

# **SAC pH Proposals**

**June 14, 2018**

# Review of NC's Existing pH Criteria

- North Carolina's existing pH criterion for Class C freshwaters, 15A NCAC 2B .0211 (14):

*pH: shall be normal for the waters in the area, which range between 6.0 and 9.0 except that swamp waters may have a pH as low as 4.3 if it is the result of natural conditions.*

- Best uses for Class C freshwaters

*...aquatic life propagation and maintenance of biological integrity (including fishing and fish), wildlife, secondary recreation, agriculture, and any other usage except for primary recreation or as a source of water supply for drinking, culinary, or food processing purposes.*

# Proposed pH Criteria

- Option #1:

**The one-hour median pH shall be between 6.0 and 9.5 S.U.**

*Duration:* 1 hour but with no explicit requirements to require 1 hour monitoring period by DWR.

*Spatial considerations:* None

*Magnitude:* 6.0-9.5 S.U.

*Frequency:* Current DWR assessment method of no more than 10% exceedance with 90% confidence

# Proposed pH Criteria

- Option #2

**Arithmetic average for pH shall be between 6.0 and 9.0 for waters with a dissolved oxygen concentration greater than or equal to 4.0 mg/L.**

*Duration:* Short duration for the time needed to run pH profile of water column.

*Spatial Considerations:* Averaging pH measurements for the portion of the water column with sufficient dissolved oxygen.

*Magnitude:* 6.0-9.0 S.U.

*Frequency:* Current DWR assessment method of no more than 10% exceedance with 90% confidence

# Basis of Proposals

- Scientific literature
  - Upper limit of existing standard (9.0) protective of salmonids, no salmonids in HRL.
  - Warm water fish more tolerant in general to higher pH
- Site-specific conditions at HRL
  - Ammonia toxicity increased with high pH, but no observed ammonia concentrations of concern in HRL
  - Current pH levels above 9.0 with no observed deleterious impacts to fish

# Minority Report

# Critique of Option #1

- Disagreement on health status of HRL
- Conclusions of the literature not fully addressed in proposal regarding fish species in HRL
- Literature values based on laboratory work and do not fully consider the synergistic effects of pH and other stressors
- Ammonia toxicity risk increases at two monitoring stations on HRL (YAD152C AND YAD169B)

# Critique of Option #2

- Disagreement on health status of HRL
- Allowance of elevated pH levels above 9.0 is affected by same critiques for Option #1



# Next Steps

- SAC is looking for comments that would indicate a preference between the options.
- What questions does the CIC have regarding the proposals?
- Is there additional information needed from the SAC?
- Is there additional information needed to provide feedback on social and fiscal impacts of the proposals?
- What time frame will the CIC need to respond to the SAC?