Exhibit 16A (AR H.72)

My comments on the Great Bay nutrient criteria draft document

Matt Liebman to: Alfred Basile, Phil Colarusso, 11/21/2008 01:11 PM

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Al, and the rest of the crew, here are my final comments. I won't address issues that I think the rest of you will be addressing.

A good introductory sentence that praises there efforts would be good. I like the overall weight of evidence approach, and that they are applying a conceptual model that tests whether there is a dose response relationship in the data. And, most importantly, they find secondary, or independent, impacts from increasing concentrations of nutrients. These secondary impacts are independently related to use impairments. Thus, they are following a sound scientific approach to determine nutrient and chlorophyll thesholds above which impairments are likely to occur.

We discussed the issue about phosphorus limitation in the tributaries. We should stress that since the data indicate that phosphorus may be a limiting nutrient in the tributaries, it is important to move forward with protective criteria for phosphorus in rivers and streams.

They eliminated some data below detection limit. This may introduce some bias in the dataset, so it is worthwhile to find out how many samples were excluded.

I have no problem with using a 90th percentile approach for a swimming threshold, but a little more explanation of the 20 mg/l chlorophyll standard is called for, since that influences the criterion strongly. As we discussed, we are concerned that the threshold for freshwater is 15 ug/l, but for saltwater it is 20 ug/l. Can that be reconciled, or explained? This is important, because that would result in a nitrogen criterion closer to 0.55 mg/l TN.

To convert the threshold from yearly to summer, they applied the ratio of the summer to the year for one tributary (Squamscott), but I'm wondering if the same ratio holds for the other tributaries.

Re-reading the last paragraph on the bottom of page 41, I think he misstated his conclusion. He says that organic matter may be responsible for 47% of turbidity. That was the conclusion from the previous paragraph. In this paragraph, he is correlating turbidity with nitrogen (not particulate matter).

Anyway, the next paragraph opening sentence is the key sentence. He says that chlorophyll and half of turbidity are causally linked to nitrogen. This will be an objectionable sentence to some people, because the data are correlations, not causal. 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 question would be where does the nitrogen in the particulate matter come from? Does it come from terrigenous sources, salt marsh detritus, or decomposition from eelgrass, macroalgae, or phytoplankton sources. I wonder if that has been studied in Great Bay. I'm sure it has been studied in other estuaries like Great Bay.

Hope that helps.

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