


October 20, 2021

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Subject: UNRBA Public Hearing Comments  
Site Specific Chlorophyll-a Standard for High Rock Lake.  
Proposed Amendments to rule 15A NCAC 02B .0211

The proposed rule amendments are NC's first attempt at setting site-specific criteria for nutrient enrichment. The UNRBA has been significantly engaged in DWR's efforts on the Nutrient Criteria Development Process. EMC action on this rule will result in a precedent setting decision. While we support the concept of a site-specific standard, members of the EMC are strongly encouraged to provide additional language before adopting the proposed rule as recommended by DWR staff. The current proposed language will result in implementation ambiguity and is subject to the whims of policy changes and unpredictable interpretations for compliance. It is essential that a site-specific standard be set with clear implementation provisions. As a result, the UNRBA offers comments that more clearly state the need for revisions to this rule before adoption.

As a point of reference, many states have adopted site-specific standards customized for the physical, biological, and hydrological characteristics of individual water bodies. North Carolina (like many other southeastern states) has few natural lakes, but it has many artificial reservoirs built for power supply, flood control, and for drinking water supply. These constructed reservoirs do not mimic the ecology and biology of natural lakes. Broadly worded chlorophyll-a criteria, as currently provided in the state-wide standards are implemented by staff policy using stringently interpreted and applied assessment methodologies. This approach does not provide an ideal site-specific water quality standard. The current assessment methodology is not appropriate for application of a site-specific standard. The adoption of a site-specific rule can provide a well-defined assessment methodology without the ambiguities of a state-wide standard. This would not only provide for the long-term sustainability of designated uses but would also provide for a consistent understanding of the site-specific standard attainment or non-attainment based on practicable compliance. Practicable (40CFR Part 131) meaning technologically possible, able to put into practice, and economically viable. An ideal site-specific standard includes an appropriate compliance (assessment) methodology based on the biological, chemical, physical, and geological characteristics of a particular artificial reservoir. A compliance statement for a state-wide criterion is not typically included because there are too many waterbody types and too much variable geography to consider – defaulting traditional state-wide criterion to differences in classification. However, compliance information is an important component of developing a site-specific standard. A modernized site-specific standard clearly addresses duration, frequency, magnitude, an allowable



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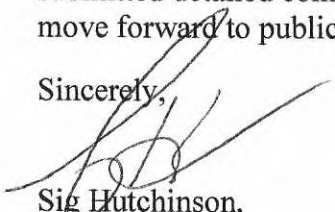
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exceedance frequency, statistical averaging, and possibly exceptions for uncontrollable drought or flood. An ideal standard would contribute to management efforts by practically relating a numeric threshold to the desired sustainability of the designated uses. The recommendations provided by the High Rock Lake Scientific Advisory Council (reiterated in our attached comments) provide for a practicable assessment of standards attainment.

Attached please find a bulleted summary of UNRBA comments. Also note that the UNRBA submitted detailed comments to the EMC on May 6, 2021 prior to the Commission's decision to move forward to public hearing.

Sincerely,



Sig Hutchinson,  
Chairman,  
UNRBA Board of Directors

## Site Specific Chlorophyll-a Standard for High Rock Lake Summary of UNRBA Comments

There are critical components of the proposed High Rock Lake rule that need to be added before proceeding to adoption by the EMC. The UNRBA supports the site-specific nature of DWR's initiative and seeks only to address issues that are incomplete and critical. The proposed rule has included the numeric criterion recommend by the SAC but has removed **critical scientific context** that was used to develop and scientifically apply the recommendations. The UNRBA supports a site-specific standard for High Rock Lake that includes the contextual recommendations reflected in the work of the SAC (Scientific Advisory Council). In removing the compliance context offered by the SAC from the proposed rule, the recommended numerical criteria has been transformed into an **unattainable goal** beyond reason and practicability. We note several key concerns that must be addressed within the rule for a successful High Rock Lake site-specific standard for chlorophyll-a.

**1. The rule should include a one-in-three-year allowable exceedance frequency as recommended by the SAC.**

**2. The rule should include a stipulation that data from all years in the current assessment period should be treated equally.**

**3. The rule should stipulate that data collected from “backwaters, isolated coves, or where water is typically shallow (e.g., <10 feet)” should be excluded from geomean calculations as recommended by the SAC.**

Backwaters, shallow waters, coves, and poorly flushed areas provide a nurturing habitat for growing chlorophyll-a in quantities greater than the numerical standards. The SAC was aware of this condition. It is therefore appropriate to include this critical exclusion within the rule. Chlorophyll-a is not a toxic substance, does not indicate algal toxin issues, nor does it provide for a measure of designated use attainment. The shallow, backwater areas are highly prized habitat and forage for fish that rely upon high biological productivity.

**4. The rule should remove the reference to a new narrative criterion that is unnecessary and erroneous.** The proposed narrative language “*Chlorophyll a shall not occur in amounts that result in an adverse impact as defined in 15A 33 NCAC 02H .1002*” includes a circular reference that establishes the site-specific chlorophyll-a geometric mean as an adverse impact. The SAC concluded that exceedances of the proposed geometric mean of 35µg/L have not been demonstrated to create acute adverse effects on the designated uses of High Rock Lake. The **current** NC narrative criteria, without including a chlorophyll-a numerical standard, is sufficient to provide adequate protection for these waters. This approach is consistent with the scientific understanding of the SAC to focus the criterion on mainstream locations with longer-term measures of the reservoir's trophic state. The SAC determined that there is a lack of clear nutrient-driven acute impacts in High Rock Lake.

**5. The High Rock Lake chlorophyll-a rule should explicitly define a site-specific assessment methodology inclusive of compliance assessment units and site-specific specific sampling stations.**

The advantages of **site-specific** standards, unlike state-wide standards, is that site-specific standards provide an opportunity to define assessment methods based on scientific knowledge of a particular lake and its ecological, morphological, and geological characteristics (shape, size, depth etc.). The current

proposed rule is inadequate because it does not include site-specific compliance information. In contrast to the current state-wide 303(d) methodology approved by the EMC, the SAC recommendation, “is intended to serve as an indicator of average algal growth during the growing season”. Compliance assessment should include more than one monitoring station and “data from individual stations should be aggregated for assessment purposes”. The DWR assessment (compliance) practice of subdividing assessment units into smaller and smaller units with the addition of monitoring stations is inappropriate.

This site-specific, precedent setting, rulemaking is an appropriate time to improve this situation. Site-specific segmentation should be based on information related to the geological and limnologic characteristics of High Rock Lake. Several states, with EPA approval, have established site-specific monitoring locations or averages from several monitoring locations explicitly within their site-specific standards to evaluate compliance with 303(d) determinations. This approach provides simplicity and understanding. We specifically note the site-specific application to 6 lakes in Georgia, 39 Reservoirs in Alabama, Pickwick Reservoir in Tennessee, all located within EPA Region IV. The use of non-representative, randomized, or “selective” sampling methods is of concern. Site-specific rules with explicit compliance methods provide for clear and unambiguous rules free from caprice.

**6. The rules should not apply a “never to exceed concentration standard” because it is counterproductive to a science-based approach to nutrient management.** A review of the forward thinking of the SAC, CIC, the evaluations offered by other states in the adoption of modernized chlorophyll-a standards, and the National Research Council’s Water Science and Technology Board’s Assessment of the Scientific Basis of the TMDL Approach to Water Pollution Reduction (2001) suggest several significant considerations:

- a) Site-specific standards can address the scientific uncertainty of establishing a single numerical standard to an entire lake or reservoir.
- b) Based on modern, EPA approved, adoption of site-specific chlorophyll-a standards in other states, it is advisable to establish compliance and assessment methods at unambiguous site-specific locations with a consistent approach to sampling and assessment.
- c) The proposed rule offers a chlorophyll-a criterion as a surrogate for designated use but does not offer evaluations of specific eutrophication impact factors that are more associated with actual designated uses. The EPA approved standards for Missouri and Arizona, combine both numeric criteria and narrative approaches (example below) to ensure confidence that scientifically uncertain numerical thresholds are not leading to 303(d) listing decisions without the likelihood of actual challenges to designated uses.
- d) Standards established without a frequency of allowable excursions are virtually impossible to comply with and constitute an intractable problem. The frequency component should be expressed in terms of the number of allowed excursions in a specified period (return period) and not in terms of a “never to be exceeded” limit. The requirement of “no exceedances” for many water quality criteria is not achievable given natural variability alone, much less with the variability associated with discharges from point and nonpoint sources.

**Example: Missouri’s Assessment endpoints include:**

- Eutrophication related mortality or morbidity events for fish or other aquatic organisms
- Epilimnetic excursions from dissolved oxygen or pH criteria
- Cyanobacteria counts in excess of 100,000 cells per milliliter.
- Shifts in aquatic diversity attributed to eutrophication.
- Excessive levels of mineral turbidity that consistently limit algal productivity May-September.