

SUMMARY
AD HOC ADVISORY COMMITTEE MEETING
CHESAPEAKE BAY AND TIDAL TRIBUTARIES WQS
March 24, 2004

Welcome/Introductions

Attendees:

DEQ: Alan Pollock, Elleanore Daub, Arthur Butt, Rick Hoffman, George Walker

CB COMMISSION: Melanie Davenport

CBF: Jeff Corbin

DCR: Charlie Lunsford

EPA/CBPO - Rich Batuik, Mark Smith

Greeley & Hanson: Ed Cronin

JRA: Patti Jackson

ODU: Mike Lane

USFWS: Sumalee Hoskin,

VACo: Frank Harkson, Larry Land

VAMWA: Will Hunley, Norm LeBlanc, Chris Pomeroy, Clyde Wilber, Clifton Bell

VIMS: Ken Moore, Lyle Varnell

VMA: Bernard Kiernan, Tom Bodkin

VML: Bob Steidel

Water Clarity Criteria and Shallow Water (Submerged Aquatic Vegetation - SAV) Uses Discussion

- Review from last meeting
At the last meeting a combination SAV/Water Clarity Acreage as criteria that did not incorporate the use of application depths was discussed. The group questioned how to implement the criteria as such. DEQ is working with EPA and the other Bay states on implementation ideas. Also questioned was the basis for the restoration and existing use goals.
- Discussion of restoration goals, existing use and water clarity acreage
Restoration goals are based on historical acreage (1930-70's) or more recent (1978-2000) single best year acreage (whichever was best). In some segments, the historical acreage was composited from photographs over several years. EPA will check from exactly which years the historical acreage was composited. The maximum depth interval was determined if SAV was abundant and persistent at a deeper interval (.5 min depth or deeper if SBY SAV covered at least 20% of potential habitat or if the single best year (SBY) SAV covered at least 10% over 3 of the 4 five year periods of the recent record). The restoration goals were 'clipped' at the maximum depth interval and at the Chesapeake Bay Program's (CBP) 1:24,000 shoreline coverage. Existing use acreage was only clipped at the 1:24,000 shoreline coverage. Existing use acreage was presented that includes 2001 and 2002 information with NO clipping. Restoration goal acreage was also presented without clipping.

- EPA Review of Table IV-15 (existing use vs. restoration goals) Table IV-15 was not specifically reviewed but the discussion on existing uses vs. restoration goals was addressed in the previous discussion.
- Questions:
Which SAV and water clarity acreage should be proposed (restoration, existing uses, other)? There are still strong concerns that these acreages cannot be attained because they represent a long return frequency (i.e. 1 in 22 years for the existing uses) and that the agency should incorporate a return frequency to match the data. EPA recommends that the SAV data be assessed over a 3-year interval. More concerns raised that severe weather (extreme flows or drought) may occur during those 3 years which result wide data swings and non-attainment. The SBY (these are taken from different years for each segment) will never be attained bay wide at the frequency EPA is recommending. DEQ staff does not intend to adopt a bay wide or VA wide number. [NOTE TO GROUP- subsequent to the meeting we received a note from Ken Moore at VIMS on this topic. He states that the inter-annual variability in SAV growth is relatively small and that increases in SAV are typically gradual. See the variability in SAV over the past 20 years on the VIMS website at http://www.vims.edu/bio/sav/sav02/setments/mobph_page.html as an example. From this one can see that the wide variations in SAV over 3 year periods are not usually expected for most segments.]

An analysis of attainment indicates that even at a high level of treatment (Option 2) many basins cannot attain the C2K goal (185,000 acres SAV). DEQ asked EPA to provide attainment modeling information for each bay program segment rather than from a basin perspective. The SAV model has limitations and really just provides a sketch of increasing or decreasing SAV. The acres estimated (especially the lower numbers) by the model should be used with caution. DEQ asked the group to provide comment on the acceptability of using the existing use acreage bearing in mind that the acres could be increased during triennial review. One comment on this is that the restoration goals are conservative estimates and accurately represent what we can achieve. Another comment is that these goals are sediment driven and DEQ has no authority over the erosion controls needed to meet water clarity.

DEQ would like to dispense with the use of application depths (i.e. the water clarity criterion met at segment specific application depths) and propose a required number of acres meeting the water clarity criterion. EPA recommends this acreage be approximately 3 X higher than the SAV acreage and has published factors or percentages for states to use in calculating water clarity acreage. These factors were calculated for each segment by dividing the sum of the potential habitat (by salinity regime out to .5, 1 or 2 meters) by the restoration goal acres in that segment.

Comments on the factors were that although you really only need water clarity in the exact area where you want your SAV to grow, it may be reasonable to require larger areas of clear water since SAV may not grow in the same area each year. Another concern was raised about attainability of water clarity in these areas, how the choice of which factor to use can effect your attainability and DEQ may want to consider different methods of calculating the factors (e.g. use existing acreage to potential shallow water habitat instead of restoration goal). A concern was raised that this type of criterion also needs a return frequency component although the use of a reference condition cumulative frequency distribution for determining attainment may alleviate this concern for attainment of the water clarity acreage criteria (CFDs will be discussed at the next meeting).

How should the numerical criteria be expressed (PLW, secchi)? DEQ is unsure whether to include both the percent light through water (PLW) and secchi depth. DEQ may want to just include the equation and the PLW rather than propose the entire Table IV-1 from the criteria document.

Lunch

Chlorophyll a

- Review of chlorophyll a standard EPA proposed a narrative criterion and provides the states with information on chlorophyll a based on historical levels, literature values based on trophic status, phytoplankton reference conditions, bloom conditions and modeling data from post water clarity/D.O. attainment. A numeric criterion is not provided but states are asked to adopt numerical chlorophyll a criteria where algal related problems still exist even after the water clarity and dissolved oxygen criteria are attained.
- Review of comments received Comments included a recommendation that DEQ adopt bay wide numerical chlorophyll a criterion (based on historical values) because a narrative is difficult to implement and enforce. Conversely, comments suggested numerical criteria are not needed anywhere given the fact that we will have water clarity and dissolved oxygen criteria to improve Bay water quality. Also, the numerical concentrations discussed in the criteria document are not appropriate as numerical criteria as they are not effects based criteria (i.e. no connection to protection of designated uses).
- Review of current VA WQS related to eutrophication The designated use, general criteria and nutrient enriched waters sections state that a balanced population of aquatic life is required (including algae) and that substances that contribute to undesirable or nuisance aquatic plant growth must be controlled. DEQ is concerned that EPA narrative chlorophyll a criterion is not as stringent as our existing narrative criteria regarding control of algae. **[NOTE TO GROUP:** Subsequent to the meeting, DEQ staff has also

- recognized that the existing VA aquatic life designated use is broader in its protection of "aquatic life" than the proposed Open Water designated use contained in the Chesapeake Bay Program TSD, which supports only "fish and shellfish". Thus, aquatic life, such as macroinvertebrates, zooplankton and phytoplankton, are protected under Virginia's existing aquatic life use designation. Statements in the Chesapeake Bay Program criteria document that any particular approach that was evaluated "does not demonstrate a relationship between chlorophyll *a* concentrations and designated use impairments" should be read within the context of the more narrowly defined Chesapeake Bay "fish and shellfish" designated use.]
- **Numeric vs. narrative criteria for the James River** The James River is identified in the regulation as nutrient enriched which manifests itself as high chlorophyll *a* and a system out of balance.
 - **Discussion of chlorophyll *a* data in James** Information was presented by DEQ which showed the eutrophic condition of the James including high status and increasing trends of chlorophyll *a*, phytoplankton community imbalances and bloom conditions in the James River. There were specific concerns about the data presented including conflicting trends (e.g. some phytoplankton metrics improving, some phytoplankton metrics degrading), phytoplankton community metrics shown are driven by water quality indices such as clarity and not on healthy or target levels of plankton, the aquatic life in the James is not impaired (i.e. no 'food quality' connection to mesozooplankton identified and the fish community is good), statement of increase abundance of dinoflagellate blooms not statistically quantified and DEQs interpretation of a balanced 'desirable' community is not well defined. Also, recent controls put in place seem to have changed the N:P ratio and favoring the undesirable cyanobacteria and we have no information to show that further reductions will change the blue-green algae/bacteria problem. DEQ would like to prevent the system from getting worse as the trends are showing and believe this shift to cyanobacteria is due to the imbalance of the system and that further nutrient controls are needed to get past that. The group would like to see the unpublished paper on which some of the phytoplankton indices were based (Buchanan, et al.).
 - **EPA support documentation of numeric chlorophyll criteria** EPA presented chlorophyll *a* values which address the VA narrative water quality standards requirements for balanced aquatic life as well as control of undesirable growth of aquatic plant life. This information was labeled 'Table 2' and the information was taken from the EPA criteria document and included chlorophyll *a* levels from historical Chesapeake Bay in the VA mainstem and VA tributaries, ecosystem trophic status, phytoplankton reference communities, potentially harmful algal blooms, water quality impairments, user perceptions and other state water quality standards. Also shown was attainment data for the Rappahannock, York and James Rivers for observed concentrations, progress 2000 scenarios and the

confirmation run (nutrient removal based on tributary strategies). Some inconsistencies and additional pieces of information were noted that EPA will work on and provide to the DEQ (e.g. focus on spring vs. summer for the 1985-1994 year by year outputs separately, drop the 2000 Progress scenario, confirm the observed data is 1985-94, correct interpolator disconnects, include the correct James spring and summer month by month plots, drop all the scatterplots of seasonal concentration averages by year, and include tables by segment of the plotted data).

Given all the Table 2 data and attainability of those thresholds, EPA offered chlorophyll a concentration thresholds that could be used as numerical criteria for the James River. These were as follows:

	Spring	Summer
Upper TF:	<10	<15
Lower TF:	<15	<20
Oligohaline:	<10	<15
Mesohaline:	<10	<8
Polyhaline:	<10	<8

(Light green indicate changes to recommendations based on attainability)

Strong concerns were raised about the inappropriateness of a numerical criterion given that EPA nor the scientists that worked on the criteria document could define a chlorophyll a criteria and that chlorophyll a criteria could not be linked to designated uses. [Please refer to **NOTE** above.] EPA agrees this was true from a regional perspective but that states still need to consider numerical criteria for individual systems when algal related impacts remain after meeting D.O. and water clarity criteria. VAMWA distributed a compilation of comments related to chlorophyll a that were submitted to EPA during the chlorophyll a criteria development process during 2000 -2003. Their primary concern is the lack of scientific information linking chlorophyll a to beneficial or designated uses and that all the information presented in the criteria document do not link to impairments or designated uses. Therefore, these data are not appropriate as chlorophyll a criteria recommendations. VAMWA and others support an adaptive management approach where elements of the narrative criteria are monitored as nutrient reduction for DO and water clarity are put in place, review of ongoing research and reassessment of the need for numerical criteria.

- Chlorophyll a questions:

Should the narrative chlorophyll a criterion be included in the regulation to apply seasonally to all open waters? Responses from committee members included: Yes - because numerical criteria are not appropriate for the reasons discussed today. Yes - narrative may be useful as a management tool in addition to numerical. No - because the narrative can't be implemented or enforced and won't direct any specific nutrient controls.

How should this narrative be implemented? In the past, DEQ has been criticized for implementing the general narrative criterion and narrative use designation section as a biological criterion and is surprised there is support for using this chlorophyll narrative. If incorporated into the regulation, it should be placed and worded such that it does not supercede the existing narrative criterion, which may be more protective.

Should site specific numerical criteria be developed where algal related impairments exist even after the dissolved oxygen and water clarity criteria are attained? Responses from the committee members included: No - EPA was unable to propose numerical criteria when the Bay criteria document was published and can make no new conclusions here with the same set of data. Chlorophyll a is a trailing indicator and should be controlled via D.O. and water clarity improvements first.

Yes - if there is a concern about the link to designated uses, the state should adopt criteria that reflect the historical levels expected everywhere in the Bay. The numbers presented by EPA seem to be attainable.

How should these sites be identified (e.g. modeling, existing data, wait and see approach)? Concern raised about the use of modeling data. Values suggested are based on 175,000 pound goal and it's going to be a long time before that goal is met.

Is the James a good candidate for a numerical chlorophyll a criteria?

Responses from committee members included: No - first DEQ must define the impairment (phytoplankton taxa imbalance?) so that the group can work towards the correct criterion to reflect a balanced system. No - let the tributary strategies get implemented and then decide upon the need for a chlorophyll a numerical criterion. Yes - the impairment is seen in the instability of the system and that system has already been classified as 'nutrient enriched.'

What should the James numerical criterion be (concentration, averaging period)? See all comments above

Are there other waters we should consider for a numerical chlorophyll a criterion? Not specifically discussed but one comment related to this was that as nitrogen and phosphorus levels are reduced in the other basins (because controls are needed in the other basins to meet the D.O. criteria which is not a problem in the James), we will see chlorophyll a dropping in these basins but still high in the James.