Peer Review Comments

To: Sonny Hall, St. Johns River Water Management District

From: Douglas T. Shaw, Ph.D.

Date: May 24, 2010

Re: MINIMUM LEVELS FOR JOHNS LAKE, LAKE AND ORANGE COUNTIES, FLORIDA (May 20, 2010 draft)

My comments below follow from earlier comments I made in June 2009, January 2010 and February 2010 summarized in the District's Peer Review Resolution Document and focus on the most recent draft of the Johns Lake MFL Determination report (May 20, 2010).

Overall, the report is much improved, and the majority of my earlier comments and questions have been addressed and clarified, especially with the addition of Appendices C and D. I also appreciate the changes and additions made in response to Dr. Lee Wilson's February 2010 comments, as these also address several of my previous comments and suggestions.

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1. The new material in Appendix C was very helpful to further explain how the District identifies which of the five MFL criteria to set for a given water body. It is clear from the explanation that these decisions are based more on which wetland features and other edaphic (e.g., soils) characteristics are observed in the field than on any *a priori* classification of a lake's setting or hydrologic signature. Different MFL criteria are associated with particular features, and if those features are not present or are considered "astatic," then the MFL associated with that feature is not determined. This is a pragmatic approach that allows for flexibility in setting MFLs based on what is actually observed in the field, but it also argues for more rigorous observations over a longer duration. For Johns Lake, there are several questions that still could use additional explanation:
    a. Is the quality (resolution, duration) of field observations sufficient to determine whether wetland features are truly astatic?
    b. Which specific features are considered astatic? Is this a temporary change or does it reflect some kind of long-term change in the system or its hydrology?
    c. What stresses, hydrologic or other, are responsible for this astatic behavior?
    d. Is there another wetland community type (e.g., marsh) that would be a suitable alternative for setting more frequently occurring MFLs (e.g., MA, FH, FL), perhaps in addition to IH and IL?

2. Distinguishing between "sandhill lakes" and "wetland lakes" (while acknowledging that there is a continuum of hydrologic behaviors in between) is a simple and useful classification and is stated here more clearly than in any previous report I have reviewed. However, the descriptions in Appendix C largely focus on the extreme

situations or exceptions that may warrant selecting IL and IH, rather than more typical sandhill or wetland lakes. For completeness, it would be helpful to add some description and discussion of the more typical situations for each of these lake types to the narrative on pages 107-110. Some discussion is also warranted of the special modeling problems posed by sandhill lakes, on which the District has invested considerable study and effort over the past several years. Given the utility of this lake classification, it would be helpful in the future to similarly stratify SWIDS graphs for a given plant community according to whether the setting is a sandhill or a wetland lake.

3. Some of the discussion in Appendix C suggests that if a water body (e.g., Lake Geneva) exhibits different hydrologic "states" as a result of multi-decadal climate oscillations, this situation may warrant setting IL and IH levels in lieu of FH, FL and MA. I would urge the District to be cautious with this kind of approach given our poor understanding at present about how these long term climate changes affect the hydrology of lakes and the lack of data of sufficient duration and resolution to document such changes in the field. It is entirely possible that over multiple decades, the hydrology of many of our lakes and wetlands may be changing, but we have yet to observe it. What we now consider "stable" wetland features may in fact be changing over time; likewise, features that are observed in the short term to be "astatic" may in fact be surprisingly persistent over the long term. Perhaps a better approach would be to set MFLs based on the features judged to be most stable that are present on the site now and then implement an adaptive approach for reassessing and modifying the MFLs over time. This kind of approach necessarily requires a long-term investment in and commitment to hydrobioloigical monitoring.