

STAC Peer Review for the James River Chlorophyll-*a* Criteria Re-evaluation



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Charge – Part I

- Review two reports related to Virginia's numeric water quality criteria for chlorophyll-*a* in the tidal James River
 - VA DEQ¹ (2016a) focused on determining whether existing chlorophyll-*a* criteria are protective of designated uses
 - Robertson (2016) describes a new assessment methodology that Virginia could use to evaluate attainment of its chlorophyll-*a* criteria
- 1) Provide general feedback on the scientific content, structure, and editorial quality in these reports
- 2) Respond to seven questions in formal request
- Report released October 2016

¹VADEQ = Virginia Department of Environmental Quality

1. Please comment on the scientific bases for applying a combined probability approach to derive expected frequencies of threshold exceedance as a function of mean chlorophyll a to determine whether attainment of these criteria would result in low rates of threshold exceedance.
2. Please comment on the approach's focus on the harmful effects of algae to derive chlorophyll criteria, rather than using reference conditions (as described in Buchanan, 2016) as an additional line of evidence.
3. Please comment on the approach for defining three categories of threshold exceedances as 'protective', 'defensible', and 'not protective' and on the approach for deciding if the categorization of these threshold exceedances are scientifically defensible. Please also comment on the general concept of applying these definitions to make the determination as to whether the existing Virginia chlorophyll a criteria are both protective of the aquatic life designated use and scientifically defensible.

4. Please comment on the following findings: “The results of the effects-based analysis suggest that the current criteria are defensible in that they fall below the non-protective range. In most cases, the criteria fall above the upper threshold for low risk indicating that lowering the values of the criteria may result in further improvements in water quality and phytoplankton condition. However in most cases, anticipated reductions in frequency of exceedance at attainment of the low risk threshold were small.”

5. Please comment on the finding that “the criteria were found to be less protective when interpreted as geometric means, indicating that conclusions regarding protectiveness are somewhat sensitive to the methodology by which attainment of the criteria is determined.”

6. Please comment on the scientific basis for replacing the current chlorophyll *a* criteria attainment assessment procedures with the proposed alternative chlorophyll *a* criteria attainment assessment procedures.

7. Please comment on whether the scientific basis and procedures described within the Scientific Advisory Panel's report could be used to derive new chlorophyll *a* criteria for application to other tidal habitats within Chesapeake Bay with the same salinity regimes and provide similar levels of protection of aquatic life.

Charge – Part II

- In response to the first STAC review, the VADEQ engaged in new analyses and developed a new approach in two completely new documents
- Respond to three new questions
- Report released in August 2017

- The panel feels that VADEQ earnestly considered the recommendations outlined in Part I, and agree that this new effort is on a path that will lead to scientifically defensible criteria and assessment methods

- Remaining issues addressed by the panel in both reports
 1. Assessment methodology and criteria derivation were not engaged in as a complementary effort
 2. Comparative analysis of the existing assessment methodology with the new methodology is warranted
 3. Separate policy discussions into a new, separate section to clearly differentiate from the analytical work