to Eelgrass, 2008 (Ex. 44); NHDES 2012 303(d) List Technical Support Document (Ex. 45).	standard has been used since at least the 2008 303(d) listing process, when Great Bay was listed as "threatened" based on eelgrass decline. The same standard was used in the 2012 listing process. The 2009 NHDES Great Bay Nutrient Report does not in fact contain a standard for determining "impaired" status for eelgrass coverage.	EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
56	V.	<b>V. Scientific Argument</b>			
56	V.	EPA generally provided vague responses to the detailed technical observations made by the Coalition or EPA simply relied on generalizations about the expected impacts of nutrients in systems rather than addressing documented impacts, or lack thereof, in the Great Bay system.	RTC at 82-94 (Ex. 1)	EPA's responses totaled 178 pages of which approximately 70 were devoted to detailed responses to the Coalition's comments. As just one example, EPA's response to a single paragraph of the Coalition comments regarding transparency and eelgrass loss (Comment 24 at RTC page 82) consisted of eleven pages of detailed discussion of the available data, the flaws in the Coalition's analyses, and the basis for EPA's conclusions relying on specific data from the Great Bay system.	Mischaracterizes the record, specifically the allegation that EPA relied on generalizations.
56	V.	The Board should note that unlike the Upper Blackstone case, EPA had no working water quality model for transparency, macroalgae impacts/growth, algal kinetics or nutrient transport, or dissolved oxygen dynamics for anywhere in this system.	RTC at 124 (Ex. 1)	The Coalition does not accurately describe the straightforward mesocosm nutrient loading model that was the basis for the permit limits in the Upper Blackstone case. The MERL model was not a model of Narragansett Bay but a laboratory mesocosm experiment. The responses seen in the MERL model are completely consistent with the responses actually measured in Great Bay based on a wealth of empirical data. These empirical data are as good or better than laboratory experiments.	Not preserved. Comments did not characterize the UBWPAD model. Mischaracterizes the record, specifically the nature of the UPWPAD modeling.
56	V.	EPA has numerous published guidance documents and SAB recommendations that explain it is necessary to develop such tools in order to properly consider the factors that affect whether and where elevated nutrient concentrations may cause adverse effects and to develop scientifically defensible nutrient reduction requirements.	RTC at 9-10 (EX. 1); EPA Nutrient Technical Guidance, 2001 at 9-2 (Ex. 9).	The Coalition provides no references for this proposition, and this claim is inconsistent with EPA's published position on the role of water quality models, as described at RTC pages 9-10. EPA notes that a text search of the SAB document reveals no mention of transparency; macroalgae impacts/growth; algal kinetics; nutrient transport; or dissolved oxygen dynamics. As EPA states in its Numeric Nutrient Criteria Technical Guidance, "Frequently, the impression is given that the only credible water quality modeling approach is that of mathematical process-based dynamic computer modeling. This is not the case." (EPA, 2001 at 9-2).	Lacks specificity necessary for Board review. Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
56	V.	Footnote 57. The only transparency "model" for the estuary was developed by Morrison for Great Bay. That model, ignored by EPA and the Peer Review, confirmed on average algal growth controlled 12% of the transparency occurring in Great Bay. There was no evaluation of how much TN reduction would need to occur to affect algal growth in the Bay which is currently very low.	RTC at 90-93 (Ex. 1); Fact sheet at 18, 19, 21, 287 and 28 (Ex. 2); NHDES 2009 Great Bay Nutrient Report at 61-66 (Ex. 43)	The Coalition correctly cites the transparency "model" developed by Morrison for Great Bay. That model describes the relationship between chlorophyll-a (a specific measure of phytoplankton, not of all algal growth), turbidity, CDOM and transparency. With respect to the other "evaluation" the Coalition claims did not occur, such evaluations took place and were discussed at length in the Fact Sheet and RTC. The impact of TN reduction was evaluated in the 2009 Great Bay Nutrient Report, which used the Morrison model along with evaluation of the relationships (i) between transparency and eelgrass survival and (ii) between total nitrogen concentrations and transparency, to evaluate what TN concentration would be required to improve transparency in the Great Bay system. TN was determined to be related to both chlorophyll-a and the organic components of suspended sediment. The 2010 Loading Reduction Report evaluates how much TN load reduction would be necessary to achieve the target TN concentration in all areas of the Great Bay system. The Coalition mischaracterizes the record regarding algal growth, as there is clear growth in macroalgae.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
56	V.	Rather than perform such detailed evaluations or even carefully inspect the site-specific data, EPA relied upon generalized conclusions from DES that overlooked the specific habitat, biological, and chemical factors that must be considered to derive	RTC at 9-10, 76-77 (Ex. 1).	The Coalition's preference for more detailed mathematical process-based modeling does not indicate that NHDES' detailed site-specific analyses are no more than "generalized conclusions."	Unsupported by the record.

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		scientifically defensible conclusions with respect to nutrients and the parameters of concern (dissolved oxygen, transparency, and macroalgae).			
57	V.a.	<b>a. Nitrogen controls will not achieve transparency targets due to naturally occurring CDOM and turbidity</b>			
57	V.a.	EPA concluded that stringent nitrogen limitations must be applied to significantly improve transparency and to allow eelgrass restoration to occur within the tidal rivers and Great Bay. (See RTC, Passim).		This is correct; EPA concluded that nitrogen limitations are necessary in order for eelgrass restoration to occur.	
57	V.a.	However, EPA’s Fact Sheet acknowledges the reason eelgrass have disappeared from this system is “unknown” and tidal river losses occurred sometime after the 1940s. (See Fact Sheet at 17, 25). Thus, on its face, EPA’s assertion that transparency from changing TN levels caused the eelgrass losses is inconsistent with the Fact Sheet acknowledgement that the cause of eelgrass loss in the system is unknown.	Fact Sheet at 17, 25 (Ex. 2); RTC at 46 (Ex. 1).	This statement mischaracterizes EPA's position. EPA’s statement that the cause of eelgrass loss is “unknown” was specific to the tidal rivers and does not apply to other portions of the estuary, including Great Bay proper. EPA has not asserted that changing TN levels caused the eelgrass losses in the tidal rivers because there is no information concerning when and how those eelgrass beds disappeared. The lack of information concerning the timing and cause of eelgrass loss in the tidal rivers does not change EPA's position that limits should be as stringent as necessary to restore eelgrass in these areas, which historically contained eelgrass.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
57	V.a.	In response to EPA’s claims, the Coalition provided site-specific studies and data showing the following: (1) that transparency in many tidal river areas today is naturally poor and insufficient to maintain eelgrass growth regardless of the effect of algal growth on transparency, . . .	RTC at 91-93 (Ex. 1)	EPA disagrees with the Coalition's interpretation of the studies and data. While there is evidence that there are other factors - turbidity and CDOM - impacting transparency in the tidal rivers, EPA disagrees with the unsupported conclusion that transparency in the tidal rivers is "naturally" insufficient for eelgrass growth. Current turbidity in the tidal rivers is not "natural" but has numerous anthropogenic sources. With respect to CDOM, EPA concluded that the fact that eelgrass beds historically existed in the tidal rivers indicated that naturally occurring CDOM did not render the tidal rivers insufficiently transparent to maintain eelgrass growth, and that available information indicated that natural CDOM would be expected to have decreased (with wetland loss due to development in the watershed) rather than increase over time.	Unsupported by the record. At most, a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part, because EPA's decision was rational in light of the entire record.
57	V.a.	(2) there is no data showing changing nitrogen levels caused any change in algal growth (the main assumption underlying the claimed need for TN reduction)	RTC at 85 (Ex. 1).	The basis for EPA's conclusion of a causal relationship between nitrogen concentrations and algal growth is set forth in detail at RTC page 85. The tidal rivers clearly have excessive phytoplankton growth as indicated by high chlorophyll-a concentrations (up to 145 ug/l in the Lamprey River) and the 303(d) listing of the Lamprey River for chlorophyll.	Bona fide difference of technical opinion that does not demonstrate clear error on EPA's part, because EPA's decision was rational in light of the entire record.
57	V.a.	(3) the short detention time in the estuary did not lend itself to promoting algal growth.	RTC at 99 (Ex. 1); id. at 94 (Lamprey River Chlorophyll-a Range (ug/l) = 0.33 - 145.45 ug/l)	The short detention time was raised in the comments only in the context of whether organic nitrogen plays a role in plant growth. The Coalition argued that organic nitrogen would not become bioreactive within the detention time of the Lamprey River; EPA cited studies indicating that a substantial portion of organic nitrogen becomes bioavailable within two days, close to the Lamprey River detention time of 1.5 days cited by the Coalition, and clearly within the longer detention time in Great Bay. To the extent that the Coalition is making a new argument that algal growth will not occur in the tidal rivers due to the short detention time, this claim was not preserved and is contradicted by the data demonstrating high chlorophyll-a concentrations in the tidal rivers.	Not preserved. The only context in which detention time was raised was in connection with the claim that organic nitrogen would not be utilized for plant growth given the short detention time, not that algal growth generally would not occur. Mischaracterizes the record, including EPA's responses to comments, and therefore fails to

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					substantively confront EPA's response, which was rational in light of the entire record. This claim is incorrect as a factual matter, because the tidal river data in the record demonstrate algal growth in those systems.
57	V.a.	Therefore controlling nitrogen would have no meaningful effect on the long-term average transparency levels DES and EPA state were necessary to allow eelgrass growth. (See RTC at 45-46 comment 7c).	RTC at 91-93, 114, 115 (Ex. 1).	The statement is incorrect with respect to Great Bay proper. RTC at 91-93. As discussed in the RTC, to the extent other water quality issues also impact eelgrass growth these are not natural conditions. RTC at 114. Chlorophyll-a concentrations in the tidal rivers are high and clearly would affect transparency. RTC at 115.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
58	V.a.	In response, EPA disparaged the data sets showing transparency was insufficient regardless of the degree of algal growth, did not respond to any comments with regards to system hydrodynamics and its importance on regulating algal growth, and discounted that natural conditions were presently limiting transparency because the Coalition had not proven what had changed since the 1940s to cause the loss of eelgrass.	RTC at 84-85, 91-93; see also RTC at 105 (regarding incorrect claim that loads were "recalculated") (Ex. 1)	EPA did not disparage the <i>datasets</i> regarding transparency but rather the analysis and conclusions drawn from those datasets by the Coalition, a technical dispute that does not constitute clear error. EPA notes that the use of the term "system hydrodynamics" in the petition appears to be broader than that in the comments (the term is used in comments 25 and 31 in the context of DO results in the Lamprey River, and in a vague reference to NHDES having "recalculated point source loads . . . accounting for system hydrodynamics", both of which were the subject of detailed responses). EPA understands the reference here to address physical differences between various portions of the estuary, and, it is not accurate to claim that EPA did not evaluate such factors. The record contains analyses separating data by salinity zone, to allow exploration of the systemic differences between portions of the system with different hydrodynamics (RTC at 85); specific discussion of the system hydrodynamics in the Lamprey River (RTC at 94); and analysis of the various factors playing a role in transparency (RTC at 84-85 and 90-92). EPA's conclusion that "natural" conditions are not inconsistent with eelgrass growth is based on EPA's interpretation of available evidence concerning historic presence of eelgrass and sources of turbidity and expected trends in CDOM.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
58	V.a.	Therefore, EPA felt it was appropriate to presume eelgrass loss was caused by changes in nitrogen concentrations in the system. EPA response is clearly deficient.	Fact Sheet at 17, 25 (Ex. 2); RTC at 46; 85 (Ex. 1).	Again, this misstates EPA's position regarding eelgrass loss in the Lamprey River; EPA made no presumption of the cause of eelgrass loss in the Lamprey. EPA's conclusion that there is a causal relationship between nitrogen concentrations and eelgrass loss in Great Bay is discussed in the RTC at 85.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
58	V.a.	First, the detailed DES evaluations referenced by the Coalition confirm that CDOM and turbidity were the factors controlling transparency in this system, not chlorophyll a. (Exhibits 14, 15 providing Deposition Exhibits 31, 32, 73, and 74). The 2012 Burack Letter, referenced by EPA in the Response to Comments at 46, verified this point stating that: "The point of the graphs was to attempt to show that chlorophyll-a was not well correlated with water clarity and therefore, other factors such as turbidity and color dissolved organic matter (CDOM) must be controlling light	RTC at 91-93, 115 (Ex. 1)	EPA notes that the graphs at issue here were ones that were created by the Coalition; Commissioner Burack was pointing out that the Coalition had itself created these graphs in an attempt to show that chlorophyll-a was not well correlated with water clarity. Not coincidentally, the graphs, created by the Coalition to support their argument, <i>appear</i> to support the Coalition's argument. EPA has explained at length the scientific and methodologic flaws underlying those graphs, a technical discussion not addressed by the Coalition in its Petition. Deposition testimony, and the invalid conclusions drawn therefrom, is addressed in <i>Appendix B</i> . In any event, any purported agreement by DES staff in a deposition that these graphs on their face appeared to support a particular conclusion is irrelevant, given the	Mischaracterizes the record, including EPA's responses to comments and other new materials cited, and therefore fails to substantively confront EPA's response, or was irrational in light of the entire record.

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		attenuation. During the deposition, DES staff agreed that the graphs supported those conclusions." Burack 2012 Letter – Attachment at 5.		substantial scientific flaws in the methodology used to create those graphs.	
58	V.a.	Furthermore, the Burack 2012 Letter did not deny the statements made under oath that CDOM and turbidity control transparency in the tidal rivers and that regulating TN will have a negligible impact on transparency in these areas. Id.	Burack letter dated October 19, 2012, attachment at 5 (Ex. 32)	This statement mischaracterized the Burack 2012 letter, which clearly states NHDES's disagreement with these claims of the Coalition. The letter states that CDOM and turbidity are "important factors" but denies that they are "the only factors" controlling transparency; and also states that the claim that regulating TN will have a negligible impact on transparency is predicated on an incorrect assumption.	Mischaracterizes the record, specifically the Burack 2012 letter, and therefore fails to show EPA's action was irrational in light of the entire record.
58	V.a.	Apparently EPA believed even a negligible effect on transparency allowed the Agency to presume that TN was the cause of this condition. An assumption is not the same as having data or analysis supporting a proposition, nor is it a sufficient evidentiary basis to claim a narrative criteria violation exists or that regulation of a particular pollutant will remedy an alleged unacceptable condition in the face of data confirming that is plainly not the case. (Leather Industries of Am. v. EPA, 40 F. 3d. 392 (D.C. Cir 1994).	RTC at 91-93, 115 (Ex. 1)	Again, EPA did not state that chlorophyll-a related transparency impacts were "the cause" of eelgrass loss in the Lamprey River; but that TN control is necessary (even if not by itself sufficient) to allow eelgrass restoration. EPA disagrees that nitrogen has a "negligible" effect on transparency system-wide and has provided a detailed explanation of why the Coalition's analysis purporting to show that the effect is negligible is incorrect. The Coalition's petition fails to address the substance of EPA's response on this issue.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
59	V.a.	The data confirmed that Great Bay estuary, in comparison to other "impaired waters" has very low algal growth. [Figure from Powerpoint Presentation by J. Hall on 2-7-12.]	See Fact sheet at 18-19, 21, 26-28 (Ex. 2); RTC at 43-44, 58, 84, 86-87, 91-92, 102-103, 109-110 (Ex. 1).	This claim was not made in the timely filed comments and therefore was not preserved, although it was reasonably ascertainable. EPA recognizes that the Great Bay Estuary is at an earlier stage of impairment than other systems cited but rejects the argument that efforts to prevent further deterioration should be put on hold until impairments have progressed further and may be irreversible. This is inconsistent with EPA's "protective" and "expeditious" approach to nutrient permitting in estuarine waters. EPA notes that systems with higher phytoplankton growth also have higher eelgrass coverage loss; Narragansett Bay (annual mean chlorophyll-a 38.3 ug/l per chart) has approximately 100 acres of eelgrass remaining out of a historic extent of 8,000-16,000 acres (UBWPAD Memorandum in Opposition at 9); Chesapeake Bay (annual mean chlorophyll-a 9.03 ug/l per chart) experienced loss of 52% of eelgrass coverage between 1993 and 2007 (Orth et al. 2010). This compares to a loss in Great Bay of 17% between 1996 and 2004 and 37% between 1996 and 2008.	Not preserved. At most, it is a bona fide difference of technical opinion that does not demonstrate error on EPA's part, because EPA's decision was rational in light of the entire record.
		Given the low algal growth it is not surprising that, the detailed studies verified that chlorophyll a has a negligible effect on transparency in the system and that Mr. Trowbridge agreed with this under deposition. (Exhibit 15 at 4, 7).	RTC at 91-93, 115 (Ex. 1)	See above. EPA disagrees that nitrogen has a "negligible" effect on transparency system-wide and has provided a detailed explanation of why the Coalition's analysis purporting to show that the effect is negligible is incorrect. The Coalition's petition fails to address the substance of EPA's response on this issue. Mr. Trowbridge's acknowledgement that the Coalition's chart on its face appeared to support the argument that the Coalition constructed it for does not constitute agreement that in fact chlorophyll-a has a negligible effect on transparency. The deposition testimony, and the invalid conclusions drawn therefrom, is addressed in <i>Appendix B</i> .	Lacks specificity necessary for Board review, because the Coalition merely restates its position and does not substantively address EPA's response, which was rational in light of the entire record.
59	V.a.	As algal growth did not respond to DIN changes this verifies that system hydrodynamics and other factors (water column transparency) in fact limiting algal growth in this system. These are the same factors that EPA guidance manuals expressly state must be evaluated to properly determine the influence of nitrogen on algal growth. Nutrient Criteria Technical Guidance Manual for Estuaries and Coastal Waters at 60 3-2 to 3-3;	RTC at 84-85, 90-92 and 94 (Ex. 1).	The Coalition's reference to algal growth and DIN here is unclear. EPA believes the Coalition intends to reference temporal trends in DIN and algal growth at the Great Bay Adams Point monitoring station, as it is the only station where a sufficient record exists showing a long term trend in DIN concentrations (see PREP 2012). It is unclear how this relates to the Coalition's arguments concerning system hydrodynamics, which in its original comments were limited to the tidal rivers. In any case, it is not accurate to claim that EPA did not evaluate such factors. The record contains analyses separating data by salinity zone, to allow exploration of the	Lacks specificity necessary for Board review, because it is unclear. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part, because EPA's decision was rational in

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		Appendix C. [fn 59. EPA is proposing to use location-specific approaches for the derivation of numeric nutrient criteria to ensure that the diversity of unique habitats found in each type of water body are taken into account and addressed. This location-specific approach allowed the Agency to consider individual physical, chemical, and biological characteristics for a particular water body as a whole.]		systemic differences between portions of the system with different hydrodynamics (RTC at 85); specific discussion of the system hydrodynamics in the Lamprey River (RTC at 94); and analysis of the various factors playing a role in transparency (RTC at 84-85 and 90-92).	light of the entire record.
60	V.a.	These are the same factors that EPA evaluated when it proposed the criteria for the state of Florida finding waters subject to low transparency due to turbidity or color naturally entering the system exhibit a far lower algal response to nutrient inputs.	NHDES 2009 Great Bay Nutrient Report at 35 (Ex. 43).	This is a new claim and the Coalition has provided no support for it in its Exhibits. The available evidence indicates that the tidal rivers do not have a reduced algal response to nutrient inputs, given that the tidal river stations are consistent with the overall nitrogen-chlorophyll-a regression line (of tidal stations GRBCL, GRBSQ, GRBLR, GRBOR and NH00049A, three are slightly above the trend line and two below) and the Coalition's own monitoring results indicating nitrogen-fuelled algal blooms in the Squamscott River.	Not preserved, although it was reasonably ascertainable. Lacks specificity necessary for Board review, because it is unsupported. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part, because EPA's decision was rational in light of the entire record.
60	V.a.	EPA's refusal to analyze these same factors that are essential to comprehend whether or how nutrient inputs are effecting algal growth and transparency, in this system, was clear error.	RTC at 84-85, 90-92 and 94 (Ex. 1).	As referenced above, EPA and NHDES did in fact analyze these factors, in some cases performing additional analysis in response to the Coalition's comments. The Coalition's opinion that the EPA and NHDES analyses were insufficient is a technical disagreement that does not constitute clear error.	Mischaracterizes the record, specifically EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
60	V.a.i.	<b>i. The Coalition is not required to demonstrate what caused eelgrass declines that is the responsibility of the regulatory agencies.</b>			
60	V.a.i.	In rejecting the Coalition's comments, EPA asserts the Coalition was somehow responsible for demonstrating what caused the eelgrass loss and refuting EPA's presumption that nitrogen should be assumed to be the factor controlling eelgrass population has no basis in law or fact.	RTC at 45 (Ex. 1)	This is incorrect. In the context of the tidal river, EPA concluded that "Estuarine systems have natural background levels of color and turbidity that are fully compatible with a healthy ecosystem that supports eelgrass habitat"; that natural color was unlikely to have changed over time; and that changes in total solids concentration were not natural, RTC at 45. EPA's comment on the Coalition's failure to provide any information indicating that conclusion was erroneous does not constitute an assertion that the Coalition was responsible for demonstrating what caused eelgrass loss.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
60	V.a.i.	First, it is irrelevant what caused the eelgrass loss in this system 40 plus years ago if existing eelgrass populations cannot be reestablished in this area due to otherwise naturally occurring CDOM or turbidity.	RTC at 45 (Ex. 1)	The premise of this statement is incorrect, as EPA concluded that natural conditions would allow reestablishment of eelgrass based on historic extent and EPA's interpretation of the available information regarding the sources of factors (CDOM and turbidity) impacting transparency. The historical existence of eelgrass in this system logically implies that natural conditions are conducive to eelgrass.	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
60	V.a.i.	Second, it is widely understood that color inputs are rainfall dependent and the Coalition provided the long term rainfall	Petitioner Exhibit 1Y	The Coalition did not offer this information during the public comment period and provides no support for it position now. Color inputs may not rise with rainfall as higher flows provide	Not preserved, although it was reasonably ascertainable.

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		records showing that rainfall after the 1970's dramatically increased compared to conditions occurring from 1930-1960. Exhibit 1Y. This additional rainfall would certainly bring more color into the system and reduce the natural transparency in the system.60 Thus, to the degree it was necessary, the Coalition did provide information explaining what likely changed and caused eelgrass declines in this system. EPA simply ignored that information also.		greater dilution, while total suspended solids are likely to increase in wetter years. Exhibit 1Y contains a chart purportedly of rainfall from 1900s to 2010 with a regression line across it. This chart contains only a long term trend line that does not compare the "1930-1960" period to rainfall "after the 1970's" and that is highly influenced by high rainfalls after 1996; without any reference to the period of time that eelgrass disappeared in the Lamprey River (between 1948 and 1996).	Mischaracterizes/unsupported by the record.
61	V.a.i.	Footnote 60. Natural conditions are not violation of narrative criteria. Env-Wq 1703.14(a) ("unless naturally occurring"). Whether such natural conditions existed in 1940 or are the "new" natural conditions is irrelevant to this regulatory conclusion	RTC at 45 (Ex. 1).	The premise of this statement is incorrect, as EPA concluded that natural conditions would allow reestablishment of eelgrass based on historic extent and EPA's interpretation of the available information regarding the sources of factors (CDOM and turbidity) impacting transparency that indicate that the "new" conditions are not natural. The historical existence of eelgrass in this system logically implies that natural conditions are conducive to eelgrass.	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
61	V.a.ii.	<b>ii. EPA's Rejection of the Tidal River Data Analysis is Baseless</b>			
61	V.a.ii.	The data presented in the tidal river charts showing that transparency was negligibly affected by TN levels was based on the data contained in the DES database for Great Bay Estuary. This was the same dataset that formed the basis for the 2009 Numeric Criteria development.	RTC at 90-92 (Ex. 1)	EPA's criticism of these charts was based on the assumptions used by the Coalition to convert the underlying data to transparency, particularly the false assumption that organic matter produces the same transparency impact as inorganic solids. EPA did not criticize the data itself.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
61	V.a.ii.	It is patently arbitrary for EPA to claim that the same quality-assured data sets used to derive the correlations between transparency and nitrogen by DES cannot be used to do an assessment of how algal growth/nitrogen inputs effects transparency for this individual system. That was clear error.	RTC at 90-92, esp. fn 44 on page 91 (Ex. 1).	This misstates EPA's criticism of the Coalition's analysis. EPA's concern was that incorrect assumptions were used. As noted in footnote 44 on page 91, more accurate assumptions regarding the density and optical properties of organic matter lead to a different result that supports EPA and NHDES's analysis.	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
61	V.a.ii.	It is apparent that the correlation developed by DES in the 2009 Numeric Criteria document cannot possibly tell you what is controlling transparency for the individual tidal river sites contained in the regression. DES simply plotted single long term averages for a given site in the watersheds (Piscataqua, Lamprey, Oyster, etc.) and presumed that different transparency levels found in each location were a direct function of the degree of nitrogen present. No analysis of the data for any individual site was conducted to verify that this assumption was correct.	RTC at 44, 58, 74, 85, 90-93 (Ex. 1).	This does not accurately describe the extensive analysis in the NHDES Great Bay Nutrient Report on the components of transparency and their relationship to nitrogen; EPA agrees that the analysis is based on correlations over the entire Great Bay estuary system, supplemented with analyses dividing the system by salinity zones, RTC at 85, and analysis of individual sites.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
61	V.a.ii.	What is obvious though is that the physical conditions at the various sites differ dramatically and therefore would need to be assessed to determine whether nitrogen control will produce any demonstrable benefits at any particular location.	RTC at 96 (Ex. 1).	EPA has concluded that system-wide analyses are appropriate and that the differing physical conditions have been appropriately addressed; this is a technical disagreement concerning the extent to which grouping of sites is appropriate.	At most, this is a bona fide difference of technical opinion over site grouping that does not demonstrate clear error on EPA's part, because EPA's decision was

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					rational in light of the entire record.
61-62	V.a.ii.	The permit comments and presentations to EPA indicated the following differences were present at the various sites: Major physical difference in sample locations: - Estuary mouth – high dilution, deeper greater currents, low solids, low color, minimal detention time - Bay – Moderated dilution, highest detention time, wind resuspension, eelgrass dominated - Tidal rivers – Lowest dilution, turbulent mixing, stratification, high color, high turbidity These major physical differences dramatically impact ambient transparency and DO, completely unrelated to nutrient inputs . Exhibit 1O and Coalition’s Powerpoint Presentation to EPA, Regional Administrator on February 7, 2012. EPA simply assumed that achieving the nitrogen levels at the mouth of the estuary would produce the same transparency levels if those same nitrogen concentration were to occur in the tidal rivers.	RTC at 6, 45, 85, 90-92, 94-95, 98, 103, 112-115 (Ex. 1).	This is incorrect. While the available information indicates correlations between nitrogen and both chlorophyll-a and the organic component of turbidity, EPA has acknowledged that there are other factors influencing transparency and that in the tidal rivers reductions in total suspended solids, <i>inter alia</i> , are likely necessary to produce adequate transparency levels for eelgrass recovery. Transparency in the tidal rivers is not expected to be the "same" as at the mouth of the estuary even with such reductions; but would be consistent with historic extent of eelgrass. The RTC acknowledges that physical differences between the sites, in addition to nitrogen, impact transparency and DO and concludes that these have been dealt with appropriately. Dilution is addressed on pages 6, 85, 98 and 112; turbidity's impact on ambient transparency is addressed on pages 45, 85, 90-92, 103, 114 and 115; the impact of turbulent mixing is addressed on page 114; color is addressed on pages 113 and 115; and stratification on page 94-95. The Coalition does not address any of these detailed responses but merely restates its original claim that these issues were not addressed by EPA.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review, because the Coalition merely restates its position.
62	V.a.ii.	Putting aside the available data confirmed that this assumption was in error (data which EPA excluded from its assessment and the Response to Comments) there is obviously no information in the record showing that EPA scientific presumption that TN is the only factor naturally changing at all these different locations is are reasonable or appropriate. Absent such information one cannot claim the effluent limitations are necessary to ensure compliance with applicable standards and prevent further narrative criteria violations from occurring. That was clear error on EPA’s part.	RTC at 6, 45, 85, 90-92, 94-95, 98, 103, 112-115 (Ex. 1).	This contains no reference to specific data that "confirmed that this assumption was in error" and EPA is unclear what is being referred to; in any case the "assumption" described was not made. EPA agrees that TN is not the only factor changing at the different locations, but disagrees with the Coalition's conclusions regarding the impact of that fact on the technical analysis.	Mischaracterizes the record. Lacks specificity necessary for Board review, because it is unclear and is unsupported.
62	V.b	<b>b. Great Bay is not a transparency-limited system.</b>			
63	V.b	Well over 90% of the existing eelgrass population in the Great Bay Estuary resides in Great Bay and Little Bay.	PREP Draft Data Report (July 16, 2012) (Ex. 36)	The actual percentage of estuary eelgrass coverage that is in Great Bay and Little Bay is between 85-89% depending on the year; Portsmouth Harbor accounts for close to 10%. Little Bay accounts for 0-2% depending on the year. See PREP 2012 at 127. EPA generally agrees that most of the existing eelgrass population is in Great Bay proper.	
63	V.b	EPA alleges that transparency in Great Bay is insufficient, was the cause of eelgrass declines, and that nitrogen was the critical parameter controlling that specific endpoint.	RTC at 84-85 (Ex. 1)	EPA's position is that current transparency is insufficient, that it is one of the causal factors of eelgrass declines, and that nitrogen is a critical parameter controlling transparency as well as other factors that are contributing to eelgrass declines.	
63	V.b	EPA primarily based its conclusion on the 2009 Numeric Criteria document and the 2010 Peer Review that generally supported the notion that the 2009 Numeric Criteria document was scientifically defensible criteria.	Fact sheet at 12-27 (Ex. 2); RTC at 83-94 (Ex. 1)	EPA's conclusion is based on extensive scientific literature concerning nitrogen related impact to eelgrass communities and estuarine environments; monitoring data from the Lamprey River and the Great Bay Estuary; site-specific studies performed by the NHDES in the 2009 Great Bay Nutrient Report; site-specific data and trend analysis developed by PREP; recommended DIN thresholds in EPA guidance; nitrogen thresholds developed in other states (MA and DE), and 303(d) listing materials.	Mischaracterizes/unsupported by the record.
63	V.b	As noted previously, and admitted by EPA Headquarters and DES under oath, the 2009 Numeric Criteria document was not	Fact sheet at 12-27 (Ex. 2); RTC at 83-94 (Ex. 1)	The Coalition has not provided any references for these supposed "admissions," although EPA is aware that NHDES, unremarkably, stated that correlations alone do not demonstrate	Mischaracterizes the record, including EPA's responses to

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		intended to determine what caused the eelgrass declines in this system.		causation. The deposition testimony, and the invalid conclusions drawn therefrom, is discussed in <i>Appendix B</i> . The NHDES 2009 Great Bay Nutrient Report was not considered in isolation in determining the causal connection between nitrogen and impairments in Great Bay.	comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review, because it is unclear and is unsupported.
63	V.b	Moreover, the pertinent analyses and data that verified TN had not caused these impacts were excluded during the development and peer review of the 2009 Criteria document.	See Burack letter dated October 19, 2012, attachment at 10 (Ex. 32)	There are no analyses and data that "verify TN had not caused these impacts." To the extent the Coalition refers to preliminary analyses, these do not in any way verify a lack of causation. See Burack letter dated October 19, 2012, attachment at 10.	Mischaracterizes the record. Lacks specificity necessary for Board review, because it is unclear and is unsupported.
63	V.b	These two acknowledgements, standing alone, verify reliance on the 2009 Numeric Criteria as "proof" of impairment or the nitrogen levels necessary to meet the narrative standard is pure speculation.	RTC at 83-94.	There are no "acknowledgements" and EPA's reliance on the detailed analysis of extensive site specific datasets set forth in the NHDES 2009 Great Bay Nutrient Report is not "speculation".	Mischaracterizes/unsupported by the record.
63	V.b	Perhaps the single most important scientific error associated with the development of the numeric criteria was that both EPA and DES ignored repeated expert determinations that Great Bay proper is not a transparency limited system because eelgrass are able to get sufficient light over the tidal cycle. (Exhibit 2 at 8).	RTC at 84-85 (Ex. 1)	EPA is unable to determine the relevance of Exhibit 2 at page 8 to this claim. Regardless, EPA does not agree that there have been "repeated expert determinations" that Great Bay proper is not a "transparency limited system" or that this was a specific technical finding as opposed to an informal description. The deposition testimony, and the invalid conclusions drawn therefrom, is addressed in <i>Appendix B</i> . EPA agrees that there is information that Great Bay proper has extensive shallow areas, shallower than the 2 meters used to assess the transparency target for total nitrogen, and that in shallow areas eelgrass receive direct sunlight during low tides that mitigates the impacts of reduced transparency. This has been recognized as an explanation of why eelgrass survives at all in this system. However EPA rejected the Coalition's claim that this indicated nitrogen was not causing eelgrass declines in Great Bay. Declines in both shallow and deeper areas have occurred and are consistent with the array of impacts from nitrogen loads via macroalgae, toxicity effects, and transparency impacts.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review, because it is unclear. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
63	V.b	EPA even acknowledged this point in its response to comments, but failed to understand its importance. The Burack 2012 Letter confirmed this point.(Exhibit 22, attachment at 7).	Burack letter dated October 19, 2012, attachment at 7 (Ex. 32)	There is no citation for this supposed acknowledgement and no such acknowledgement was made. The Burack letter emphasizes that transparency remains important even in shallower portions of Great Bay where the continued existence of eelgrass is dependent on their exposure to direct sunlight during the low tide cycles.	Mischaracterizes/unsupported by the record. Lacks specificity necessary for Board review, because it is unclear.
63	V.b	The Coalition also noted that the peer review was not presented with this specific technical finding applicable to Great Bay and therefore, had no reason to know that the transparency targets believed reasonable to protect eelgrass were essentially irrelevant for Great Bay (the area where the vast majority of eelgrass resides in this system).	RTC at 84-85, 108-09 (Ex. 1)	EPA disagrees that the description "not a transparency limited system" is a "specific technical finding" or that the transparency targets were essentially irrelevant for Great Bay. As demonstrated in the RTC the transparency targets were based on a restoration depth of 2 meters, which is a depth at which eelgrass historically existed in Great Bay. The fact that the majority of beds are at shallower depths and therefore are less impacted by transparency does not render this target irrelevant.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
63	V.b	The failure to recognize the importance of this issue was clear error. If Great Bay is not a water-column transparency limited	RTC at 84-85, 108-09 (Ex. 1); Burack letter dated October	As Coalition's factual description is false, the Coalition's conclusion is incorrect.	Mischaracterizes/unsupported by the record.

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		system it is clear error for EPA to conclude limiting TN to improve water-column transparency is necessary to assure narrative criteria compliance in this part of the system.	19, 2012, attachment at 7 (Ex. 32)		
64		<b>i. There is No Field Data Showing Existing Transparency is Insufficient to Support Eelgrass Growth in Great Bay/Little Bay</b>			
64	V.b.i	Coalition’s comments noted that EPA’s assumption that existing transparency and TN levels were preventing eelgrass recovery ignored data showing eelgrass were rebounding in areas of Great Bay and were reestablishing themselves in Little Bay in waters that did not meet the transparency targets EPA and DES claimed were necessary to allow healthy eelgrass populations to exist (20% incident light at 2 meters). (Exhibit 15- at 8,9; accord eelgrass charts from Burack 2012 letter (Figure 5 showing eelgrass in Great Bay increased from about 1200 to 1650 acres between 2006 and 2011)).	RTC at 4-5; fn 7; 46; 84-85 (Ex. 1)	EPA recognizes that there has been some increase in eelgrass coverage from 2006 to 2011, but that the eelgrass biomass data does not show recovery and was lower in 2011 than in 2006, indicating that this is not sustainable regrowth of healthy eelgrass populations. EPA recognizes that in shallower areas eelgrass may be able to survive in areas where the transparency target based on incident light at 2 meters is not met, and that some limited recovery might occur after a period where nitrogen loads were unusually high due to wet weather. The data indicate however that this increase does not reflect a sustainable recovery, and is consistent with short term variability within the long term declining trend in eelgrass populations and nitrogen loads, and therefore does not undermine the conclusions underlying the permit limit.	Mischaracterizes/ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part, because EPA's decision was rational in light of the entire record.
64	V.b.i	The “late filed” data presented on this issue was in EPA’s possession at the time the draft permit was developed but was excluded from that document. The new information developed by Short showing extensive new eelgrass beds in Little Bay was released in September 2012, after the comment period closed.	Fact sheet at 21-22 (Ex. 2); RTC at 15-16, 46, 88-89 (Ex. 1))	It is not clear what the Coalition means by "late filed" data. EPA was aware of short term fluctuations in eelgrass coverage within the long term trend of decline at the time the draft permit was developed.	Mischaracterizes/unsupported by the record. Lacks specificity necessary for Board review, because it is unclear.
64	V.b.i	EPA’s Response to Comments noted a 37% eelgrass increase in Great Bay since the 2006 downturn, but failed to realize the significance of this fact – eelgrass regrowth is not being prevented by existing water quality conditions related to transparency. (See Short, F.T. 2011. Eelgrass Distribution in the Great Bay Estuary for 2011).	RTC at 4-5; fn 7; 46; 84-85 (Ex. 1)	The RTC does not note a 37% eelgrass increase since the 2006 downturn. The RTC nowhere uses 2006 as a baseline for comparison. The RTC does report the PREP 2009 finding of a 37% DECREASE in eelgrass coverage between 1990 and 2008. (RTC at 4, 88). The RTC does note a recent increase in eelgrass coverage, but attributes that to short term variability within the long term trend. EPA also notes that eelgrass biomass has not shown the same recovery, which tends to indicate that the increase is unlikely to be sustained. Eelgrass biomass in 2011 is in fact the lowest on record and below the previous low in 2006. The Coalition's disagreement with EPA's assessment of the significance of the recent increase does not demonstrate clear error.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
64	V.b.i	In fact, Dr. Morrison reached precisely the same conclusion in 2007. Morrison et al (2008) at 51. EPA itself funded this research.	Morrison, 2008 at 48-49 (Ex. 46); Great Bay Nutrient Report at 56 (Ex. 43).	This is a new claim regarding Dr. Morrison's report. The Morrison Report does state that clarity appears to be sufficient for eelgrass survival in Great Bay, Little Bay and the Lower Piscataqua river (p. 51), based on findings of an average light attenuation factor corresponding to a depth of eelgrass survival of approximately 1.5 meters (p. 48). Morrison et al. concluded that this level of transparency permitted eelgrass survival since it was greater than the 1 meter minimum depth for eelgrass (p.49). The approach taken by NHDES differs in that it is based on an eelgrass maximum depth of 2 meters, therefore requiring higher clarity than assumed by Morrison et al. (Great Bay Nutrient Report at 56) EPA agrees with the NHDES approach. A 1.5 meter depth is too shallow to be fully protective in Great Bay proper, while the two meter depth used by NHDES is consistent with the actual depths of historic eelgrass beds in Great Bay	No preserved although it was reasonably ascertainable. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part, because EPA's decision was rational in light of the entire record.

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				proper (RTC at 14), and is consistent with the loss of eelgrass in this assessment zone (Great Bay Nutrient Report at 56). Additionally, while the Morrison report states that water clarity is sufficient for eelgrass survival in Great Bay, Little Bay, and the Lower Piscataqua River the water clarity in the remainder of the estuary is too poor to support eelgrass, which is demonstrated by the disappearance of eelgrass from the tidal rivers (Squamscott, Lamprey, and Oyster) and the Upper Piscataqua River. Finally, the Morrison report only looks at water column clarity to determine where or not eelgrass could exist. It fails to address the light blocking impacts of macroalgae and epiphytic growth, both of which have been increasing within the Great Bay Estuary.	
64	V.b.i	Short's 2011 assessment confirmed that 48 acres of eelgrass have now regrown in Little Bay; a level of eelgrass higher than that occurring in 1996 when eelgrass resources in Great Bay was considered unimpaired. (See Deposition Exhibit 56- 2009 Section 303 impaired waters list).	RTC at 4 (Ex. 1); PREP Draft Data Report (July 16, 2012) at 127-28 (Ex. 36); NHDES 2009 Great Bay Nutrient Report at 56 (Ex. 43).	There has been reappearance of eelgrass in Little Bay (RTC at 6). This particular eelgrass bed has been particularly susceptible to fluctuation since 1996. PREP 2012 at 127-28. This is consistent with NHDES' description of marginal transparency conditions in Little Bay in the Great Bay Nutrient Report at 56 ("the Zmax is below (less than) the Zmin but the difference is less than 1 meter. This is consistent with observations that eelgrass in these areas is either declining or has recently disappeared").	Ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Bona fide difference of technical opinion regarding the implications of recent increases in eelgrass coverage.
64	V.b.i	This confirms that a less restrictive transparency and nitrogen level would support eelgrass reestablishment. Likewise this data confirmed that there was no toxicity problem impacting the system, precluding eelgrass regrowth, as EPA has implied is occurring.	RTC at 15-16; 73; 83 (Ex. 1); id. at 5 fn 7; Burack letter dated October 19, 2012, attachment at 8-9; (Ex. 32).	This is short term variability in eelgrass coverage within the long term trend of decline. The continued decline of eelgrass biomass further indicates that these data do not indicate sustained recovery.	Ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Bona fide difference of technical opinion regarding the implications of recent increases in eelgrass coverage.
65		<b>ii. The Data does not show transparency-induced eelgrass losses in Great Bay</b>			
65	V.b.ii	Finally, the Coalition presented information (again that was previously in EPA's possession but not included in the 2009 Numeric Criteria Document) showing that there was never a significant change in transparency despite changing TN levels in the system and therefore, it is apparent that any loss of eelgrass, long-term or otherwise, could not be attributed to a factor (transparency) that never changed. (Exhibit 1H).	RTC at 58 and 109 (Ex. 1). PREP 2009 State of the Estuaries Report at 13 (Ex. 19); PREP Draft Data Report (July 16, 2012) (Ex. 36)	The data in Exhibit 1H does not show that there was never a significant change in transparency. The secchi disk data collected by volunteers at Adams Point was not considered reliable by NHDES, and EPA concurs with that conclusion. (RTC at 109). Chlorophyll-a through 2009 (the other portion of the Exhibit) was determined by NHDES to indicate an increasing trend through 2009 (RTC at 58), although more recent data indicates a leveling off of chlorophyll-a. Suspended sediment, another component related to transparency, has consistently shown upward trends and the particulate organic matter component of suspended sediment has been shown by NHDES to be related to nitrogen concentrations.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
65	V.b.ii	In fact, DES made a specific presentation to EPA Region I on this issue in March 2008, confirming transparency levels in the system had never declined prior to developing the 2009 Numeric Criteria document. (Exhibit 2 at 3).		Exhibit 2 at 3 does not contain this statement and EPA has been unable to locate such a statement in the attached materials.	Mischaracterizes/unsupported by the record. Lacks specificity necessary for Board review, because it is unclear.

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65	V.b.ii	In response, EPA largely ignored every one of these observations that were separately verified by Commissioner Burack’s letter which EPA chose to include in the record.	RTC at 58 and 109 (Ex. 1). PREP, 2009a at 13 (Ex 19); PREP Draft Data Report (July 16, 2012) (Ex. 36)	EPA responded to each of the observations at issue as indicated above.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
65	V.b.ii	EPA did acknowledge that Great Bay is not a transparency limited system <sup>62</sup> but raised the new claim that precluding eelgrass impairments in Great Bay, nonetheless requires increased transparency level to be met at 2 meters and implying that eelgrass losses primarily occurred in these deeper waters. [FN 62 EPA’s response is schizophrenic. In one section EPA admits Great Bay is not transparency limited, in another section EPA claims the data confirm transparency and eelgrass declines in Great Bay are closely related – showing a picture that on its face supports no such conclusion.(RTC at 109-110) ]	RTC at 108-09; Great Bay Nutrient Report at 56 (Ex. 43).	EPA has never stated that "Great Bay is not a transparency limited system." EPA has acknowledged that eelgrass in shallow areas receives light over the tidal cycle but has consistently stated that water clarity remains important in these areas in addition to other nitrogen impacts. The transparency target at 2 meters is a fundamental aspect of the 2009 NHDES Great Bay Nutrient Report and is not new. Great Bay Nutrient Report at 56. EPA has never stated that eelgrass losses primarily occurred in deeper waters, but that the loss of eelgrass in the deepest portions of Great Bay proper where eelgrass previously existed indicate that the Coalition's claim that "eelgrass is healthiest in deeper waters" is untrue.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
66	V.b.ii	A. The graph presented by EPA to imply eelgrass losses in Great Bay occurred in primarily deeper waters (first presented in this Response to Comments) on its face does not show this to be correct. (See RTC at 110). The figure shows vast majority of eelgrass declines that occurred in 2006/2007 occurred in shallow waters that otherwise received sufficient light over the tidal cycle which was confirmed in the Morrison 2007 Study.	RTC at 108-09 (Ex. 1)	EPA included a bathymetry map in the RTC to allow evaluation of the Coalition's claim that "eelgrass is healthiest in deeper waters." As stated in the RTC, in addition to eelgrass losses in shallower waters closer to the tidal river inputs (where TN concentrations are highest) and macroalgae-impacted areas, the deeper (>1.5 m) portions of the bay to the east of the main channel and south of the main channel split have had significant eelgrass loss, consistent with transparency impacts in these areas.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
66	V.b.ii	Morrison confirmed that “[t]hese results suggest that the water clarity in Great Bay, Little Bay and Lower Piscataqua River was sufficient for the growth of eelgrass. The virtual absence of eelgrass from all but Great Bay suggests that other processes apart from light restricted growth are important for limiting eelgrass survival.” (Morrison at 51).	Morrison, 2008 at 48-49 (Ex. 46)	As stated above, this is a new claim regarding Dr. Morrison's report. The Morrison Report does state that clarity appears to be sufficient for eelgrass survival in Great Bay, Little Bay and the Lower Piscataqua River (p. 51), based on findings of an average light attenuation factor corresponding to a depth of eelgrass survival of approximately 1.5 meters (p. 48). Morrison et al. concluded that this level of transparency permitted eelgrass survival since it was greater than the 1 meter minimum depth for eelgrass (p.49). The approach taken by NHDES differs in that it is based on an eelgrass maximum depth of 2 meters, therefore requiring higher clarity than assumed by Morrison et al. (Great Bay Nutrient Report at 56) EPA agrees with the NHDES approach. A 1.5 meter depth is too shallow to be fully protective in Great Bay proper, while the two meter depth used by NHDES is consistent with the actual depths of historic eelgrass beds in Great Bay proper (RTC at 14), and is consistent with the loss of eelgrass in this assessment zone (Great Bay Nutrient Report at 56). Additionally, while the Morrison report states that water clarity is sufficient for eelgrass survival in Great Bay proper, Little Bay, and the Lower Piscataqua River the water clarity in the remainder of the estuary is too poor to support eelgrass which is demonstrated by the disappearance of eelgrass from the tidal rivers (Squamscott, Lamprey, and Oyster) and the Upper Piscataqua River. Finally, the Morrison report only looks at water column clarity to determine where or not eelgrass could exist. It fails to address the light blocking impacts of macroalgae and epiphytic growth, both of which have been increasing within the Great Bay Estuary.	Not preserved although it was reasonably ascertainable. Ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's position, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
66	V.b.ii	B. Other than simply stating that the graph provides this	RTC at 108-09 (Ex. 1).	The RTC points out the areas of the bathymetry map that are deeper and that correspond to	Mischaracterizes the record,

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		demonstration, EPA provides no substantive explanation of how this figure does so. Absent such specific information this is just an unsupported, conclusory opinion (that is demonstrably incorrect from examining the figure itself).		eelgrass loss, to the east of the main channel and south of the channel split. The Coalition has not responded to this explanation.	including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
66	V.b.ii	C. EPA fails to mention that in comparison to 2007 present eelgrass populations rebounded several hundred acres in Great Bay despite "inadequate transparency" and are now at the threshold where Great Bay would not be considered eelgrass impaired using the DES Section 303(d) listing criteria. As stated in the 2008 Section 303(d) list, an average healthy eelgrass population in this part of the system is 2,100 acres +/- 20%. (Deposition Exhibit 19 at 19). The present eelgrass population is barely below the lower threshold averaging 1,650 acres versus 1,680 acres, the non-impairment threshold. Given this information there is no credible basis for EPA to claim that restoring the system to non-impaired status requires additional acres of eelgrass to be obtain in deeper waters as opposed to prevalent shallower waters where historic eelgrass declines have generally occurred.	NHDES 2012 303(d) List Technical Support Document (Ex.45) ; PREP Draft Data Report (July 16, 2012) (Ex. 36). Deposition Exhibit 19 does not appear to be included in Coalition's record but is in the Administrative Record (Ex. 44).	This is a new claim and is untrue. Current eelgrass conditions in Great Bay are considered impaired using the NHDES Section 303(d) assessment and listing methodology. The NHDES assessment for the 2012 303(d) list states: "Eelgrass habitat has continued to decline in the Great Bay Estuary. In the Great Bay itself, both eelgrass cover and eelgrass biomass are in decline (Figure 3). The current (2010) extent of eelgrass cover in Great Bay is 1,722.2 acres and the median extent in 2008-2010 was 1,700.6 acres, which is a -20.2% change from its historical extent of 2,130.7 acres. There has been a steeper trend (-54%) in eelgrass biomass loss because of thinning of the eelgrass beds. Significant eelgrass loss was evident in all areas where eelgrass has been mapped (Table 3)." The 2011 eelgrass cover figure of 1,623.2 acres (PREP, 2012) is lower than the 2008-10 coverage that was used in the NHDES assessment.	Not preserved although it was reasonably ascertainable. Mischaracterizes the record.
67	V.b.ii	D. The Burack 2012 Letter cited by EPA in its Response to Comments, expressly acknowledged that (1) algal levels had not changed in the system for 30 years despite changing nitrogen levels, and (2) Great Bay is not a transparency limited system.	Burack letter dated October 19, 2012, attachment at 1, 7 (Ex. 32).	The Burack letter does not "acknowledge" these misleading oversimplifications of the system, but rather corrects and clarifies these points. With respect to algal levels the letter (i) clarifies that macroalgae is also a form of algae and has clearly changed so that the statement on its face is incorrect; (ii) acknowledges that "there had been no clear trends in chlorophyll-a (a specific measurement of phytoplankton) measured in Great Bay over the full period of record (1974-2011) in Great Bay". Burack letter attachment at 1. With respect to the claim that Great Bay is not a transparency limited system the letter clarifies that while "one of the reasons eelgrass still exists in Great Bay proper is the exposure of eelgrass plants to direct sunlight at low tide", that "water clarity is still important even in shallow areas" and that "the claim that Great Bay proper is not transparency limited does not mean that nitrogen does not effect eelgrass in Great Bay proper." Id. at 7. The letter also notes that light attenuation is also associated with non-phytoplankton organic matter that is related to nitrogen inputs. Id. at 3.	Mischaracterizes the record.
67	V.b.ii	Although both EPA and DES have admitted that Great Bay is not a transparency limited system, both continue to rely on a set of technical analyses and related flawed peer review premised on the opposite conclusion. EPA's determination to forge on to impose stringent nitrogen controls to improve transparency, in a non-transparency limited system, is clear error.	RTC at 108-09 (Ex. 1).	EPA has never stated that "Great Bay is not a transparency limited system." EPA has acknowledged that eelgrass in shallow areas receives light over the tidal cycle but has consistently stated that water clarity remains important in these areas in addition to other nitrogen impacts. The transparency target at 2 meters is a fundamental aspect of the 2009 NHDES Great Bay Nutrient Report and is not new. Great Bay Nutrient Report at 56. EPA has never stated that eelgrass losses primarily occurred in deeper waters, but that the loss of eelgrass in the deepest portions of Great Bay proper where eelgrass previously existed indicate that the Coalition's claim that "eelgrass is healthiest in deeper waters" is untrue.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
67	V.c.	<b>c. Great Bay is not confirmed to be a macroalgae impaired system.</b>			
67	V.c.	In response to the Coalition's comments that TN-induced	Fact sheet at 11, 13, 14, 18,	It is not clear why the Coalition described the Fact Sheet as including information "in response	Mischaracterizes the record.

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		transparency is not causing eelgrass impairment, the draft permit Fact Sheet mentioned but had little discussion of macroalgae impairments alleged to exist in Great Bay. <sup>63</sup>	19, 20, 22 (Ex. 2)	to the Coalition's comments." The Coalition's comments were filed subsequent to publication of the Fact Sheet and the Fact Sheet was not written in response to any Coalition comments. In any case, the Fact Sheet consistently includes macroalgae in its discussion of nitrogen-related eutrophication impacts.	
67	V.c.	Footnote 63. The Fact Sheet only references macroalgae four times. (Fact Sheet at 13, 18, 20, 22.). Epiphytes are a form of macroalgae that grows directly on the eelgrass leaves.	Fact sheet at 11, 13, 14, 18, 19, 20, 22 (Ex. 2)	This is incorrect. In addition to five uses of the word "macroalgae" on the four pages cited by the Coalition, the Fact Sheet uses the variations "macro algae" (page 11) and "macro-algae" (page 19) and discusses "epiphytes" and "epiphytic growth" on page 14. Indeed a brief review indicates that nearly every use of the term "phytoplankton" in the Fact Sheet is accompanied by a reference to macroalgae.	Mischaracterizes the record.
67	V.c.	It should be noted that the 2009 Numeric Criteria document only had two pages devoted to discussing possible macroalgae impairment <sup>64</sup> and DES concluded that based on the limited data available a significantly less restrictive nitrogen level up to 0.38 mg/L TN could be sufficient to prevent excessive macroalgae growth in the system. (2009 Numeric Criteria at 28).	NHDES 2009 Great Bay Nutrient Report at 28 (Ex. 43).	This is not entirely correct, as the two sections on macroalgae in the 2009 Great Bay Nutrient Report span five pages (10-11 and 37-39), and stated that "total nitrogen concentrations should be less than 0.34-0.38 mg N/L to prevent replacement of eelgrass by macroalgae in Great Bay." Id. at 38. Macroalgae impacts are only one line of evidence supporting the total nitrogen target.	Mischaracterizes the record.
68	V.c.	Concurrently, Dr. Short informed EPA he was not finding a significant macroalgae or epiphyte impairment in the system and that eelgrass were not being smothered by macroalgae growth. (See, Exhibit 22 and EPA Phone logs with Dr. Short).	EPA Phone logs (Ex. 47; Ex. 48); see Petitioner Exhibit 22 at 3 and 7 (characterizing deposition testimony) as compared to Petitioner Exhibit 12, Short Depo. At 45-46 (actual deposition testimony)	Dr. Short did no such thing. The statement mischaracterizes the EPA phone logs. Those logs state: "Fred informed me that the issue with Great Bay proper is mostly macro algae. Because the eelgrass beds in this portion of the estuary are intertidal (i.e. exposed at low tide) the plants are able to receive a significant amount of light during low tides. However, he did say that light attenuation is still an issue in this area because during high tide the plants are not getting enough light due to high light attenuation coefficients in the water column. In other portions of the estuary the eelgrass beds are subtidal (i.e. submerged during all phases of the tide) and light attenuation is a major issue in these areas." (Phone log 11-14-11) and "With respect to epiphytes, Fred told me that epiphytic growth has historically not been an issue in Great Bay because this growth seemed to be controlled by grazers. However, this year he has noted an increase in the amount of epiphytic growth in Great Bay proper." (Phone log 11-18-11). Exhibit 22, on the other hand, contains only the Coalition's assertions regarding statements of Dr. Short and no evidence that Dr. Short "informed EPA" as the Coalition asserts; indeed the deposition of Dr. Short (attachment to Exhibit 12) contains a number of statements by Dr. Short that macroalgae were in fact overgrowing eelgrass beds. (Short Depo. at 45-46). The Deposition testimony, and invalid conclusion drawn therefrom, are discussed in <i>Appendix B</i> .	Mischaracterizes the record.
68	V.c.	Moreover, Short found that locations where eelgrass had previously existed now had macroalgae growing in them after eelgrass declined rapidly in 2006.		This statement is unreferenced and EPA cannot ascertain its accuracy without some citation, although it is likely the case that macroalgae is growing in areas where eelgrass previously existed.	Lacks specificity necessary for Board review, because it is unclear.
68	V.c.	Thus it was not apparent that (1) macroalgae caused any eelgrass declines or (2) that the new presence of macroalgae in certain areas would preclude eelgrass restoration in the future (macroalgae growth being transient).	RTC at 44 (Ex. 1).	The basis for this conclusion consists of mischaracterized and misstated documents as noted above. The impact of macroalgae on eelgrass is described in the RTC.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
68	V.c.	In any event, the Coalition noted that following the macroalgae increase of 2007/2008, eelgrass populations rebounded by about	Petitioner Exhibit 15 at 9; Petitioner Exhibit 12	The Coalition is citing its own Supplemental Comment, which itself mischaracterizes the deposition testimony. The deposition testimony, and the invalid conclusions drawn therefrom,	Mischaracterizes the record.

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		40% and DES confirmed that there was no information showing that macroalgae were significantly preventing eelgrass regrowth in the system. (Exhibit 15 at 9).	attachment, Trowbridge Deposition at 104-105 and 156-57	is addressed in <i>Appendix B</i> . While the Supplemental Comment claims that "Mr. Trowbridge did not oppose Dr. Short's findings that current macroalgae growth has not been demonstrated to prevent eelgrass restoration anywhere in Great Bay", in fact the Short statement Mr. Trowbridge was asked about was as follows: "since we have not found any areas of nuisance macroalgae overgrowing eelgrass beds as we have documented in areas like Waquoit Bay, Massachusetts, for example, the results of our analysis are only applicable where nuisance macroalgae has proliferated to the extent to prevent the reestablishment of eelgrass from seed." Thus Dr. Short's statement explicitly contemplates the existence of areas where macroalgae prevents reestablishment of eelgrass, and Mr. Trowbridge's acquiescence to the statement ("A. I don't know. I mean, I don't know what we was thinking when he wrote this." . . . Q. Again, any reason to believe that that's an inaccurate statement from Dr. Short?. A. No.") does not constitute the "confirmation" the Coalition claims. Mr. Trowbridge also agreed that there was an increase in eelgrass coverage in Great Bay between 2007 and 2010 and that this increase was not prevented by macroalgae. This is not a blanket statement that macroalgae has no impact on eelgrass regrowth. EPA notes that eelgrass in Great Bay declined 100 acres from 2010-11, and that while coverage increased between 2007 and 2010 there have been further declines in eelgrass biomass in that period, indicating that there is no sustainable recovery.	
68	V.c.	Following the issuance of the draft permit and the close of the comment period, both EPA and DES participated in meetings with the permittees in Great Bay indicating that macroalgae growth was now the primary concern in the system, not transparency. (See, e.g. Exhibit 22 slides from Exeter permit meeting Sept-2012).	RTC at 45-46 (Ex. 1)	EPA disagrees with the Coalition's characterization of these meetings. The position of EPA and NHDES has consistently been that macroalgae is one of the concerns in Great Bay, and a significant one in shallower areas, but that transparency remains a major concern and is appropriately a basis for permit limits in Great Bay. RTC at 45-46. The existence of two out of eight slides regarding macroalgae at a single meeting does not indicate that macroalgae had become "the primary concern."	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
68	V.c.	This position was also reflected throughout the Burack 2012 Letter which repeatedly claimed the main issue effecting eelgrass in the system was macroalgae. (See Burack 2012 Letter at 1 and 7).	Burack letter dated October 19, 2012, attachment at 1 and 7 (Ex. 32).	This statement mischaracterizes the Burack letter. Neither the Burack letter nor the attachment states that macroalgae is the "main" issue or any equivalent term. Page 1 of the attachment discusses macroalgae in the context of a claim that "algal levels in the system did not change materially . . .". The letter corrects that claim to note macroalgae is a form of algae and has clearly changed, and notes that "[f]or shallow systems, it is expected that changes in macroalgae will precede changes in phytoplankton (McGlathery et al., 2007; Valiela et al., 1997), which is what is actually happening in Great Bay." Page 7 of the attachment notes that the mechanism by which nitrogen affects eelgrass is different in different parts of the Great Bay Estuary, with macroalgae a more immediate cause of losses in shallower areas. The letter confirms the importance of light attenuation as the immediate issue in the deeper areas of the estuary and as an "important contributing factor" in shallower areas.	Mischaracterizes the record.
68	V.c.	It should be noted that the 2009 Numeric Criteria Document itself indicated that the only location where macroalgae was considered to be a possible threat was in Great Bay proper, not in any of the tidal rivers, due to Great Bay proper having habitat which promotes macroalgae growth while the tidal rivers do not. (See 2009 Numeric Criteria at 38).	NHDES 2009 Great Bay Nutrient Report at 38 (Ex. 43).	This statement misstates the content of the 2009 Great Bay Nutrient Report. What the Report says at page 38 is "With the available data, it is not clear whether this same threshold would be applicable to other sections of the estuary besides Great Bay."	Mischaracterizes the record.
68	V.c.	Because EPA and DES appeared to be using new information supporting the new rationale that Great Bay is a macroalgae	RTC at 43-46 (Ex. 1); Fact sheet at 11, 13, 14, 18, 19,	EPA's position has remained constant, that macroalgae is a significant issue but that transparency is also a primary concern. The Coalition's Comments on the Draft Permit took	This entire claim was not preserved. The Coalition made

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		limited system, the Coalition submitted supplemental comments noting the lack of technical basis for asserting that macroalgae levels were either (1) causing ecological impairment in the system or (2) presently limiting eelgrass regrowth in the system. (See Supplemental Comments submitted on October 18, 2012, November 4, 2012, and November 8, 2012).	20, 22 (Ex. 2); RTC at 55 (Ex. 1).	the opposite position from that in the petition, stating "the following technical conclusions have been drawn: . . . b. Macroalgae growth has significantly increased in the Great Bay over the past two decades, and this condition is adversely impacting habitat and eelgrass populations (confirmed by Art Mathieson) (Note: Such excessive macroalgae growth has not been documented in any of the Bay's tidal rivers or tied to any decline in eelgrasses in those areas.)" The Comments further argued, "The focus for the Bay restoration should be changed to macroalgae and DIN. Thus, EPA's reliance on Section 303(d) lists should be revised to indicate that the designated cause of eelgrass declines in the Bay is excessive macroalgae growth and increased DIN loadings."	the opposite argument in its timely filed comments. The Coalition's attempt to characterize this as a "new" claim by EPA in order to justify changing its argument on this issue is incorrect and based on mischaracterization of the record. Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
69	V.c.	Significant technical data and information confirming these positions was provided to EPA including deposition testimony from Short (leading macroalgae expert) and Trowbridge (DES).	Trowbridge deposition at 377-79 (Petitioner Exhibit 12)	The deposition testimony is inaccurately characterized in the supplemental comments and does not confirm the position of the Coalition. The deposition testimony, and the invalid conclusions drawn therefrom, are discussed in <i>Appendix B</i> . Mr. Trowbridge's statements regarding whether macroalgae had been "proven" to cause eelgrass decline is the result of a semantic debate with the deposing attorney as to the level of certainty needed, with Trowbridge ultimately stating "if the burden of proof is to prove causation, since we do not have a control Great Bay where we can run an experiment with or without macroalgae or with our without nitrogen, we don't have that information." Trowbridge deposition at 377-79 (Exhibit 11). The inability to run a controlled experiment on a body of water such as Great Bay is already well understood and does not undermine the technical basis for the permit. Dr. Short's deposition does not appear to confirm any of the Coalition's claims.	Mischaracterizes the record.
69	V.c.	Consistent with the new position outlined in the Burack 2012 Letter, EPA's Response to Comments also repeatedly alleges that macroalgae are documented at a level causing impairment and they are preventing eelgrass regrowth in the system. (See RTC at 109).	RTC at 109 (Ex. 1)	The language cited from the RTC at 109 was not EPA's assertion but agreement, to a limited extent, with a statement made in a Coalition comment. The Coalition comment states:  "In contrast to the transparency theory of eelgrass loss, higher losses appear to have occurred in shallower environments where the most light is available, and eelgrass are healthiest in the deeper waters. (See Figure HAB2-2, 2009 PREP Report.) <i>This could evidence that macroalgae or shoreline development are adversely impacting eelgrass populations.</i> Therefore, mandating TN reduction because of an assumed connection between eelgrass loss and transparency was in error." (RTC at 108).  In response, EPA stated: "EPA agrees that macroalgae and shoreline conditions may also impact eelgrass decline, but notes that this does not disprove the established relationship between eelgrass and transparency." (RTC at 109). EPA continues to agree with the position expressed by the Coalition during the comment period that macroalgae are a significant issue in Great Bay proper, although transparency remains one of the concerns.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
69	V.c.	Moreover, there is no data or analysis in the record showing that macroalgae or epiphytes (another form of attached algal) is significantly impairing eelgrass populations or system biology. Documents in EPA's possession from Dr. Short repeatedly	RTC at 44, 55, 58, 109, 155-56 (Ex. 1).	Data and analysis showing the impacts of macroalgae and epiphytes are described in the EPA Responses on pages 44, 58 and 109 of the RTC as well as the Coalition's comments at pages 55 and 155-56. The Coalition itself stated that macroalgae was the cause of impairments and argued for restating the cause of impairment in terms of macroalgae, in its timely filed	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's

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		informed the agency that epiphytes were not a cause for concern in this system. (See phone logs cited in EPA Response to Comments.)		comments. This statement misstates the contents of the phone logs.	response, which was rational in light of the entire record.
,69	V.c.	Despite this, EPA repeatedly claims that epiphytes are some sort of generic concern that warrants extreme nitrogen reduction requirements to be implemented by Coalition communities.	RTC at 46 (Ex. 1)	This mischaracterizes the evidence of epiphyte concern, which is based in part on "recently documented evidence of extensive epiphyte growth (Short, 2011; Mathieson, 2012)," not generic concerns.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
69	V.c.	DES admitted under oath that it has no information showing the degree of impact, ecological or otherwise, for macroalgae in the system. (Exhibit 15 at 9). DES also admitted that eelgrass populations rebounded since the 2006-2007 decline in areas where macroalgae have previously grown, confirming that macroalgae growth is not precluding eelgrass repopulation in the system. Id.	Petitioner Exhibit 15 at 9; Petitioner Exhibit 12, Trowbridge Deposition at 104-105, 156-57, 377-79; Burack letter dated October 19, 2012, attachment at 8 (Ex. 32).	The deposition testimony is inaccurately characterized in the supplemental comments and does not confirm the position of the Coalition, as discussed above. NHDES has specifically stated that eelgrass is "not 'rebounding'" and that the short term variability lies within a significant long term downward trend. Burack letter attachment at 8.	Mischaracterizes the record.
70	V.c.	Likewise the data for Little Bay confirming 48 new acres of eelgrass beds now exist is proof positive that eelgrass regrowth is not being precluded by alleged macroalgae impacts. EPA's use of unsupported speculation to justify claims of narrative criteria violations and the need for stringent TN reduction was clear error.	RTC at 16 (Ex. 1)	It is not clear that the new eelgrass beds in Little Bay will be sustained in the long term; note that the 48 acre increase in Little Bay coincided with a decrease of 99 acres in Great Bay (PREP 2012 at 127) and that eelgrass biomass continues to decline and is at the lowest level ever recorded (PREP 2012 at 234). To the extent the Coalition believes that any seeding and recolonization by eelgrass would immediately be prevented by macroalgae impacts, this is a misunderstanding of the system - macroalgae are generally free-floating and may shift location, and epiphyte impacts will not occur until eelgrass shoots are established.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
70	V.c.i	<b>i. EPA's Presentation of Nettleton's Report is Misleading and Not Current</b>			
70	V.c.i	EPA cites to a report done by Nettleton (2011) as proof of macroalgae impact on eelgrass. First, EPA fails to acknowledge that the Nettleton analysis was done in areas where eelgrass do not and cannot grow – in the tidal flats exposed during low tide. (Exhibit 22). Thus, this report has no relevance to eelgrass impact whatsoever.	Nettleton, 2011 (Ex. 49); NHDES 2009 Great Bay Nutrient Report, Figure 18 (Ex. 43).	There is no basis for the claim that the Nettleton analysis was done in areas where eelgrass do not and cannot grow. While the study sites were in intertidal areas, eelgrass does grow in intertidal areas at this latitude and two of the three Great Bay sampling sites (Sunset Farm and Depot Road) were in locations where eelgrass has historically grown (see Great Bay Nutrient Report, Figure 18). More importantly, the specific location of macroalgae blooms at any given time is less important than the frequency and total biomass of blooms since much of the nuisance algae that we are concerned about is drift or free-floating species. Their distribution can be shifted by storms or persistent winds.	Mischaracterizes/unsupported by the record.
70	V.c.i	Moreover, the data provided by the Coalition (and ignored by EPA) confirmed that current macroalgae growth in areas investigated by Nettleton in 2008 showed dramatically reduced macroalgae growth in 2012. (See Exhibit 20 --- below is one comparison of macroalgae growth at the same site in 2008 and 2012).	Petitioner Exhibit 20	Most of the pictures provided are of such poor quality that it is difficult to discern any useful information from them. Several of the photos show salt marsh and intertidal mudflats. The last photograph does seem to show some collection of algal material on the intertidal flats but from the quality of the photo, it is impossible to make out a species. As discussed above, much of the nuisance algae that we are concerned about is drift or are free-floating species and their distribution can be shifted by storms or persistent winds. Thus, the lack of algae in one location at one point in time is not necessarily significant.	Unsupported by the record/unsubstantiated assertion; mere speculation.

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70	V.c.i	EPA's repeated refusal to consider the updated information regarding the extent of macroalgae growth and its actual impact on eelgrass ecology in this system is clear error. Relying on generalized claims that macroalgae "can" or "may" cause impairment to eelgrass (RTC at 109) is not evidence that such impairments actually occurred in this system, violating narrative standards.	RTC at 32, 44 (Ex. 1); PREP Draft Data Report (July 16, 2012) at 16 (Ex. 36).	EPA specifically considered updated information regarding eelgrass growth, citing Nettleton, 2011; Short, 2011; Mathieson, 2012. RTC at 44. The PREP 2013 State of the Estuaries Report is consistent with these sources, stating that "Great increases in both mean and peak Ulva and Gracilaria biomass and percent cover have occurred in the Great Bay Estuarine System." PREP, 2012a at 16. The Coalition's Comments on the Draft Permit made the opposite argument, stating "the following technical conclusions have been drawn: . . .b. Macroalgae growth has significantly increased in the Great Bay over the past two decades, and this condition is adversely impacting habitat and eelgrass populations (confirmed by Art Mathieson) (Note: Such excessive macroalgae growth has not been documented in any of the Bay's tidal rivers or tied to any decline in eelgrasses in those areas.)" The Comments further argued, "The focus for the Bay restoration should be changed to macroalgae and DIN. Thus, EPA's reliance on Section 303(d) lists should be revised to indicate that the designated cause of eelgrass declines in the Bay is excessive macroalgae growth and increased DIN loadings."	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
71	V.c.i	DES admitted under oath that such impairments have never been demonstrated.(Exhibit 15 at 9). <sup>65</sup>		This statement mischaracterizes the deposition testimony, as does Exhibit 15 (a document written by the Coalition). The deposition testimony, and invalid conclusions drawn therefrom, are addressed in <i>Appendix B</i> .	Mischaracterizes the record.
71	V.c.i	Footnote 65. EPA also relied on a comment submitted by Dr. Viella for CLF to claim macroalgae impacts are occurring. A thorough review of that document will demonstrate that it is not based on any analysis of data from the Great Bay system.	RTC at 12 (Ex. 1). Valiela and Kinney Review at 1 (Ex. 29).	This statement is incorrect. The Valiela and Kinney (2011) cited by EPA at page 12 at the RTC states that it is based on the authors' review of a wide range of documents pertaining to Great Bay. However EPA has not relied on Dr. Valiela's comments as direct evidence of the existence of macroalgae impacts.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
71	V.c.i	It should be noted that the macroalgae issue was raised in the MOA group meetings with various University of New Hampshire professors knowledgeable of the conditions in the system. It was Dr. Mathieson's position that macroalgae had increased and was at a level that raised some concern.	Petitioner Exhibit 1U at 4.	The phrase "at a level that raised some concern" was not used by Dr. Mathieson in these notes and does not accurately convey his statements as reflected in this document, i.e.: "System as a whole is impacted by green tides. There is massive amounts of material which can be taken as indicators of eutrophication . . . There are now massive greens and reds moving in. . . . No question there is a seaweed/nutrient problem in GB."	Mischaracterizes the record.
71	V.c.i	However, because it was unknown whether or not nutrient control would be effective as a number of the species now found were invasive and he recommended that detailed research was need to determine whether nitrogen reductions could limit macroalgae growth. (Exhibit 1U – MOA Meeting minutes Sept 2011).	Petitioner Exhibit 1U at 4-5.	This misstates the notes concerning Dr. Mathieson's statement. The exact quote is: "Ammonia and nitrate are the primary nitrogen forms stimulating plant growth. The appropriate allowable level of DIN to control macroalgae in the estuary is not known at this time; but it is currently too high now and reduction needs to begin sooner than later." Dr. Mathieson expressed no doubt in these meeting notes that nitrogen reductions were necessary to control macroalgae growth. (EPA also notes that these "meeting notes" are not official minutes, may simply be Coalition notes, and EPA does not accept their accuracy in toto; however EPA believes that on this issue the notes appear to correctly express Dr. Mathieson's views.)	Mischaracterizes the record.
71	V.c.i	Dr. Mathieson also noted that the form of nitrogen that should be control is nitrate, not TN, as macroalgae take this bioavailable nitrogen directly out of the water column. Id.	RTC at 59 (Ex. 1); Petitioner Exhibit 1U at 4	In this document Dr. Mathieson indicates that both nitrate and ammonia (DIN) are of concern. EPA has concluded that discharges of other forms of nitrogen must also be controlled in order to effectively control nitrate in the water column, because they will convert to bioavailable forms.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not

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					demonstrate clear error on EPA's part.
71	V.c.i	In conclusion, EPA's assertion that macroalgae growth is documented to be excessive, precluding eelgrass reestablishment in the Great Bay system has no reasonable scientific foundation. <sup>66</sup>	RTC at 44, 55, 58, 103 (Ex. 1)	As indicated above, the document cited by the Coalition, the Coalition's own comments, and the document cited by EPA in the RTC, indicate that macroalgae growth in Great Bay is excessive.	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
71	V.c.i	Footnote 66. The Coalition makes no separate rebuttal to the observations of Dr. Viella [sic], submitted on behalf of CLF. All of his observations are generalized and not based on Great Bay specific data.	RTC at 12 (Ex. 1) . Valiela and Kinney Review at 1 (Ex. 29).	Dr. Valiela's observations are based on Great Bay specific documents and are not "generalized" as characterized by the Coalition. However EPA has not relied on Dr. Valiela's comments as direct evidence of the existence of macroalgae impacts.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
71	V.c.i	The data confirms that eelgrass populations continue to rebound from the 2006 decline regardless of what level of macroalgae growth is occurring in the system. Moreover, the recent data confirms macroalgae growth on the tidal flats has significantly declined in areas previously highlighted by EPA and DES in the permit meetings and the cause for this change needs to be understood before one can claim that additional nitrogen reductions are necessary to protect the biological integrity of the system.	RTC at 16 (Ex. 1)	Limited short term regrowth of eelgrass is consistent with short term variability in the long term dataset and does not indicate that there is no impact on eelgrass from macroalgae.	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
71	V.c.i	Lastly, there is no information in the record showing that stringent nitrogen reduction is required at this time to control macroalgae growth	RTC at 44, 55, 58, 103 (Ex. 1)	As indicated above, the document cited by the Coalition, the Coalition's own comments, and the documents cited by EPA in the RTC, indicate that nitrogen reduction is required at this time.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
71	V.c.i	The lead expert on macroalgae has reiterated that the degree of acroalgae and nitrogen control needed is simply unknown but if it is to occur, nitrogen reduction should focus on reducing nitrate	Petitioner Exhibit 1U at 4-5; RTC at 59	EPA recognizes that Dr. Mathieson does not know the degree of nitrogen control to control macroalgae, but has stated that reductions are necessary now. Dr. Mathieson indicated that both nitrate and ammonia concentrations must be controlled; EPA has concluded that total	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to

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		levels.		nitrogen limits are necessary to effectively control these parameters.	substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
72	V.c.i	Those nitrate levels have dramatically declined in the past three years to the level that existed when significant macroalgae did not exist in this system (pre-1990 levels). (See Burack 2012 Letter at 11("DES agrees that average annual DIN concentrations at Adams Point have decreased in the last four years and are similar to concentrations measured in the 1970s.")).	Burack letter dated October 19, 2012, attachment at 11 (Ex. 32).	The Burack letter goes on to express that DIN is not the appropriate measure: "DES agrees that average annual DIN concentrations at Adams Point have decreased in the last four years and are similar to concentrations measured in the 1970s. However, as discussed previously, DIN is an inferior indicator of nitrogen pollution compared to TN because DIN is a subset of TN that is the most reactive in the environment. DIN does not include nitrogen that is incorporated into plants and organic matter. DIN concentrations in the water can be very low during period of high plant growth because the DIN is pulled out of the water and incorporated into phytoplankton, macroalgae, and other plants."	Mischaracterizes the record.
72	V.c.i	Thus, it is not apparent whether any further TIN control is necessary for macroalgae control and the reliance on DES' 2010 WLA document to project those "necessary" reductions is thoroughly unsupported. <sup>67</sup> [Footnote 67. The 2010 WLA document only assessed the degree of treatment needed to achieve a 0.3 mg/l TN level in various areas of the system – it had no analysis of the degree of TIN control needed to limit macroalgae growth.]	RTC at 59, 97-100 (Ex. 1).	TN, not TIN, is the appropriate parameter to control. RTC at 59. It is clear that nitrogen reduction is necessary for macroalgae control. The Coalition itself admitted this in its comments, although arguing for a higher permit limit. RTC at 99-100 ("The proposed permit should be withdrawn and republished to reflect an 8 mg/l TN level of treatment should be sufficient to abate the increases in macroalgae that have occurred in the system"[sic]). EPA agrees that the 2010 Loading Reduction Report is based on the 0.3 mg/l target from the 2009 Great Bay Nutrient Report, based on multiple lines of evidence including macroalgae control. However even if the total nitrogen criteria were 0.36 mg/l a permit limit of 3.0 mg/l would still be necessary. RTC at 98.	Mischaracterizes the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
72	V.d	<b>d. EPA improperly ignored the significant impact the 2006 extreme weather had on the data sets.</b>			
72	V.d	The central premise of EPA's action is that eelgrass populations declined as a direct result of nitrogen inputs causing some form of excessive plant growth (water-column algae, macroalgae, or epiphytes). The Coalition noted that there was no data developed anywhere in the Great Bay system that ever made this demonstration and that EPA acknowledged, in the original Fact Sheet, that the cause of eelgrass population changes was unknown.	Fact sheet at 17, 18-24 (Ex. 2).	The Fact Sheet states that the cause of eelgrass loss in the Lamprey River after 1948 is unknown. The Fact Sheet does not state that the cause of eelgrass populations elsewhere in the system is unknown; rather it contains extensive discussion of the basis for its conclusion that eelgrass loss is the result of eutrophication due to nitrogen enrichments.	Mischaracterizes and/or ignores portions of the record.
72	V.d	In the face of this admission, it is clear that EPA's claim that nitrogen inputs are the cause of the eelgrass decline is simply speculation and is insufficient to support the imposition of stringent nitrogen reduction requirements.	Id.; Fact sheet at 28 (Ex. 2).	There is no such admission, as EPA did not state that the cause of eelgrass decline outside of the Lamprey River is unknown; further the basis for imposition of the nitrogen limits is that "Discharges from the Newmarket POTW clearly have the reasonable potential to contribute to water quality standards violations".	Mischaracterizes and /or ignores portions of the record.
72	V.d	The Coalition conducted further analysis of archived data and new data after the close of the public comment period to determine if a cause of the eelgrass declines could be determined from the data. (Exhibits 18 and 19). Those evaluations	Petitioner Exhibits 18 and 19; RTC at 2 fn 1 (Ex. 1).	Petitioner's Exhibits 18 and 19 consist of email messages with attached buoy data (Exhibit 18) and a document that appears to be notes of a conversation between Dean Peschel and a representative of NH Fish and Game. Petitioner Exhibit 18 contains no "analysis" and Exhibit 19 does not concern weather conditions at all. EPA notes that the data relevant to the	Not preserved although reasonably ascertainable. Mischaracterizes and/or ignores portions of the record, including

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		demonstrated the following:		Coalition's claim here dates to before the close of the public comment period and is not dependent on "new data", and therefore there is no reason such claims could not have been submitted during the public comment period.	EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
73	V.d	<ul style="list-style-type: none"> <li>Although inorganic nitrogen, by implication TN, rose significantly from 1990-2005, there was never an indication that algal growth increased or that eelgrass populations were adversely affected by this event. (This was confirmed by the 2012 PREP report and Commissioner Burack's October 19, 2012 letter).</li> </ul>	RTC at 102 (Ex. 1); PREP 2009 Data Report (chlorophyll-a trends) (Ex. 50);	This is an incorrect characterization. Trend analysis of chlorophyll-a (the indicator of phytoplankton algae) is more complicated than indicated by the Coalition and is discussed at length in the RTC. Data through 2008 indicated an increasing trend (i.e. the statement that "there was never an indication that algal growth increased" is clearly false), although analysis of data through 2011 did not demonstrate a statistically significant trend. See RTC at 102. In addition, algal growth also includes macroalgae, populations of which were documented in 1996 and 2007 and showed a dramatic increase during that period. Eelgrass populations have experienced a long term decline that was evident from data through 2004, as shown in the 2006 State of the Estuaries Report.	EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
73	V.d	<ul style="list-style-type: none"> <li>Through 2005, the State considered eelgrass populations in Great Bay to be healthy and unimpaired. Consequently eelgrass impairments never appeared in contemporaneous in the Section 303(d) lists during this period. (Confirmed in 2000- 2006 PREP reports and depositions).</li> </ul>	PREP 2006 State of the Estuaries Report at 20 (Ex. 18).	This is misleading; while these waters had not yet been listed as impaired, the decline of eelgrass was documented and identified as a concern prior to any impacts from 2006 weather events. The PREP 2006 State of the Estuaries Report documents a decline of 17% in eelgrass coverage and 41% in eelgrass biomass between 1996 and 2004.	
73	V.d	<ul style="list-style-type: none"> <li>In 2006, a major flood occurred in the system and eelgrass populations dramatically declined in numerous areas of the estuary. These extreme flow conditions were accompanied by very poor transparency in Great Bay due to increased turbidity and color being forced out of the tidal rivers into the main parts of the estuary. As a result of the dramatic eelgrass decline in 2006, DES determined it was necessary to declare the Bay impaired in its 2008 Section 303(d) report. (Deposition Exhibit 36). Coalition experts subsequently submitted detailed evaluations of eelgrass acreage versus rainfall effected parameters which showed a high correlation between eelgrass health and tributary river flow (a surrogate for rainfall and indicator of higher color loading to the system).</li> </ul>	RTC at 15-16, 73, 83; 105 (discussion of reliance on long term trends); RTC at 88, 102 (eelgrass decline began in 1996) (Ex. 1); 2006 State of the Estuaries (eelgrass decline evident based on data through 2004) (Ex. 18); deposition exhibit 36 does not appear to be in the Petition exhibits, but see Currier testimony at 107.	EPA's conclusions are based on the long term record which demonstrates a long term decline in eelgrass populations that was evident prior to 2006. EPA reasonably concluded that the impact of the 2006 event, which resulted in eelgrass measures falling below the long term trend line before rebounding slightly towards the long term trend line in 2007 and 2008, was completely consistent with the long term trend that of decline that preexisted and therefore is unrelated to 2006 weather events. The cited Deposition testimony does not support the contention that the declaration of the Bay as impaired was the result of the 2006 decline. The testimony merely indicates that this was a newly listed impairment. (See Exhibit 12, Currier Deposition at 107). The long term pattern of eelgrass decline in Great Bay began in 1996 and was evident prior to 2006. 2006 State of the Estuaries Report. The "detailed evaluations" referenced by the Coalition consist of a single graph submitted after the close of the public comment period (on August 15, 2012, Coalition Exhibit 13). While EPA did not respond formally to this untimely comment, EPA does not consider this graph indicative of any significant long term correlation between eelgrass health and tributary river flow as there was no such correlation in the period prior to 2006; it appears the supposed correlation reflects only the influence of the extreme 2006 flows, which may have caused a greater than usual dip in the period immediately following 2006, consistent with the recognized variability around the trendline of overall decline over time that was evident prior to 2006.	Not preserved although reasonably ascertainable. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
73	V.d	<ul style="list-style-type: none"> <li>Available transparency data from a buoy moored in Great Bay confirmed 2006 had the worst transparency on record during the high flow periods which coincided with the peak spring growing season for eelgrass in the system. These analyses were presented to DES (Trowbridge) who admitted under oath that DES had not considered whether the floods had caused the dramatic eelgrass decline in 2006 and he acknowledged that could have been the factor that caused the declines to occur in 2006. (Exhibit 15 at 6-</li> </ul>	RTC at 15-16, 73, 83; 105 (Ex. 1)	The buoy data shows CDOM only, not total transparency (Exhibit 15), although it is likely that high flows were also accompanied by high turbidity. EPA agrees that the unusually steep declines in 2006 may be related to the unusually high flows in 2006, which resulted in high nitrogen loads and other impacts, but this does not disturb the conclusions based on the long term trends and is consistent with the recognized short term variability around the long term trendline.	Not preserved although reasonably ascertainable. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.

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		7, 9, 10).			
74	V.d	One would have thought that EPA would find this information highly important, since EPA's response to comments chided the Coalition for not providing an explanation regarding what could have caused system-wide eelgrass declines.	RTC at 15-16, 73, 83; 105 (Ex. 1)	Again, EPA's conclusions are based on the long-term trends, evident before as well as after 2006. The Coalition's only response to EPA's conclusions is an incorrect statement that there was no decline in eelgrass prior to 2006. The documents the Coalition cited (PREP reports) clearly indicate that the Coalition's statement is false and a decline in eelgrass populations was evident based on data through 2004.	Mischaracterizes and/or ignores the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
74	V.d	EPA's response to this information was astounding. They simply ignored the detailed supplemental analysis of the available data. (See RTC at 2 n.1). EPA claimed that DES subsequently disagreed with these conclusions and therefore the conclusions lacked merit. <sup>68</sup> The "source" of this "fact" was the October 19, 2012 Burack letter. However, EPA cannot simply ignore sworn deposition testimony by Mr. Trowbridge stating that the eelgrass losses could have been caused by the 2006 floods and that, if so, the eelgrass decline would not be a violation of narrative criteria since floods are natural occurrences. (Exhibit 15 at 6-7, 9).	RTC at 15-16, 73, 83; 105 (reliance on long term trends; RTC at 88, 102 (eelgrass decline began in 1996) (Ex. 1)	It is not clear whether the Coalition is claiming that EPA ignored this information or that EPA specifically rejected it citing the NHDES letter. In either case, as discussed above and in the RTC EPA concluded that the additional information did not disturb its conclusions, which are based on the long term record. The Coalition's hypothetical - that IF the eelgrass loss of concern was only that occurring after the 2006 floods, EPA should consider whether it constitutes a natural occurrence - is not consistent with the facts that indicate a long term eelgrass decline starting in 1996. The deposition testimony, and the invalid conclusions drawn therefrom, are discussed in <i>Appendix B</i> .	Not preserved although reasonably ascertainable. Mischaracterizes and/or ignores portions of the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. As mere speculation, lacks the specificity necessary for Board review.
74	V.d	Given this fact, it is essential that the impact of the 2006 floods be accurately assessed because if the Coalition's position is correct there is no eelgrass related impairment in this system; there is simply eelgrass loss due to a natural event and ongoing recovery from this natural event. Consequently, EPA's refusal to address the Coalition's comments on this issue (or to have itself evaluated the information from the 2006 buoy records) was clear error.	RTC at 15-16, 73, 83; 105 (reliance on long term trends; RTC at 88, 102 (eelgrass decline began in 1996) (Ex. 1)	As Coalition's factual description is false, the Coalition's conclusion is incorrect.	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
74	V.d	Because it is apparent that the regulatory agencies failed to assess (1) the impact of the largest hydrologic events that have occurred in the past hundred years and (2) how those events could likely have caused the eelgrass declines occurring immediately thereafter, it is clear that EPA's conclusion that nitrogen reductions is the remedy to the eelgrass declines is in error. EPA's decision making process on this issue was fundamentally flawed in failing to accurately consider and assess the available information.	RTC at 15-16, 73, 83; 105 (reliance on long term trends; RTC at 88, 102 (eelgrass decline began in 1996) (Ex. 1)	As Coalition's factual description is false, the Coalition's conclusion is incorrect.	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
75	V.e.	<b>e. EPA applied an incorrect return frequency to determine the proposed limits.</b>			
75	V.e.	A related issue to the major flooding in 2006, is the improper use of extreme wet weather periods to set requirements under the State's narrative criteria. As noted by the Coalition these	RTC at 107 (Ex. 1); NHDES 2010 Load Reduction Report, Appendix C at Table	EPA did not use a hundred year return period to set requirements under the State's narrative criteria. Both wet weather and drier period were used to set the permit requirements, as the analysis included the periods 2003-04 as well as 2005-06 and 2007-08. This set of two-year	Not preserved although the issue was reasonably ascertainable. Mischaracterizes and/or ignores

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		conditions (rainfall occurring 2005-2008) was a once-in-a-hundred-year wet weather period.	3 (Ex. 42); Petitioner Exhibit 1Y	average periods were properly used under the State's narrative criteria.	portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
75	V.e.	This resulted in dramatically higher nonpoint source loadings coming into the system for a host of parameters and DES used those loading conditions from the extreme wet weather years as its baseline for evaluating necessary permit reductions to achieve its assumed numeric criteria.	RTC at 107 (Ex. 1); NHDES 2010 Load Reduction Report, Appendix C at Table 3 (Ex. 42); Petitioner Exhibit 1Y	Loading conditions from average years (2003-04) as well as periods containing wet years (2005-06 and 2007-08; although 2007 was not particularly wet) were used as baselines and all baselines demonstrated the need for the required load reductions.	Not preserved although the issue was reasonably ascertainable. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
75	V.e.	The DES 2010 WLA report, relied upon by EPA demonstrated how sensitive the reduction requirements were to the base year chosen to calculate required reductions. (2010 WLA Appendix C).	RTC at 107 (Ex. 1); NHDES 2010 Load Reduction Report, Appendix C at Table 3 and page 5 (Ex. 42)	The 2010 Loading Reduction Report shows minor difference in load reduction requirements among the wetter and drier periods. The Report demonstrates the need for a 3 mg/l limit (with additional NPS reduction) under all baseline conditions considered, including the 2003-04 period. The only impact of the baseline is on the amount of NPS reduction needed; for eelgrass in Great Bay proper the calculated NPS reduction is 20% for 2003-04, 21% for 2007-08; and 28% for 2005-06. As NHDES explains in that report, while loads increase in wet weather due to increased stormwater loads, the loading threshold also increases due to higher rates of hydraulic flushing.	Not preserved although the issue was reasonably ascertainable. Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response.
75	V.e.	As confirmed by the data presented in the Burack 2012 Letter (Figure 4), years subsequent to 2008 (2009-2011) also had wet weather but these were not record rainfall years. As a consequence inorganic nitrogen levels as well as TN levels declined substantially throughout the system. These declines also produced much lower system loadings of nitrogen as demonstrated by the charts presented by EPA and DES in the permit meetings, after the period closure, and the Burack 2012 Letter. Id.	Burack letter dated October 19, 2012, attachment at 17 (Ex. 32).	The characterization of system-wide decline is inaccurate; inorganic nitrogen and TN levels each show a lowering recent trend in 2 out of 8 stations reported by PREP. PREP 2012 at 2-4. System loadings in the years subsequent to 2008 are essentially the same as during 2003-04, one of the baseline periods used in the 2010 Loading Reduction Report.	Mischaracterizes/unsupported by the record.
75	V.e.	Based on this information, it is clear that the need for the degree of nitrogen reduction proposed by EPA is highly sensitive to the baseline year used for the analysis. The Coalition noted that a once-in-a-hundred-year condition is not consistent with proper criteria application or permit development as follows:	RTC at 107 (Ex. 1); NHDES 2010 Load Reduction Report, Appendix C at Table 3 (Ex. 42)	As the Coalition's facts are incorrect, their conclusion is unsupported	Not preserved although the issue was reasonably ascertainable. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
75	V.e.	<ul style="list-style-type: none"> <li>The excepted Federal standard for a return frequency on criteria compliance is once-in-a-3-year average. (See 1985</li> </ul>	Technical Support Document for Water Quality-Based	This statement is incorrect. Criteria include duration and frequency components. For toxics criteria, the recommended duration and frequency are chronic criteria based on a four-day	Not preserved although the issue was reasonably ascertainable.

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		National Guidelines and EPA Nutrient Criteria developed for State of Florida.).	toxics Control at 36 (Exhibit 51)	duration concentration that may be exceeded no more than every three years, and acute criteria based on a one-hour concentration to be exceeded no more than every three years. TSD at 32. These are biological return periods that do not equate to flow return periods; i.e. the three year return period for toxics criteria is intended to be roughly equivalent to a 7Q10 flow return period. TSD at 36. For nutrient criteria, a three year return frequency is not an established standard, see EPA 2001 at 7-11, 7-13 to 14, although EPA Nutrient Criteria developed for the State of Florida define criteria based on an annual geometric mean concentration that should not be exceeded more than once in a three-year period. As another example, the Chesapeake Bay nutrient TMDL is based on a ten-year return period. The purpose of a return period is to allow an ecosystem a period of recovery after an excursion over water quality standards. TSD at 36. An entire four year period (2005-08 as suggested by the Coalition) would not be considered outside the scope of applicability of criteria under any of the relevant guidance or standards.	Mischaracterizes/unsupported by the record.
75	V.e.	<ul style="list-style-type: none"> <li>The State employs a once-in-a-ten-year average condition in criteria application for toxics (7/Q/10).</li> </ul>	NH Env-Wq 1700 (Ex. 4); Technical Support Document for Water Quality-Based toxics Control at 36 (Exhibit 51)	The State of NH does employ a 7Q10 condition for toxics criteria, which is a once-in-a-ten-year, seven-day low flow (not a "once-in-ten-year average"). A 7Q10 condition for toxics has been determined by EPA to be the flow-equivalent of the return period applicable to chronic criteria for toxics, which is based on a four-day duration concentration that may be exceeded no more than every three years. TSD at 36.	Not preserved although the issue was reasonably ascertainable. Mischaracterizes/unsupported by the record.
76	V.e.	<ul style="list-style-type: none"> <li>A once-in-a-hundred-year condition is not consistent with the narrative criteria, which is not intended to regulate water quality extreme natural conditions.</li> </ul>	RTC at 107 (Ex. 1); NHDES 2010 Load Reduction Report, Appendix C at Table 3 (Ex. 42); Petitioner Exhibit 1Y	The permit limit is not based on a once-in-a-hundred year return period	Not preserved although the issue was reasonably ascertainable. Mischaracterizes/unsupported by the record.
		<ul style="list-style-type: none"> <li>The once-in-a-hundred-year condition is not consistent with how the criteria were developed (2-5 year average condition). This does not mean a 2-5 year conditions happening once every 100 years. As repeatedly stated in the Response to Comments the criteria must be applied with consistent with how they were derived. These criteria were plainly not.</li> </ul>	RTC at 107 (Ex. 1); NHDES 2010 Load Reduction Report, Appendix C at Table 3 (Ex. 42); Petitioner Exhibit 1Y	The nitrogen targets were developed based on long term datasets; the reduction targets were based on three two-year periods that included wetter and drier periods. The approach of considering three two-year periods was specifically used to provide a relatively long term condition (two years) while allowing evaluation of variability (using three different periods) and is consistent with the scenario analysis.	Not preserved although the issue was reasonably ascertainable. Mischaracterizes/unsupported by the record.
76	V.e.	Based on the above information it is clear that using a once-in-a-hundred-year condition is not scientifically defensible on a host of grounds and that the projections of necessary reductions related to rainfall conditions occurring 2005-2008 should not have been the basis for the analysis.	RTC at 107 (Ex. 1); NHDES 2010 Load Reduction Report, Appendix C at Table 3 (Ex. 42); Petitioner Exhibit 1Y	The permit limit is not based on a once-in-a-hundred year return period	Not preserved although the issue was reasonably ascertainable. Mischaracterizes/unsupported by the record.
76	V.e.	In response, EPA stated that Section 122.44(d) allows them to use maximum conditions. (RTC at 100). And no other response was presented to the misapplication of the criteria (other than EPA's agreement that applying the criteria at 7/Q/10 as originally proposed in the permit was not scientifically defensible).	RTC at 100 (Ex. 1).	The Coalition misquotes the RTC at 100, which does not refer to "maximum conditions." Rather, the RTC states "water quality standards are not just intended to be met under average rainfall years". The proposed nitrogen reductions are not based on maximum loads but on a range of conditions.	Not preserved although the issue was reasonably ascertainable. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.

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76	V.e.	EPA's reliance on Section 122.44(d) to set the criteria return frequency is clear error. Section 122.44(d) is a permit provision that looks to EPA guidance on criteria development to set the appropriate criteria requirements where narrative criteria are being translating into numeric values. (See Section 122.44(d)(vi) referring to reliance on EPA's Water Quality Standards Handbook – which specifies a once in three year recurrence interval is protective of aquatic life at 5-10, 5-11). This regulation nowhere states that once-in-a-hundred-year condition should be the return frequency applied to criteria compliance. As all EPA published guidance, as well as all EPA published numeric criteria for states, specify that a once-in-a-three-year average frequency is protective of ecological conditions, the use of once-in-a-hundred-year condition was clear error and unsupported by any other relevant scientific information in this record.	RTC at 107 (Ex. 1); NHDES 2010 Load Reduction Report, Appendix C at Table 3 (Ex. 42); Petitioner Exhibit 1Y	The permit limit is not based on a once-in-a-hundred year return period	Not preserved although the issue was reasonably ascertainable.
77		A finding that the Coalition's position is correct on this issue necessarily requires a remand of this permit as EPA extensively relied on the 2010 WLA as the basis for choosing necessary limitations in conjunction with appropriate nonpoint source reductions. As that document is premised on the wrong baseline and the new information for the system confirms that existing conditions indicate for less nutrient reduction would be necessary for all sources. As such, the assertion that a 3 mg/L limitation was necessary is plainly erroneous since it relied on the wrong baseline condition. <sup>69</sup>	RTC at 107 (Ex. 1); NHDES 2010 Load Reduction Report, Appendix C at 5, Table 3 (Ex. 42)	The Coalition's argument does not impact the calculated permit limit. The 2010 Loading Reduction Report demonstrates the need for a 3 mg/l limit (with additional NPS reduction) under all baseline conditions considered, including the 2003-04 period with typical rainfalls. The load reduction requirements are not dependent simply on loads but also on the loading thresholds calculated to meet the target TN concentrations. Wetter years have both higher loads and higher loading thresholds (due to increased flushing) and therefore required reductions are not dramatically different across the different time periods. For example, to meet the target for eelgrass in Great Bay the calculated required reduction from the Lamprey watershed is 20% for 2003-04, 21% for 2007-08; and 28% for 2005-06.	Not preserved although the issue was reasonably ascertainable. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
	V.e.	69 A once in three year condition would statistically convert to a rainfall condition that is exceeded 33% of the time. While that analysis is yet to be done, it is apparent that the conditions occurring in 2009-2011 which are significantly wetter than average still would be in the range of the appropriate conditions.	RTC at 107 (Ex. 1); NHDES 2010 Load Reduction Report, Appendix C at Table 3 (Ex. 42); Petitioner Exhibit 1Y	EPA does not agree with the Coalition's description of the appropriate statistical analysis but it is irrelevant, as the 2009-11 conditions that the Coalition admits are within the range of appropriate conditions are similar to the 2003-04 conditions that were in fact considered in determining necessary load reductions.	Not preserved although the issue was reasonably ascertainable. Mischaracterizes/unsupported by the record.
77	V.f.	<b>f. Nitrate levels in Great Bay are not at toxic levels leading to eelgrass declines.</b>			
77	V.f.	As part of the 2009 Numeric Criteria development, EPA recommended that DES include a scientific paper <sup>70</sup> containing experimental evidence for southern estuaries that nitrate may cause toxicity to eelgrass and cause eelgrass populations to decline. This issue was mentioned briefly within the 2009 Numeric Criteria document, but there was no subsequent attempt in the 2009 Numeric Criteria Document to determine whether the conditions evaluated in the Burkholder paper were relevant and applicable to Great Bay.	NHDES 2009 Great Bay Nutrient Report at 55 (Ex. 43).	This is incorrect. The Burkholder et al. (2007) paper cited by the Coalition was referred to in the NHDES 2009 Great Bay Nutrient Report only for the proposition that eutrophication impacts on eelgrass are widespread around the world. (NHDES, 2009a at 55 ("Cultural eutrophication from increased nitrogen loads to estuaries has been shown to be a major cause of seagrass disappearance worldwide (Burkholder et al., 2007; Short and Wyllie-Echeverria, 1996).")). The issue of nitrate toxicity is not mentioned in the 2009 Nutrient Report. The Coalition appears to be confusing the 2009 Report with a different document produced by NHDES in 2010, responding to a June 2010 Coalition memorandum.	Not preserved although the issue was reasonably ascertainable. Mischaracterizes/unsupported by the record.
77	V.f.	The 2009 Numeric Criteria document did note that other states set inorganic nitrogen levels at 0.15 mg/L as protective of eelgrass	Fact sheet at 26 (Ex. 2), RTC at 45 (Ex. 1), NHDES 2009	This is incorrect. The 2009 Nutrient Report's reference to other states' criteria of 0.15 mg/l inorganic nitrogen is not related to toxicity but to eutrophication effects. Long term eelgrass	Not preserved although the issue was reasonably ascertainable.

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		resources- the same level of inorganic nitrogen that was typically present in Great Bay up through 2005 when eelgrass were considered unimpaired. [footnote 70: Burkholder, J.A., D.A. Tomasko, and B.W. Touchett. 2007. Seagrass and eutrophication. Journal of Experimental Marine Biology and Ecology 350: 46-72. ]	Great Bay Nutrient Report (Ex. 43); RTC at 88, 102 (eelgrass decline began 1996 (Ex. 1); PREP 2006 State of the Estuaries Report (Ex. 18); PREP Draft Data Report (July 16, 2012) at 53 (NUT2-22) (Ex. 36).	decline has been determined to have begun in 1996 and was evident as of 2005. Inorganic nitrogen concentrations in Great Bay at Adams Point are shown in the draft 2012 PREP Environmental Indicators Report; average concentrations did not exceed 0.15 mg/l until 1996. EPA and NHDES do not consider DIN to be an appropriate measure of nitrogen pollution as concentrations may vary widely with plant uptake.	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
78	V.f.	In EPA's Fact Sheet, the Burkholder study was mentioned as a part of the "weight of evidence" considered when determining that nitrogen was responsible for eelgrass declines in Great Bay. However, similar to the 2009 Criteria Document there was no attempt to analyze data from the system to determine whether or not the presence of eelgrass was closely related to the degree of inorganic nitrogen present in the system.	Fact sheet at 21 (Ex. 2)	The Burkholder (2007) study is included among a number of references in the Fact Sheet with respect to the conceptual model for eutrophication impacts, as part of the weight of evidence approach. Research and examples from other systems are among the information that is properly considered, along with site specific information, in interpreting narrative criteria under 40 CFR 122.44(d). There was of course extensive analysis of nitrogen in the system and the presence of eelgrass in the 2009 Nutrient Report, although as noted above the analysis is in terms of total nitrogen rather than inorganic nitrogen, and concerned eutrophication impacts rather than toxicity.	Not preserved although the issue was reasonably ascertainable. Mischaracterizes and/or ignores portions of the record.
78	V.f.	The Coalition in an effort to be comprehensive, noted in its comments, that there was no information showing that level of inorganic nitrogen evaluated in the Burkholder paper had any relevance to Great Bay as healthy eelgrass populations existed for decades in the presence of nitrate levels that were supposedly higher than the concentrations evaluated by Burkholder.	RTC at 89 (Ex. 1).	The Coalition's analysis described here, presented in the Coalition's original comments on the permit at Exhibit 10, were addressed in detail in the RTC at 89. As described in the RTC EPA disagrees with the Coalition's use of data and its technical conclusion on this issue.	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response.
78	V.f.	The Coalition also noted that EPA had conducted an eelgrass survey in Great Bay and found that eelgrass beds were "lush" near the Squamscott River, where some of the highest inorganic nitrogen levels would exist in the system due to inputs from the two major tidal tributaries in that area.	RTC at 41 (Ex.. 1)	The referenced eelgrass beds had epiphytic growth and are a small area, within a context of overall decline in eelgrass.	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response.
78	V.f.	EPA, ignoring all of this actual data for the system, responded that nitrogen toxicity was a major issue that warranted imposition of stringent nitrogen requirements to allow eelgrass recovery in the tidal rivers.	RTC at 24 (Ex. 1).	The Coalition mischaracterized EPA's statements. EPA response indicated that nitrate toxicity is one of a number of ways that eelgrass is impacted by nitrogen. (RTC at 24).	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
78	V.f.	EPA response is completely speculative, conclusory and unsupported. It does not constitute a sufficient evaluation of the existing data (showing no indication of nitrate toxicity in this system) or confirm that the weight of evidence shows that nitrate reduction is needed to protect eelgrass.	Fact sheet at 21 (Ex. 2); RTC at 24 (Ex. 1)	EPA's response is a straightforward explanation of the range of impacts of nitrogen on eelgrass. Additional analysis would be necessary to determine what permit limits, if any, would be necessary to address toxicity.	Mischaracterizes and/or ignores portions of the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response.
78	V.f.	EPA's speculation that it took decades of nitrate exposure for eelgrass to finally collapse in 2006 bars credulity and can only be attributed to wishful thinking in an attempt to defend an	RTC at 89 (Ex. 1).	This statement mischaracterizes EPA's conclusions. The decline of eelgrass is a long term trend that was evident in the Great Bay Estuary prior to 2006 and began in 1996. As noted in the RTC, 1974 to 1981 show a median nitrate concentration of 51 ug/l, right at the threshold for	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments,

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		indefensible position. There is no information from the Burkholder paper cited by EPA, showing that a system that has robust eelgrass growth for decades under elevated nitrate levels would suddenly collapse in a three month period a decade later.		direct effects, while the 1992-2009 data shows a median concentration of 81 ug/l, 62 % above the threshold for direct effects. The documented decline in eelgrass began in 1996 and represents neither "decades of growth under elevated nitrate levels" nor a "sudden collapse".	and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
78	V.f.	Moreover, as EPA indicated, the type of degenerative effects found in the Burkholder studies (eelgrass growing then collapsing due to weak cell walls) cannot be found anywhere evidenced in Great Bay or the reports of Dr. Short.		It is not clear what the Coalition is referring to. While EPA did indicate that increased nitrate concentrations would affect eelgrass, it never stated that specific eelgrass effects due to nitrate toxicity are distinguishable from other effects based on available data.	Not preserved although the issue was reasonably ascertainable. Mischaracterizes the record. Lacks specificity necessary for Board review, because it is unclear.
79	V.f.	In addition, the numeric criteria found acceptable by other states and approved by EPA, e.g., the Rehoboth Bay criteria (3 times higher than the 0.05 mg/L value cited by EPA), shows that EPA has not found the Burkholder results to be credible or necessary to ensure eelgrass survival in any northern estuary. EPA's position would have the Board ignore the actual data and survival of eelgrass through this system and instead have let the agency rely on a laboratory study to conclude that the eelgrass should actual not be present despite the fact that they are. This is not a credible position and is clearly erroneous. Laboratory studies do not trump actual use attainment data, as EPA's own regulations (§ 122.44(d)) require the consideration of the actual site-specific data, were available, in rendering decisions on narrative criteria compliance.	RTC at 24, 46 (Ex. 1).	EPA believes the reference to "the Rehoboth Bay criteria" indicates the Delaware 0.14 mg/l DIN criterion. As noted above, that criterion is based on eutrophication impacts. EPA and NHDES have determined that TN is the appropriate measure due to the high variability of DIN due to plant uptake, and the permit limit here is calculated based on a 0.3 mg/l TN target.	Not preserved although the issue was reasonably ascertainable. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
79	V.g	<b>g. Assuming Eelgrass are impaired by nitrogen, EPA is regulating the wrong pollutant form; it should be regulating nitrate not total nitrogen.</b>			
79	V.g	The Coalition stated that if nitrogen had to be regulated given the specific circumstances in Great Bay (short detention time, rapid dilution system) the only form on the pollutant to be regulated should be nitrate.	RTC at 58; RTC at 99 (Ex. 1). NHDES 2009 Great Bay Nutrient Report (Ex. 43). PREP Draft Data Report (July 16, 2012) (Ex. 36), Fact Sheet at 12 (Ex. 2).	EPA disagrees with this assessment as outlined in the RTC. EPA guidance recommends regulation of TN due to cycling among forms of nitrogen. Also, literature shows that DON from POTWs is more reactive than previously thought. Additionally, all forms of DIN are of concern to the system, not only nitrate which the Coalition refers to in the petition. The July 16, 2012 PREP draft data report shows that ammonia can be 50% and more of the DIN in the system. Moreover, the original comments refer to the regulation of TIN rather than nitrate (Coalition comments dated 12/15/11 page 13).	Not preserved although the issue was reasonably ascertainable. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
80	V.g	The coalition supplemented its comments after receiving data showing that nitrate levels in the system plummeted in the past three years. EPA, itself, recognized that macroalgae growth is regulated by nitrate, not total nitrogen. The Coalition also noted	PREP Draft Data Report (July 16, 2012) (Ex. 36). Coalition supplemental comments submitted August 15, 2012.	The July 16, 2012 draft PREP data report shows only one monitoring station (Adams Point) with lower TN (and DIN) concentrations. TN concentrations at all other locations showed no recent changes. Nitrate is not the only DIN concern. The draft PREP data report shows that ammonia can be 50% and more of the DIN in the system. Also, literature shows that DON from POTWs is	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively

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		that the form of nitrogen that should be regulated if water-column algal growth were the issue for the system and in particular the tidal rivers, would exclusively be nitrate since the detention time in those rivers is too short for any meaningful amount of organic nitrogen to convert to inorganic form.	Burrack letter dated October 19, 2012. Fact Sheet at 12 (Ex. 2).	more reactive than previously thought.	confront EPA's response.
80	V.g	EPA's response contained no information indicating that any significant level of organic nitrogen would convert to inorganic forms in this system.	RTC at 59; RTC at 99 (Ex. 1). NHDES 2009 Great Bay Nutrient Report (Ex. 43). Fact sheet at 12 (Ex. 2).	EPA disagrees. Literature shows that DON from POTW is more reactive than previously thought. The Coalition's own consultant acknowledges "...some organic nitrogen will be converted to inorganic nitrogen in the Great Bay (HydroQual, Estimation of DIN Loads to the Great Bay Estuary System, 1/16/12, pgs. 4-5).	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
80	V.g	The nutrient criteria guidance documents cited by EPA (RTC @99), generally indicate that total pollutant form may be regulated but federal guidance further indicates, in shortened detention time systems, that the inorganic forms maybe the proper form to regulate. The key issue is whether the system has sufficient detention time to allow for the significant conversion from organic to inorganic forms given the type of inorganic nitrogen and the retention time. EPA is well aware that this is a short detention time estuary but ignored the relevance of this factor on determining which form of nitrogen is the one to regulate to limit excessive plant growth (assuming arguendo, it is occurring).	RTC at 59; RTC at 99 (Ex. 1). NHDES 2009 Great Bay Nutrient Report (Ex. 43). Fact sheet at 12 (Ex. 2).	No citation was provided regarding the federal guidance on regulating inorganic forms in shortened detention time systems. Literature shows DON from POTWs is more reactive than previously thought. EPA cited studies indicating that a substantial portion of organic nitrogen becomes bioavailable within two days, close to the Lamprey River detention time of 1.5 days cited by the Coalition.	Lacks specificity necessary for Board review. At most, it is a bona fide difference of technical opinion on detention time that does not demonstrate clear error on EPA's part.
81	V.g	The effect of regulating TN versus nitrate dramatically impacts the level of nutrient control that may be required, particularly given the recent arguments raised by EPA and DES for this system, i.e., the main issue is macroalgae control.	RTC at 57 - 59; RTC at 99 (Ex. 1). Fact Sheet at 12 (Ex. 2).	EPA disagrees. All forms of DIN are of concern to the system (not just nitrate). Total nitrogen needs to be regulated because of cycling between different forms. Main issue is not just macroalgae. Regardless of nitrogen form regulated, denitrification to low levels will be needed.	Not preserved although the issue was reasonably ascertainable. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
82	V.g	Information present in the Response to Comments and un-refuted by EPA, shows that achieving a 8 mg/L TN limitation should produce a 40% or greater reduction in inorganic nitrogen levels in the system during the critical period for macroalgae growth. This is well below the level that DES has indicated would be needed for macroalgae control (10-20% reduction). Therefore, the decision on which pollutant to regulate critically affects the degree of treatment that may be necessary in this system. EPA's failure to adequately assess the importance of these factors in	RTC at 100-101, 97-98 (Ex. 1).	This is inaccurate. EPA specifically refuted the Coalition's analysis of the reductions in inorganic nitrogen that would be achieved by an 8 mg/l TN limitation at RTC pages 100-101, showing that the Coalition's analysis was based on false assumptions regarding the proportion of DIN in the discharge and the variability in TN concentrations. EPA also refuted the Coalitions' contention that a 10-20% reduction in nitrogen discharges would achieve a target for macroalgae control, showing that the 10-20% reduction in TN concentrations would require a higher reduction in nitrogen discharges due to the nitrogen content in seawater. RTC at 97-98.	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not

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		determining the "necessary" requirements under Section 122.44(d) and the state's narrative standard was clear error.			demonstrate clear error on EPA's part.
82	V.g	EPA's failure to adequately assess the importance of these factors in determining the "necessary" requirements under Section 122.44(d) and the state's narrative standard was clear error.	RTC at 58 - 59; RTC at 99 (Ex. 1). Fact Sheet at 12 (Ex. 2).	The RTC clearly addresses the issue of regulating TN vs DIN (or TIN). Due to cycling of DON to DIN , TN should be limited. Effluent derived DON can convert to DIN within two days. The upper parts of the estuary have a detention time of up to 18 days (36 tidal cycles).	Not preserved although the issue was reasonably ascertainable. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
82	V.h	<b>h. EPA ignored the MOA conclusions on the appropriate requirements for point sources in the Great Bay estuary.</b>			
82	V.h	The Coalition commented that the MOA developed <i>after the 2009 Numeric Criteria and 2010 WLA documents were finalized</i> , determined that the scientific information relied upon in those documents was uncertain, required additional analyses and justification and that those criteria should not be applied in the development of permit limits. (See Exhibit 1T and 1U). Moreover, the MOA concluded that until such time as more detailed information could be developed to support the need for more stringent reductions, limitations more restrictive than 8 mg/l TN should not be imposed. <i>Id.</i> EPA's response rejected the MOA and its conclusions <i>in toto</i> . That is a clear violation of the applicable Federal regulations governing decision making on water quality-based permits.	RTC at 62 - 65; RTC at 65 – 67 (Ex. 1).	After signing the MOA, DES (in written correspondence) stated "DES stands by those criteria". Additional time was give to the Coalition to sample the Squamscott River and develop a model. Data from the sampling showed water quality consistent with eutrophication, and a model was never developed. Use of the 2009 Nutrient Criteria Report is consistent with 122.44(d)(1)(vi).	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
83	V.h	First, EPA pointed to letters sent to non-MOA signatory communities, to claim DES supported application of more restrictive requirements. However, those letters do not refute the MOA.	RTC at 65 – 66 (Ex. 1).	EPA disputes the need to "refute" the MOA at all. With that said, these letters effectively do refute the MOA stating "... These criteria are the result of comprehensive analyses by DES scientists, which have been peer reviewed. DES stands by those criteria."	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
83	V.h	Secondly, EPA repeatedly relied on DES criticisms of Coalition position developed by Mr. Trowbridge <u>prior</u> to signing the MOA as the basis for its position. What EPA failed to note is that the Coalition had several meetings with DES to discuss Mr. Trowbridge's response and the Coalition provided specific	RTC at 65 – 67 (Ex. 1).	Letters from DES <u>after</u> signing the MOA to Newington, CLF, Great Bay Trout Unlimited, and NH Coastal Protection Partnership state "DES stands by those criteria". The MOA allowed the Coalition to gather data on the Squamscott River and develop a hydrodynamic model. EPA stated that it would consider this new information. The data collected showed the impacts of nitrogen enrichment (high chlorophyll-a, wide DO swings) and no hydrodynamic model was	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's

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		information that demonstrated that those positions were in error. Rather than proceeding to an independent peer review, which DES had previously concurred that it would allow, the parties agreed to issue an MOA that jointly recognized the scientific uncertainties and need for additional scientific information and analyses as the parties were now in agreement that the 2009 Numeric Criteria document had major differences. Thus EPA's attempt to use earlier evaluations by Mr. Trowbridge to discount later MOA findings signed by the Commissioner was clear error.		ever produced. EPA has based the effluent limit for TN on the best available information including the DES 2009 Great Bay Nutrient Report which has not been shown to be in error. The Great Bay Nutrient Report has been subject to public review and has been peer reviewed by two world renowned estuarine scientists.	response, which was rational in light of the entire record.
83	V.h	Section 122.44(d) plainly indicates that state regulatory interpretation regarding narrative criteria compliance need to be respected (unless obviously incorrect). EPA's entire permitting approach disregards those findings, <u>signed by the Commissioner</u> , is clear error and the MOA provisions applicable to proper implementation of the narrative criteria must be respected. <i>Kentucky Waterways Alliance v. Johnson</i> , 540 F.3d 493, 469 n.1 (6th Cir. 2008) ("In interpreting a state's water quality standard, ambiguities must be resolved by 'consulting with the state and relying on authorized state interpretations."); <i>Marathon Oil Co. v. Environmental Protection Agency</i> , 830 F.2d 1346, 1351-1352 (5th Cir. 1987) (EPA is merely an "interested observer" as to how a state interprets its WQS provisions); <i>American Paper Inst. v. EPA</i> , 996 F.2d 346, 351 (D.C. Cir. 1993) ("Of course, that does not mean that the language of a narrative criterion does not cabin the permit writer's authority at all; rather, it is an acknowledgement that the writer will have to engage in some kind of interpretation to determine what chemical-specific numeric criteria--and thus what effluent limitations--are most consistent with the state's intent as evinced in its general standard.") (emphasis added). Adherence to the MOA findings would have resulted in a conclusion that the 2009 Numeric Criteria should not be applied to generate restrictive limits and that the most restrictive effluent limits justified at this time for narrative criteria compliance would be 8 mg/l TN.	RTC at 65 – 67 (Ex. 1).	After signing the MOA, DES (in written correspondence) stated "DES stands by those criteria". Additional time was given to the Coalition to sample the Squamscott River and develop a model. Data from the sampling showed eutrophication impacts and a model was never developed. Use of the 2009 Nutrient Criteria Report is consistent with 122.44(d)(1)(vi).	Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
84	V.i	<b>i. EPA ignored the admissions made by the author of 2009 Nutrient Criteria document stating that the information relied upon was in error.</b>			
84	V.i	However, EPA has purposefully ignored the admissions made by the author of the 2009 Numeric Criteria document (Mr. Trowbridge), <i>under oath during deposition testimony</i> (and confirmed by the Burack 2012 Letter), showing the 2009 Numeric	Coalition Supplemental Comments August 15 and 30, 2012.	The comment period for the draft permit closed on December 16, 2011. The comments forwarding the Trowbridge deposition were submitted on August 30, 2012 (more than eight months after the close of the public comment period). After a review of the applicable deposition transcripts, the "admissions" asserted by the Coalition simply do not exist. No	Not preserved. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails

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		Criteria document was severely flawed and did not properly implement the State's narrative criteria.		references to deposition pages or deposition exhibits are given. The NHDES 2009 Great Bay Nutrient Report is not scientifically flawed and was in fact developed using a valid scientifically defensible approach. The deposition testimony, and invalid conclusions drawn therefrom, are addressed in <i>Appendix B</i> .	to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review.
84	V.i	The following summarizes the key admissions may by Mr. Trowbridge under oath, presented to EPA in supplemental comments (Exhibit 15).			
84	V.i	<ul style="list-style-type: none"> <li>The numeric TN criteria for eelgrass and DO were not based on a demonstrated "cause and effect" relationship <i>and both the state and EPA know that these numeric criteria were based on confounded correlations that did not show TN caused the claimed changes in either transparency or DO.</i></li> </ul>	RTC at 111 – 114 (Ex. 1). Burack Letter dated October 19 (Ex. 32), 2012; NHDES, Response to Public Comment on the Draft 2012 Consolidated Assessment and Listing Methodology (CALM) (Ex. 37)	Nowhere in Mr. Trowbridge's deposition does he state or admit that "both the state and EPA knew that these numeric criteria were based on confounded correlations that did not show TN caused the claimed changes in either transparency or DO." See page 112 of the RTC "The comment is incorrect in stating that the factors and changing conditions identified in the comment were not considered by NHDES. Flushing time, freshwater inflow, and stratification effects are all reflected in the extensive data set utilized to develop the NHDES Great Bay Nutrient Report." The deposition testimony, and invalid conclusions drawn therefrom, are addressed in <i>Appendix B</i> .	Not preserved. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.
85	V.i	<ul style="list-style-type: none"> <li>Algal levels in the system did not change materially from 1980 to present, despite an estimated 59% increase in TIN between 1980 and 2004 and <i>therefore TN inputs could not have caused changed transparency in the system.</i></li> </ul>	RTC at 102 – 104 (Ex. 1). Burack Letter dated October 19, 2012; NHDES, Response to Public Comment on the Draft 2012 Consolidated Assessment and Listing Methodology (CALM) (Ex. 37).	Nowhere in Mr. Trowbridge's deposition does he state or admit that "TN inputs could not have caused changed transparency in the system". While data up to 2006 did not show a significant trend in chlorophyll-a the later analysis done in 2009 did show a trend. From page 103 of the RTC "The commenter's citation of the Fact Sheet omits the references to the PREP 2009 State of the Estuaries Report, which documents that the negative effects of excessive nitrogen, warned of repeatedly in the prior reports, have in fact become evident. The full discussion of the 2003, 2006 and 2009 State of the Estuaries Reports in the Fact Sheet demonstrates the continued deterioration of environmental indicators in the Great Bay Estuary, consistent with predictions and warnings made regarding the expected result of increasing nitrogen concentrations. Far from indicating that the ability of nitrogen to affect transparency is "not very significant at this time," as suggested in the comment, the 2009 PREP report specifically states, "The negative effects of the increasing nutrient loads are evident. Water clarity has declined as shown by increasing concentrations of suspended solids and chlorophyll-a." (PREP, 2009a at 4)." The deposition testimony, and invalid conclusions drawn therefrom, are addressed in <i>Appendix B</i> .	Not preserved. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part. Lacks specificity necessary for Board review.
85	V.i	<ul style="list-style-type: none"> <li>The best available information shows that transparency in Great Bay and Lower Piscataqua River did not change materially from 1990 to 2005; <i>therefore this parameter could not be the factor causing eelgrass declines found in the system prior to that time as assumed in the draft 2009 Numeric Criteria.</i></li> </ul>	Burack Letter dated October 19, 2012 (Ex. 32); NHDES, Response to Public Comment on the Draft 2012 Consolidated Assessment and Listing Methodology (CALM) (Ex. 37).	Nowhere in Mr. Trowbridge's deposition does he state or admit "The best available information shows that transparency in Great Bay and Lower Piscataqua River did not change materially from 1990 to 2005; therefore this parameter could not be the factor causing eelgrass declines found in the system prior to that time as assumed in the draft 2009 Numeric Criteria." Also, it is not clear what "best available information" the Coalition is referring to since no specific citations or references to the deposition are given.	Not preserved. Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part. Lacks specificity necessary for Board review.

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85	V.i	<ul style="list-style-type: none"> <li>Transparency in the major tidal rivers is poor, but the available data (not previously analyzed by DES) shows that (1) the effect of algal growth on transparency is negligible (2) CDOM and turbidity are the key factors controlling transparency in the system and (3) regulating TN in the tidal rivers <i>will not result in any demonstrable improvement in transparency.</i></li> </ul>	<p>Burack letter dated October 19, 2012 (Ex. 32); NHDES, Response to Public Comment on the Draft 2012 Consolidated Assessment and Listing Methodology (CALM) (Ex. 37); RTC at 114 - 115 (Ex. 1).</p>	<p>Each of these issues were addressed by DES in the October 19, 2012 Burack letter: (1) "The portion of the July 11, 2012 deposition relevant to this statement is based on a series of graphs created by the Coalition that relate phytoplankton as chlorophyll-a to water clarity in the Squamscott, Lamprey, and Upper Piscataqua Rivers. The graphs used in the deposition show data from each river separately. Different types of graphs were used for the different rivers and, in the case of the Upper Piscataqua River graph, unproven assumptions about Secchi disk measurements were used. The point of the graphs was to attempt to show that chlorophyll-a was not well correlated with water clarity and, therefore, that other factors such as turbidity and colored dissolved organic matter (CDOM) must be controlling light attenuation. During the deposition, DES staff agreed that the graphs supported those conclusions. "; (2) "DES does not dispute that colored dissolved organic matter (CDOM) and turbidity are important factors related to water clarity in the tidal rivers. However, eelgrass was mapped in significant quantities in the tidal rivers in 1948 (DES, 2012 at 14). If "naturally occurring CDOM and turbidity" were the only factors controlling transparency (and presumably eelgrass survival) in the rivers, it would not have been possible for eelgrass to have existed in these areas at all." Note that in the Coalition's 12/15/11 comments they refer to naturally occurring color and turbidity (page 18, item 12) but the reference to naturally occurring is left out of this statement in the petition; (3) "The assumption that regulating TN will not have any "demonstrable improvement in transparency or allow for eelgrass re-establishment" is a conclusion that is predicated on the assumption that the only way that nitrogen affects eelgrass is through phytoplankton blooms that cause shading. In fact, there are several other ways that excess nitrogen can affect eelgrass (see explanation in response to Claim #1). In response to similar comments from the Coalition on the 2012 Consolidated Assessment and Listing Methodology, DES showed that TN accounts for 27% of the variability in light attenuation (see Figure 2) in the tidal rivers and provided the following explanation: "The impairments for light attenuation ("transparency/TN-based listings") cannot be deleted from the 303(d) list because light attenuation is a good indicator of eelgrass survival and there is a statistically significant relationship between light attenuation and total nitrogen in the estuary. The Great Bay Municipal Coalition has argued that light attenuation is naturally occurring and unrelated to nitrogen, especially in the tidal rivers. In the N.H. Surface Water Quality Regulations, "naturally occurring" means conditions which exist in the absence of human influences (Env-Wq 1702.29). Figure 2a shows that light attenuation and total nitrogen have statistically significant relationships in the estuary, including in the tidal rivers (Figure 2b). Total nitrogen concentrations are a strong indicator of human influence. Therefore, given the relationship between light attenuation and total nitrogen in the estuary, including in the tidal rivers, it cannot be justified that light attenuation is "naturally occurring" nor can it be justified that light attenuation is unrelated to nitrogen concentrations." (DES, 2012b at 8) It must also be recognized that eelgrass has been present in New Hampshire's tidal rivers in recent times. The fact that eelgrass has been detected in the tidal portions of the Winnicut, Lamprey, Oyster, Bellamy, and Upper Piscataqua Rivers in recent years (i.e., since 1981 when the first modern comprehensive mapping was conducted) demonstrates that it should be possible to restore eelgrass in these areas (DES, 2012 at 14). The deposition testimony, and invalid conclusions drawn therefrom, are addressed in Appendix B.</p>	<p>Not preserved. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.</p>

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85	V.i	<ul style="list-style-type: none"> <li>A large increase in rainfall and major floods occurring from 2006 (a natural condition) could be the primary cause of significant eelgrass declines that occurred in Great Bay during that period due to increased turbidity and CDOM. DES failed to assess the importance of these events in triggering the eelgrass decline in the system despite the obvious temporal correlation.</li> </ul>	<p>Burack letter dated October 19, 2012 (Ex. 32); NHDES, Response to Public Comment on the Draft 2012 Consolidated Assessment and Listing Methodology (CALM) (Ex. 37); RTC at 104 - 106; RTC at 151 – 160 (Ex. 1).</p>	<p>Each of these issues were addressed by DES in the October 19, 2012 Burack letter: (1) "The actual data for eelgrass in the Great Bay do not support this claim (see Figure 3). The data show a steady decline over time with the 2006-2008 years falling slightly below the regression line and the last three years unchanged and slightly above the line. The odds of this trend occurring by chance are less than 1 in 15,000, which, for such a complicated ecosystem, demonstrates a very robust trend. Eelgrass cover in the entire estuary is still 35% below its extent in 1996 (PREP, 2012 at 126). It is not "rebounding". Even if the 2006-2008 years were disregarded, there would still be a statistically significant declining trend in eelgrass since 1990. Finally, it is not possible that heavy rainfalls in 2006-2008 could have caused the eelgrass declines that were evident in 2005 when DES initiated the study of nitrogen in the Great Bay. DES agrees that changes in CDOM (colored dissolved organic matter), turbidity, and salinity during floods can affect eelgrass. However, another explanation for the worse conditions during heavy rainfall years is that more nitrogen is delivered from the watershed during those years as shown by Figure 4. CDOM itself is organic matter typically exported from wetlands in the watershed. Organic matter necessarily contains a certain fraction of nitrogen. Therefore, CDOM is not an independent parameter from nitrogen. Moreover, delivery of nitrogen from human sources in the watershed is not a "natural process"; (2) DES protocols for assessing eelgrass populations for the 303d report use eelgrass data from all years and look at trends over the full period of record and averages from the most recent three years (DES, 2012 at 67). Multiple years are used to make assessments to account for year-to-year variability in weather and other factors. It is not clear what is meant by the statement: "DES failed to assess the importance of these events". As stated above, even if the presumed wet years of 2006-2008 were disregarded, there would still be a statistically significant declining trend in eelgrass since 1990. The deposition testimony, and invalid conclusions drawn therefrom, are addressed in Appendix B.</p>	<p>Not preserved. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.</p>
85	V.i	<ul style="list-style-type: none"> <li>Available historical data and recent eelgrass regrowth in the system since 2008 which increased by 40% in areal coverage, indicate that the transparency level chosen to establish the 2009 numeric criteria is not necessary to support eelgrass growth and reestablishment in Great Bay, Little Bay and Lower Piscataqua River.</li> </ul>	<p>PREP Draft Data Report (July 16, 2012) (Ex. 36)</p>	<p>There is no admission by Mr. Trowbridge in the deposition that eelgrass regrowth in certain areas "indicates that the transparency level chosen to establish the 2009 numeric criteria is not necessary to support eelgrass growth and reestablishment in Great Bay, Little Bay, and the Lower Piscataqua River. It is unclear how the Coalition is calculating a 40% increase in areal coverage since 2008. In 2008 the eelgrass acreage in Great Bay proper was 1394.9 acres and 1623.2 acres in 2011. This is a 14.1% increase in areal extent. For the estuary as a whole the acreage in 2008 was 1626.3 acres and 1890.7 acres in 2011. This is a 14% increase in aerial extent. While there has been an increase in aerial extent of eelgrass, a significant concern is the steady decline in eelgrass biomass in the estuary. In Great Bay proper the eelgrass density fell from 609.1 to 382.8 metric tons from 2008 to 2011. In Portsmouth Harbor biomass fell from 55 to 43.2 metric tons. EPA does acknowledge that biomass in Little Bay has risen from 0 to 13 metric tons from 2008 to 2011. It also needs to be noted that eelgrass is still absent from the Lower Piscataqua River North and the tidal tributaries (with the exception of the Lamprey River which had 0.5 acres of eelgrass in 2011.)</p>	<p>Not preserved. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record.</p>
86	V.i	<ul style="list-style-type: none"> <li>No site-specific research has been completed to evaluate the cause of more recent eelgrass declines anywhere in the Great Bay system. To date, the causes of such eelgrass declines remain unknown.</li> </ul>	<p>NHDES 2009 Nutrient Criteria Report (Ex. 43); USEPASAB Stressor-Response Review, April 27,</p>	<p>In its review of the deposition transcript EPA failed to find a statement or acknowledgement by Mr. Trowbridge that "No site-specific research has been completed to evaluate the cause of more recent eelgrass declines anywhere in the Great Bay system. To date, the causes of such eelgrass declines remain unknown." It is unclear what the Coalition specifically means by this</p>	<p>Not preserved as to deposition testimony. Mischaracterizes and/or ignores portions of the record, including EPA's responses</p>

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			2010 (Ex. 52); RTC at 111; RTC at 112 - 114; RTC at 74 - 78; RTC at 61 - 65; RTC at 41 - 45; RTC at 107 (Ex. 1); Petitioner Exhibit 12, Trowbridge Depo at 377-79; see also id. at 255-57.	statement, although Mr. Trowbridge’s testimony clearly indicates that he believes the Coalition is seeking a controlled laboratory experiment to prove causation. Trowbridge Deposition at 377-79 (“I think we’re, again, at this issue of can you prove causation at a specific location. . . Again, in terms -- if the burden of proof is to prove causation, since we do not have a control Great-Bay where we can run an experiment with or without macroalgae or with our without nitrogen, we don’t have that information.”). There has been extensive monitoring throughout the estuary showing strong correlations between TN and water quality parameters and other lines of evidence in the DES weight of evidence approach which support the nitrogen thresholds in the Great Bay Nutrient Report.	to comments, and therefore fails to substantively confront EPA’s response, which was rational in light of the entire record. Lacks specificity necessary for Board review because merely restates claim. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA’s part.
86	V.i	<ul style="list-style-type: none"> <li>The various DES analyses that confirmed (1) TN increases did not cause changes in transparency, algal levels or DO and (2) a "cause and effect" relationship between TN and transparency/DO did not exist, were excluded from the technical information presented in the 2009 Numeric Criteria document and, therefore were never presented to EPA’s internal peer review.</li> </ul>	NHDES 2009 Nutrient Criteria Report; USEPASAB Stressor-Response Review, April 27, 2010 (Ex. 52); RTC at 111; RTC at 112 - 114; RTC at 74 - 78; RTC at 61 - 65; RTC at 41 – 45 (Ex. 1).	The October 19, 2012 Burack letter explains that estuaries are complicated systems and that the NHDES undertook a 5 year effort with the inclusion of a technical advisory committee to explore nutrient related concerns in the Great Bay Estuary. The Burack letter clearly states that initial methods and data sets were inadequate to show simple relationships between nitrogen and transparency, phytoplankton, or dissolved oxygen. Approaches later employed by DES used long-term averages to take into account delays in the biological response and nonlinear feedback in a complicated estuarine system. This approach was used in NHDES 2009 Great Bay Nutrient Report and was able to show the relationships between nutrients and their effects. As was appropriate, the initial analyses performed at the beginning of the DES effort were not included in the final report. Additionally, as explained in the RTC, the relationships pointed out by the Coalition are part of weight of evidence approach that was utilized by the DES in the development of the 2009 Great Bay Nutrient Report. The SAB has identified the stressor-response approach as a legitimate, scientifically based method for developing numeric nutrient criteria is the approach is appropriately applied (i.e. not used in isolation but at part of a weight of evidence approach).	Not preserved as to deposition testimony. Mischaracterizes and/or ignores portions of the record, including EPA’s responses to comments, and therefore fails to substantively confront EPA’s response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA’s part.
86	V.i	Either way, it is arbitrary and capricious for an agency to rely on a document whose own author has admitted is flawed. <i>See Texas Oil &amp; Gas Ass’n v. United States EPA</i> , 161 F.3d 923, 935 (5th Cir. 1998) (“When an agency adopts a regulation based on a study [that is] not designed for the purpose and is limited or criticized by its authors on points essential to the us sought to be made of it the administrative action is arbitrary and capricious and a clear error in judgement.”) ( <i>quoting Humana of Aurora, Inc. v. Heckler</i> , 753 F.2d 1579, 1583 (10th Cir. 1985) <i>cert. denied</i> , 474 U.S. 863(1985)). Consequently, EPA’s reliance on the 2009 Numeric Criteria was clear error.	NHDES 2009 Nutrient Criteria Report (Ex. 43); USEPASAB Stressor-Response Review, April 27, 2010 (Ex. 52); RTC at 111; RTC at 112 - 114; RTC at 74 - 78; RTC at 61 - 65; RTC at 41 – 45 (Ex. 1); Burack letter dated October 19, 2012 (Ex. 32).	Nowhere has Mr. Trowbridge admitted the 2009 Great Bay Nutrient Report is flawed.	Not preserved as to deposition testimony. Mischaracterizes and/or ignores portions of the record, including EPA’s responses to comments, and therefore fails to substantively confront EPA’s response, which was rational in light of the entire record. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA’s part. .
87	V.j	<b>j. EPA’s use of the Peer review violated the Coalition’s Due Process Rights and CWA Mandatory Duties</b>			
87	V.j	The Coalition repeatedly requested to be a part of the peer review process to ensure tht appropriate technical questions prepared the the Coalition were addressed but EPA ignored such	RTC at 61 – 65 (Ex. 1). NHDES 2009 Great Bay Nutrient Report (Ex. 43).	While there is no requirement of proposed state criteria to be peer reviewed, EPA elected to subject the proposed numeric thresholds to such a process in an effort to provide greater assurance to the public and regulated community as to the scientific and technical basis for the	Mischaracterizes the record, including EPA’s responses to the Coalition’s comments, and

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		requests and refused to even submit the Coalition's questions to the peer reviewers.		thresholds. The material provided to the peer reviewers included copies of comments received by NHDES on the proposed numeric thresholds document. The peer review process is designed to draw "independent, expert information and in-depth analysis" regarding limited specified technical issues while a public comments is open to any interested party who wishes to comment on any issue. EPA may, at its discretion, choose whether or not to include a public participation component within the peer review process.	therefore fails to substantively confront EPA's response. Lacks specificity necessary for Board review because merely restates claim. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
87	V.j	EPA compounded this violation by refusing to consider the points raised in objection to the peer review scope and content as part of these permit comments. This action and the original exclusion from the peer review expressly violated Section 101(e) of the Act. This is in plain error that must be remedied before EPA can rely, in any form on the alleged comprehensive peer review.	RTC at 61 – 65 (Ex. 1). NHDES 2009 Great Bay Nutrient Report (Ex. 43).	EPA may, at its discretion, choose wither or not to include a public participation component within the peer review process. Additionally, EPA was under no obligation to have the peer review performed. Timely comments concerning the scope of the peer review process were addressed in the final Response to Comments document.	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. Lacks specificity necessary for Board review because merely restates claim. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
87	V.j	Moreover, the data excluded from the peer review (as feared by the coalition) biased that analysis rendering the document useless for permit decision making.....[Therefore,] as the peer reviewers were purposefully not given the opportunity to review all relevant information relating to the adoption of the 2009 Numeric Criteria document (information showing the approach was, in fact, misplaced), they could not render an objective, unbiased decision on the scientific defensibility of such document. Consequently, any reliance on such document would be <i>per se</i> arbitrary and capricious and clear error.	RTC at 61 – 65 (Ex. 1). NHDES 2009 Great Bay Nutrient Report (Ex. 43). Burack letter dated October 19, 2012 (Ex. 32).	While there is no requirement for proposed state criteria to be peer reviewed, EPA elected to subject the proposed numeric thresholds to such a process in an effort to provide greater assurance to the public and regulated community as to the scientific and technical basis for the thresholds. The material provided to the peer reviewers included copies of comments received by NHDES on the proposed numeric thresholds document. The peer review process is designed to draw "independent, expert information and in-depth analysis" regarding limited specified technical issues while a public comments is open to any interested party who wishes to comment on any issue. The peer review process should be transparent and available to the public but it is a review by independent technical experts and consistent with the guidance, it should not allow parties supported the proposed criteria or opposing the proposed criteria to influence the process. EPA may, at its discretion, choose whether or not to include a public participation component within the peer review process. The 2009 Great Bay Nutrient Report was the culmination of years of work. Early in the process, data did not show simple relationships between TN and transparency, phytoplankton, or DO. The methods first employed were inadequate for this task. The final report adopted an approach that used long-term averages to take into account delays in the biological response and nonlinear feedback in a complicated estuarine system. This approach showed the relationship between TN and effects in the estuary. The initial analyses were not included in the report, as appropriate.	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. Lacks specificity necessary for Board review because merely restates claim. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.

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87	V.j	Footnote 76 - EPA's response to comments artfully says prior comments from the communities on the 2009 Numeric Criteria document were given to the peer review. However, it was not until after that time the Coalition hired experts to evaluate the basis of that DES decision and discovered various errors in the analysis. Thus, EPA has excluded from consideration any comments or issues raised since June 2009 as part of this permit action. That is a grossly improper procedural error as the 2009 Numeric Criteria document is not some sort of infallible and irrefutable regulatory decision.	RTC at 61 – 65 (Ex. 1). NHDES 2009 Great Bay Nutrient Report (Ex. 43). Burack letter dated October 19, 2012 (Ex. 32).	As stated above, the peer review of the proposed thresholds was discretionary and EPA had it done. There is no requirement to have public participation in the peer review process but EPA did include initial public comments on the 2009 Great Bay Nutrient Report, including those from the Coalition, to the peer reviewers. Early analyses which did not show relationships between TN and estuarine effects were appropriately not included in the final report because the initial methods were replaced with those that could illustrate the underlying relationships between TN and estuarine effects. The assertion that EPA has excluded from consideration any comments or issues raised since June 2009 as part of this permit action is categorically false. All timely comments received by the Coalition were addressed in the final Response to Comments document dated November 15, 2012. For example, the June 30, 2010 Evaluation of Proposed Numeric Nutrient Water Quality Criteria for the Great Bay Estuary prepared by John c. Hall and Thomas Gallagher as well as the January 10, 2011 HydroQual Technical Memorandum - Review of New Hampshire DES Total Nitrogen Criteria Development for the Great Bay Estuary were both addressed in the final Response to Comments document where issues within these documents were raised in the timely comments on the draft permit.	Not preserved as to deposition testimony. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review because merely restates claim. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
88	V.k	<b>k. Weight of evidence assessment was procedurally and substantively flawed</b>			
88	V.k	EPA allegedly based its decision that narrative criteria violations existed and stringent nitrogen requirements were the solution based upon a "weight of evidence" analysis. EPA expressly stated on a number of occasions that such analyses are allowable for narrative criteria interpretation and derivation of necessary permit requirements without actually making any cause-and-effect demonstration that the pollutant at issue was in fact responsible for the alleged impairment found in the receiving water. (RTC at 57). To this end EPA stated it was allowable to rely on mere correlations as the basis for asserting that nitrogen was the cause of certain impairments so long as the type of adverse effect being regulated has been found in out estuaries, e.g. Chesapeake Bay and some Massachusetts bays. ( <i>Id.</i> at 72).	RTC at 57 - 59; RTC at 72 (Ex. 1).	The petition mischaracterizes the threshold for including an effluent limitation. 40 CFR 122.44(d)(i) states that limitations must control all pollutants which "are or may be discharged at a level which will cause, <i>have the reasonable potential to cause, or contribute</i> to an excursion above any State water quality standard, including State narrative criteria for water quality." (emphasis added) In determining the reasonable potential to cause or contribute to an excursion about the State narrative criteria, EPA considered site specific data from the Great Bay Estuary as well as thresholds developed for water bodies in other states and information from scientific literature. With respect to nitrogen thresholds from other estuarine systems were considered as part of a weight of evidence approach and as a check on the thresholds established using site specific data. EPA did not automatically apply nutrient criteria from other states but considered them as part of the total mix of information. This is consistent with 40 CFR 122.44(d)(1)(vi) which indicates that relevant information can be used in interpreting a narrative criteria.	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. Lacks specificity necessary for Board review because it restates claim and makes mere allegations of error. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
88	V.k	The Coalition stated that a weight of evidence approach cannot substitute for a reasonable cause-and-effect demonstration based on the data from the water body being actually regulated, as required by the narrative standard. In short, that one may not rely on generalizations and vague correlations in asserting violations of the CWA have occurred and certain permit limitations costing in excess of a billion dollars throughout the watershed must be implemented. The Coalition also noted that even if a weight of evidence approach could be allowed, that weighting the evidence required the fair and objective consideration of <i>all the evidence</i> that both supports and detracts from the position being asserted. EPA's weight of evidence analysis did not - it only considered supporting evidence and	RTC at 57 – 59 (Ex. 1).	The petition mischaracterizes the threshold for including an effluent limitation. 40 CFR 122.44(d)(i) states that limitations must control all pollutants which "are or may be discharged at a level which will cause, <i>have the reasonable potential to cause, or contribute</i> to an excursion above any State water quality standard, including State narrative criteria for water quality." (emphasis added) In determining the reasonable potential to cause or contribute to an excursion above the State narrative criteria, EPA considered site-specific data from the Great Bay Estuary as well as thresholds developed for water bodies in other states and information from scientific literature. The suggestion that EPA based its permitting determinations on generalizations and vague correlations is incorrect. EPA relied in part on Section 303(d) impairment listings but also considered site specific information from the Great Bay Estuary and peer reviewed scientific information in the literature concerning the relationship between nitrogen and estuarine effects. The assertion by the Coalition that EPA "only considered supporting evidence and ignored all contradicting information" is false.	Mischaracterizes and/or ignores the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. Lacks specificity necessary for Board review because it makes mere allegations of error. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.

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		ignored all contradicting information. That was clear error.		Throughout the response to comments and within this document EPA has addressed information presented by the Coalition and has not been convinced that the relationship between nitrogen concentrations and declining conditions within the Great Bay Estuary are not linked and that appropriate effluent total nitrogen limitations for the Newmarket POTW are not appropriate to ensure attainment with the State of New Hampshire’s narrative water quality standard.	
89	V.k.i	<b>i. Prior DES studies Showing No Transparency Relationship were improperly Excised from Record</b>			
89	V.k.i	When EPA developed its weight of evidence approach with DES all of the site specific information confirming that nitrogen had never caused any material change in water-column transparency was eliminated from the record developed by EPA. This was verified in deposition (Exhibit 15) and confirmed by Commissions Burack’s October 19, 2012 letter. EPA’s failure/refusal to give appropriate weight (controlling weight) to the actual site specific information was a fundament flaw as stated by the SAB.		The assertion that EPA excluded or did not give weight to site specific information showing that the relationship between nitrogen and water column transparency did not in fact exist is plainly false. While page 2 footnote 1 of the response to comments refers to the nine sets of supplemental comments submitted by the Coalition (eight or which were filed 8 to 11 months after the close of the public comment period) and the fact that the EPA rejects these comments as untimely and does not respond to them in the response to comments document, these comments have been incorporated into the administrative record. Throughout the response to comments and within this document EPA has addressed information presented by the Coalition and has not been convinced that the relationship between nitrogen concentrations and declining conditions within the Great Bay Estuary are not linked and that appropriate effluent total nitrogen limitations for the Newmarket POTW are not appropriate to ensure attainment with the State of New Hampshire’s narrative water quality standard. The October 19, 2012 Burack letter does not confirm that any analyses were eliminated from the record. Rather this letter explains that estuaries are complicated systems and that the NHDES undertook a 5 year effort with the inclusion of a technical advisory committee to explore nutrient related concerns in the Great Bay Estuary. The Burack letter clearly states that initial methods and data sets were inadequate to show simple relationships between nitrogen and transparency, phytoplankton, or dissolved oxygen. Approaches later employed by DES used long-term averages to take into account delays in the biological response and nonlinear feedback in a complicated estuarine system. This approach was used in NHDES’ 2009 Great Bay Nutrient Report and was able to show the relationships between nutrients and their effects. As was appropriate the initial analyses performed at the beginning of DES’ effort were not included in the final report. The deposition testimony, and the invalid conclusions drawn therefrom, are addressed in <i>Appendix B</i> .	Not preserved as to deposition testimony. Mischaracterizes and/or ignores portions of the record, including EPA’s responses to comments, and therefore fails to substantively confront EPA’s response, which was rational in light of the entire record. Lacks specificity necessary for Board review because merely restates claim. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA’s part.
89	V.k.ii	<b>ii. EPA Ignored Relevant Science Advisory Board Findings that Confounded Correlations are not a Scientifically Defensible Basis for Criteria Assessment</b>			
90	V.k.ii	EPA response on this issue is clear error. First and foremost, simply invoking the term "weight of evidence" does not render the particular analysis sufficient to demonstrate that a use impairment has occurred due to nitrogen or that the nitrogen target used to remedy that impairment is sufficiently justified. It is true that the Coalition acknowledge that a weight of evidence	RTC at 74 - 78; RTC at 111; RTC at 112 – 114 (Ex. 1).	The weight of evidence approach utilized is clearly supported by the SAB. In its review the SAB stated "The Stressor-Response approach is a legitimate, scientifically based method for developing numeric criteria is the approach is applied correctly (i.e. not used in isolation but as part of a weight-of-evidence approach. The proposed numeric thresholds developed by NHDES did not use the stressor-response in isolation. As recommended by the SAB it used the stressor response approach as part of a multiple lines of evidence. In addition to the stressor response	Not preserved as to deposition testimony. Mischaracterizes and/or ignores portions of the record, including EPA’s responses to comments, and therefore fails to substantively confront EPA’s

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		approach may be appropriate however this is no way implied <i>the</i> weight of evidence approach originally developed by DES in 2009 and employed by EPA was scientifically defensible.		approach, DES utilized the estuarine eutrophication model used by NOAA (Bricker, 2007) relating external nutrients to primary and secondary symptoms as a guide for the analysis. Additionally, the NHDES assessed cause and effect data from the literature, criteria developed in other states, and a reference concentration approach (utilizing Portsmouth Harbor and Little Harbor as reference sites although not pristine due to declines in eelgrass acreage at these locations) in the development of its proposed numeric thresholds.	response, which was rational in light of the entire record. Lacks specificity necessary for Board review because merely restates claim. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
90	V.k.ii	Secondly, the SAB noted that the weight of evidence requires an evaluation of the uncertainties underlying the presumed generalized relationship (See Exhibit 1). This requires a consideration of whether the site-specific information available for the water body shows whether a relationship exists. Rather than evaluating the degree to which the relationship existed and assessing the certainty or lack thereof of the relationship considering the site specific information, EPA simply excluded the site-specific information showing that the relationship did not in fact exist. (See RTC at 2 n.1; Exhibit 15 at 9 - 10)	Petitioner Exhibit 1 (original comments from Coalition dated 12/15/11); RTC at 2 n.1 (Ex. 1); Petitioner Exhibit 15 at 9 - 10 (supplement comments from Coalition dated 8/30/12); RTC at 109 - 110; RTC at 111; RTC at 112 - 114 (Ex. 1). Burack letter dated October 19, 2012 (Ex. 32).	The assertion that EPA excluded site specific information showing that the relationship did not in fact exist is plainly false. While page 2 footnote 1 of the response to comments refers to the nine sets of supplemental comments submitted by the Coalition (eight of which were filed 8 to 11 months after the close of the public comment period) and the fact that the EPA rejects these comments as untimely and does not respond to them in the response to comments document, these comments have been incorporated into the administrative record. Throughout the response to comments and within this document EPA has addressed information presented by the Coalition and has not been convinced that the relationship between nitrogen concentrations and declining conditions within the Great Bay Estuary are not linked and that appropriate effluent total nitrogen limitations for the Newmarket POTW are not appropriate to ensure attainment with the State of New Hampshire's narrative water quality standard.	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. Lacks specificity necessary for Board review because it makes mere allegations of error. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
90	V.k.ii	Finally, EPA's FOIA response issued for each of the permittees confirmed that none of the uncertainty analyses or confounding factors evaluation required by the SAB to confirm the analysis is scientifically defensible was ever performed with respect to the 2009 Numeric Criteria (including the effect of the habitat and hydrology on the system response to nitrogen inputs) thereby rendering the 2009 Numeric Criteria analyses little more than unsupported speculation. On this basis it is clear that the EPA's assertion that the "weight of evidence" analysis to demonstrate the nitrogen had caused transparency declines and eelgrass losses in this system was a complete and utter fabrication.	FOIA responses; NHDES 2009 Great Bay Nutrient Report (Ex. 43); Newmarket Fact Sheet (Ex. 2); RTC at 111 - 114; RTC at 159 - 160; RTC at 72; RTC at 74 - 79; RTC at 109 - 110; RTC at 111 (Ex. 1).	In determining the reasonable potential to cause or contribute to an excursion above the State narrative criteria, EPA considered site specific data from the Great Bay Estuary as well as thresholds developed for water bodies in other states and information from scientific literature. The suggestion that EPA based its permitting determinations on generalizations and vague correlations is incorrect. EPA relied in part on Section 303(d) impairment listings but also considered site specific information from the Great Bay Estuary and peer reviewed scientific information in the literature concerning the relationship between nitrogen and estuarine effects. This is clearly consistent with 40 CFR 122.44(d)(1)(vi).	Not preserved as to deposition testimony. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review because merely restates claim. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
91	V.k.ii	Moreover, the fact that EPA's permit and the 2010 Peer Review, was conducted <i>after</i> the SAB issued its final findings in April 2010 that certain weight of evidence approaches are not scientifically defensible, does not mean that EPA properly addressed the admonitions of the SAB. EPA nowhere shows that this weight of evidence approach employed by DES meets any of the prerequisites outlined by the SAB and contained in EPA's subsequently issued stressor-response criteria guidance document. Simply claiming that the peer review was conducted	RTC at 61 - 65; RTC at 74 - 78; RTC at 111; RTC at 112 - 114 (Ex. 1).	The peer reviewers, Robert W. Howarth and Water R. Boynton, are world renowned experts in the field of estuarine science. According to Mr. Howarth, "The author makes clear at the start that the development of the TN criteria uses a weight of evidence approach. Given the "state of the art" in estuarine science I think this is a very reasonable approach. In addition, the author used multiple analyses in many portions of this work and that provides enhanced confidence in the results. Simply said, this is a good approach to use in system as complicated and variable as estuaries." Mr. Howarth further notes, "The analysis is very empirical. That is, it is based on local measurements....quite a pile of local measurements made at many sites during a 9 year period. In addition, there is good reference to appropriated scientific literature	Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. Lacks specificity necessary for Board review because it makes mere allegations of error. At most, it is a bona fide difference of

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		after the SAB recommendations were available does not mean that the peer review considered those recommendations and is therefore scientifically defensible. In fact, it is perfectly clear from the peer review response documents that the critical analyses the SAB indicated must be conducted were never assessed in that review.		and to adjacent estuarine areas. I think that this was a well grounded analysis." Given the technical expertise of both Mr. Howarth and Mr. Boynton, it would be expected that if the fatal errors the Coalition assert are present would have been noted by these highly regarded estuarine experts.	technical opinion that does not demonstrate clear error on EPA's part.
91	V.k.ii	EPA's assertions that its weight of evidence approach conforms with SAB's requirement and later issued EPA guidance is a conclusory statement that is demonstrably incorrect based upon the record before the Board. Therefore, as the "weight of evidence" analysis was a plainly deficient, both procedurally (failing to consider SAB admonitions) and substantively (failing to account of any of the relevant confounding factors), EPA's acceptance of the DES documents as a scientifically defensible basis for establishing TN limitations was clear error.	RTC at 61 - 65; RTC at 74 - 78; RTC at 111; RTC at 112 - 114 (Ex. 1).	NHDES Great Bay Nutrient Report correctly uses the stressor-response approach as part of a weight-of-evidence approach for criteria development. EPA and DES have acknowledged that the stressor-response relationships show correlations and not cause and effect. However, when combined with a weight of evidence approach that included thresholds for macroalgae proliferation, regressions between total nitrogen and the light attenuation coefficient, offshore water background concentrations, reference concentrations in areas of the estuary which still support eelgrass (although not pristine), and the thresholds that have been set for other New England estuaries, it is clear that the total nitrogen thresholds developed by NHDES are scientifically defensible. As outlined in the RTC at 111 - 114 confounding factors such as flushing time, freshwater flow stratification, turbidity, and CDOM were considered.	Not preserved as to deposition testimony. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review because merely restates claim. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.
92	V.I	<b>I. EPA's Action fails the Daubert Test</b>			
92	V.I	DES, the author of the 2009 Numeric Criteria document, has admitted that the central analysis used to select the "necessary" and "protective" numeric criteria for the system is based on nothing more than correlation. E-mails to and from EPA at the time the criteria document was developed acknowledged this fact. (Exhibit 2 at 2-3). Despite this acknowledged DES misinformed the public and the peer review in its response to comments that the graphs at issue in fact prove causation a clearing misstated position (See 2009 Criteria 79, Appx B-4). It is not accepted within the scientific community that stressor-response analyses used to identify numeric criteria, be based on mere correlations. (See Stressor-Response Guidance). EPA's SAB has stated this position because the resulting regulatory analyses maybe highly in error: "In order to be scientifically defensible, empirical methods must take into consideration the influence of other variables.... The statistical methods in the Guidance require careful consideration of confounding variables before used as predictive tools.... <b>Without such information nutrient criteria developed using bivariate methods may be highly inaccurate.</b> " (USEPASAB Stressor-Response Review - April 27, 2010).	NHDES 2009 Nutrient Criteria Report (Ex. 43); May 4, 2012 Scientific Misconduct Letter (Petitioner Exhibit 2); USEPASAB Stressor-Response Review, April 27, 2010 (Ex. 52); RTC at 111; RTC at 112 - 114; RTC at 74 - 78; RTC at 61 - 65; RTC at 41 - 45 (Ex. 1).	The comment takes "admissions" regarding the 2009 Numeric Criteria document completely out of context. The DES utilized a weight of evidence approach of which the stressor-response correlations were a part. As stated on page 15 of the document "The nitrogen threshold for the protection of eelgrass was derived using a weight-of-evidence approach which included the thresholds for macroalgae proliferation, regressions between total nitrogen and the light attenuation coefficient, offshore water background concentrations, reference concentrations in areas of the estuary which still support eelgrass, and the thresholds that have been set for other New England estuaries." This is entirely consistent with the SAB review where it states "The stressor response approach is a legitimate, scientifically based method for developing numeric nutrient criteria if the approach is appropriately applied (i.e. not used in isolation but as part of a weight of evidence approach)." Exhibit 2 at 2-3 appears to refer to an e-mail generated by Matt Liebman of EPA - Region I. In this e-mail Mr. Liebman warns of the use of the word "causal" because the data are correlations. This is simply a clarification of how things should be viewed. The e-mail goes on to say "So, we should stress that even though the data are correlative, because of the strong relationships exhibited in the data, and because many components of the conceptual model seem to be corroborated, it is very likely that nitrogen strongly contributes to turbidity in the water column, resulting in impacts to eelgrass." The issue of confounding variables is addressed in the Response to Comments at 112 - 114. Flushing time, freshwater inflow, and stratification effects are all reflected in the extensive data set utilized by DES in the NHDES Great Bay Nutrient Report.	Not preserved as to testimony. Mischaracterizes the record, including EPA's responses to the Coalition's comments, and therefore fails to substantively confront EPA's response. Lacks specificity necessary for Board review. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.

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92	V.I	<p>Footnote 80 - It should be further noted, that EPA presentation of low DO frequency in the Lamprey River (see RTC at 104) is on its face a deficient analysis. While this figure shows the frequency of low DO has varied widely year to year, EPA provides no information regarding the degree of Chl 'a' present in the system year to year to verify that the reasons why the DO changed was directly a result of change in Chl 'a' levels and the nitrogen influence on those levels. The Coalition asserts that the reason this information was not presented is obvious. The actual data shows the opposite for example, the year with the least amount of DO violations was 2006. That however, is the year with the greatest nitrogen loading to the Lamprey River. See Burack 2012 Letter, Figure 4. However, this would also be the year with the lowest algal levels occurring in the Lamprey River because of the enormous freshwater flows reducing the detention time in the system which would also concurrently reduce stratification in the system. Thus it is apparent EPA's entire regulatory theory is completely and utterly in error. There is no algal/TN/low DO relationship present in the tidal rivers, nor has it been demonstrated in another tidal river as confirmed by the deposition testimony of the author of the 2009 Numeric Criteria Document - testimony that EPA ignored and has left out of this record on review (Exhibit 2 at 10).</p>	<p>Burack letter dated October 19, 2012 (Ex. 32); RTC at 102 - 105; RTC at 94 – 96 (Ex. 1).</p>	<p>As the Coalition points out, it is entirely expected that in 2006 the number of DO violations and chl 'a' concentrations would both be low due to the high flows in the Lamprey River even though the amount of nitrogen entering the system (because of the high flows) would be high. However, it is unclear how the Coalition translates this into a lack of nitrogen/chlorophyll-a/DO relationship. Long term trend monitoring from the tidal rivers, including the Lamprey River, are part of a statistical analysis performed by NHDES in connection with the proposed numeric thresholds showing a statistically significant relationship between minimum DO and 90th percentile chl 'a' (Figure 27 in the NHDES 2009 Great Bay Nutrient Report). Data from station NH-0025A at the mouth of the Lamprey River is fully consistent with the overall trend. EPA has acknowledged that stratification in the Lamprey River can lead to low DO as reported in the 2005 of the river performed by Dr. Jonathan Pennock of UNH. While Pennock (2005) does state, "The vertical profiles taken during the surveys do suggest that there is a significant stratification in the upper reached of the tidal portion of the Lamprey River," the study also states, "These results suggest that low dissolved oxygen is a concern for the upper tidal reaches of the Lamprey River. Whether this is a long-term (and natural?) characteristic of this system or whether human perturbation (e.g. historic dam building, dredging/deepening of the basin, enrichment of oxygen consuming organic or inorganic runoff/water, etc...) would require a detailed study of the biological and chemical demand in the system." Also, the dataset reported in Pennock report did not include chlorophyll-a or other measures of algal growth and the Pennock report does not mention algae or chlorophyll-a. Indeed, on two of the sampling dates for this study (August 12, 2004 and October 26, 2004), the data sonde in the Lamprey River shows periods of dissolved oxygen supersaturation which is indicative of excessive algal growth. (Pennock, 2005 at Figures 4 and 5). So, while stratification in this system is an issue, high levels of nitrogen causing algal blooms also affect dissolved oxygen concentrations as well. Finally, the DES 2009 Great Bay Nutrient Report summarizes (among other parameters) total nitrogen concentrations and chl 'a' concentrations from 2000 - 2008. The mean TN concentration is 0.451 mg/l with a range of 0.265 - 0.97 mg/l. Chl 'a' had a mean of 3.12 ug/l, a range of 0.33 to 145.45 ug/l, and a 90th percentile of 12.4. The 90th percentile chl 'a' is among the highest in the estuary, and the maximum of 145.45 is the highest recorded value in the estuary for the period of 2000 - 2008. These chl 'a' are clearly in excess of recommended values and result from excessive nutrient loading (i.e. TN) into the system.</p>	<p>Not preserved as to deposition testimony. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review because merely restates claim. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.</p>

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93	V.I	<p>Moreover, the Coalition noted that the analysis was fundamentally flawed because areas with radically different ecological settings - tidal rivers, Great Bay, mouth of the harbor - were plotted on the same chart without any analysis of the relevant factors influencing nitrogen impacts and other related factors influencing transparency (or DO) at these different locations. There is no treatise or EPA guidance manual that indicates such an assessment is scientifically defensible or in any way accepted in the scientific community. In fact in April 2010 EPA's SAB has expressly stated the opposite - that only similar ecological setting should be evaluated when developing nutrient criteria and conducting stressor/response analyses based on empirical evidence. "For Criteria that meet EPA's stated goal of "protection against environmental degradation by nutrients," the underlying causal models must be correct. <b><u>Habitat condition is a crucial consideration in this regard (e.g., light [for example canopy cover], hydrology, grazer abundance, velocity, sediment type) that is not adequately addressed in the Guidance.</u></b> Thus, a major uncertainty inherent in the guidance is accounting for factors that influence biological responses to nutrient inputs. <b><u>Addressing this uncertainty requires adequately accounting for these factors in different types of water bodies.</u></b>" (SAB at 36,37) <b><u>"Numeric nutrient criteria developed and implemented without consideration of site specific conditions can lead to management actions that may have negative social and economic and unintended environmental consequences without additional environmental protection.</u></b>" (at 37) EPA itself has put out different guidance manuals for rivers, lakes (bays) and estuaries because of the need to consider the effects of such different settings on nutrient impacts and criteria assessment. None of these documents indicate it is acceptable to plot data from these different settings on the same chart to predict the impact of nitrogen or another nutrient.</p>	<p>RTC at 111; RTC at 112 – 114 (Ex. 1); NHDES, Response to Public Comment on the Draft 2012 Consolidated Assessment and Listing Methodology (CALM) (Ex. 37).</p>	<p>The Coalition's assertions that the DES analysis is "fundamentally flawed" because areas with "radically different" ecological settings were plotted on the same chart without any analysis of the relevant factor influencing nitrogen impacts and other related factors influencing transparency (or DO) is clearly false. As outlined in the Response to Comments at 112 – 114, flushing time, freshwater inflow, and stratification effects are all reflected in the extensive data set utilized by DES in the NHDES Great Bay Nutrient Report. NHDES properly considered the full data set that had been collected throughout the Great Bay Estuary. There is no reason to believe that the general physiology of eelgrass and ecosystem responses to elevated nitrogen would vary within the estuary. Certainly, the hydrologic conditions vary within the estuary and the NHDES analysis encompasses a range of hydrologic conditions. This range unquestionably is one of the factors that lead to the variability in the data. Despite this variability, a significant correlation still exists. Additionally, more recent analyses conducted by NHDES documented the relationship between light attenuation and increasing nitrogen concentrations in the Great Bay Estuary, even when evaluating areas of the estuary separately. The same relationship is evident between total nitrogen and algae growth.</p>	<p>Not preserved as to deposition testimony. Mischaracterizes and/or ignores portions of the record, including EPA's responses to comments, and therefore fails to substantively confront EPA's response, which was rational in light of the entire record. Lacks specificity necessary for Board review because merely restates claim. At most, it is a bona fide difference of technical opinion that does not demonstrate clear error on EPA's part.</p>
95	V.m.	<p><b>m. EPA's Response to Comments confirms 3 mg/l TN limit is insufficient to ensure compliance</b></p>			
95	V.m.	<p>First, the TN criteria presumes 100% of the effect on DO and transparency is TN-induced. The data plainly shows this is false and EPA has admitted this fact. Therefore, the limits as structured will not assure criteria compliance as required by 40 C.F.R. § 122.44(d).</p>	<p>NHDES 2009 Great Bay Nutrient Report at 1 – 8, 30 – 36, 45 – 54 (Ex. 43); RTC at 83 – 96, 102 – 104 (AR. B.1.)</p>	<p>The Coalition's claim that the TN criteria "presumes 100% of the effect on DO and transparency is TN-induced" is incorrect. As outlined in the Great Bay Nutrient Report, the criteria were based upon statistically significant relationships between TN and various response parameters. These relationships were utilized within the multiple lines of evidence employed by the NHDES in developing nutrient thresholds for the Great Bay Estuary.</p>	<p>Not preserved. Mischaracterizes the record.</p>

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95	V.m.	Second, EPA has indicated that DES must implement stringent nonpoint source control measures to allow the Newmarket permit to have a 3 mg/L effluent limit. Newmarket only constitutes at most 15% of the load to the Lamprey River. 85% of the load comes from unregulated sources upstream in the watershed. The vast majority of these sources are either natural or not regulated under the CWA. (See RTC at 135-138.).	NHDES 2010 Load Reduction Report, Appendix C at Table 3 (Ex. 42); RTC at 17 – 21, 23 – 30 (Ex. 1).	The contribution of the Newmarket POTW to the Lamprey River nitrogen load ranged from 12 to 17 percent on an annual basis during the 2003-08 period analyzed in the NHDES Loading Reduction Report and will be higher than that during the summer lower flow months. The remaining load is from both regulated stormwater point sources and unregulated sources, with the majority from sources that are not subject to CWA NPDES permitting requirements. As clearly outlined in the Response to Comments, in order for water quality standards to be met an effluent limitation of 3 mg/l is necessary in conjunction with nonpoint source reductions in each of the watersheds draining to the Great Bay Estuary.	Not preserved. Mischaracterizes the record.
95	V.m.	The nitrogen reduction requirements applicable to the nonpoint source assuming all analyses in this permit are correct are estimated to be on the order of 60% reduction of controllable sources. (See also 2010 WLA document Appx. C, Table 3). There is no information in the record that this is a physically attainable target and no reason to believe that DES will mandate attain this target or parties will voluntarily agree to implement such massive nonpoint source controls.	Fact Sheet at 29 – 31 (Ex. 2); NHDES 2010 Load Reduction Report, Appendix C at Table 3 (Ex. 42)	The Table cited by the Coalition indicates that the maximum reduction in NPS sources would be between 30 and 40%, in order to meet eelgrass targets in the Lamprey River. While higher reductions on the order of 60% are required in some of the other tidal rivers to meet local eelgrass targets, see e.g. Exeter River (Table 2), those calculations do not impact the Newmarket discharge and are not relevant to this permit. The Coalition did not question the attainability of nonpoint source reductions in its comments on the permit; indeed the Coalition itself proposed a specific Adaptive Management Plan that it claimed would systematically and comprehensively address nonpoint source reductions in the watershed. See Ex. 35 (Great Bay Municipal Coalition Adaptive Management Plan).	Not preserved. Mischaracterizes the record.

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