

May 12, 2021

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Sent Via Email

Re: Comments Responding to Notice of Intended Regulatory Action, Development of  
Numeric Turbidity Criteria

Dear Mr. Whitehurst:

The undersigned submit these comments on behalf of our organizations and our members across Virginia.<sup>1</sup> The development of regulatory tools to effectively control turbidity and solids to protect our streams is many decades overdue. Problems with sedimentation in streams and with turbid conditions are, and long have been, among the most common, persistent, and visible water quality problems in Virginia and across the U.S. The Department of Environmental Quality (DEQ) must move forward expeditiously to develop numeric criteria for turbidity and/or solids.

More than two years ago, on April 15, 2019, the State Water Control Board (Board) unanimously approved a motion "to direct the DEQ staff to develop numeric turbidity standards for use across the Commonwealth and to move this into a top priority [recording unclear] on an accelerated schedule."<sup>2</sup> We support the development and adoption of numeric criteria to address the impacts of turbidity and sedimentation as quickly as can be accomplished through proceedings mandated by the Virginia Administration Process Act. (Va. Code § 2.2-4000 et seq.).

Groups represented here will be prepared to provide additional information and documents to aid in the regulatory review as it proceeds. We believe the following general principles should guide the discussions:

1. The criteria must apply to all state waters and be enforced in relation to all activities that the state or any other agency has authority to regulate.
2. The state should consider adopting numeric criteria for any or all parameters that are deemed useful and appropriate in controlling problems caused by sedimentation in waterbodies or water column turbidity and should not limit consideration to just one parameter.
3. The numeric criteria adopted must be designed to prevent interference with all designated uses, including support of aquatic life, recreation, water supply, etc.

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<sup>1</sup> The primary contact for the commenters is: David Sligh, Wild Virginia, david@wildvirginia.org, 434-964-7455, 108 5th St SE, Charlottesville, VA 22902.

<sup>2</sup> Transcribed from an audio recording entitled "*We are back at the State Water Control Board Post-lunch agenda to include a noncompliance report and the public forum,*" accessible on the Sierra Club Virginia Chapter Facebook page at <https://www.facebook.com/vasierraclub/videos/2310315712360416/>. The discussion of turbidity begins at about minute 40:30 and ends at minute 51.

4. One method for setting numeric criteria that must be assessed is the use of reference conditions that represent minimally-impacted water quality.

### **Widespread and Serious Problems**

We believe the Board's command to DEQ to develop appropriate criteria showed a recognition that turbidity and solids in our streams are a serious problem. This concern is supported by abundant evidence, which we need not discuss at length here. However, we believe it is useful to note some of that proof.

Surely the most widely-acknowledged problem caused by excessive amounts of solids in Virginia streams is the impairment of the Chesapeake Bay. As you know, Total Maximum Daily Load (TMDL) allocations and load reduction goals for sediment have been set for all of the river basins that flow into the Bay, with a 2010 total allocation for all Virginia contributions set at 2,578.90 million pounds per year.<sup>3</sup> While those larger allocations are applied through implementation plans to specific watersheds and dischargers, the addition of enforceable numeric criteria for turbidity or solids in local streams is necessary to complete the Bay cleanup effort.

In addition to the large-scale sediment control efforts to address Bay impairments, there are many local waterbody impacts within the Bay watershed that will not be controlled or prevented even if those targets are met. And, of course, those pollution control targets for the Bay do not apply to other river basins in Virginia. One piece of evidence of these localized problems is the fact that at least sixty-five (65) waterbodies have been designated "impaired" and have had TMDLs approved for sediments.<sup>4</sup> These impairments are identified through findings of reduced community health of benthic macroinvertebrates during DEQ's biological monitoring.

While the identification of sediment-related impairments through biological impacts is appropriate, this group of degraded waters does not represent the universe of waters harmed by turbidity/solids. Because of constraints on agency resources, the number of sites monitored for benthic macroinvertebrate community health is necessarily limited and so the extent of impairments caused by turbid conditions or high solids levels is surely much greater. Further, by the time these biological impacts become evident, damage to the waterbodies has already occurred. The aim of water quality standards and criteria must be to prevent such serious impacts, not merely to document them once caused and attempt to reverse the damage.

In addition to the sixty-five waters for which sediment-related TMDLs are already approved, there are other cases where waters have clearly been impaired by turbidity/solids. Construction on the Mountain Valley Pipeline (MVP) has been one of the most evident sources of turbidity/solids pollution in state waters, affecting many dozens of streams and wetlands. Some

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<sup>3</sup> U.S. EPA, *Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment*, December 29, 2010, p. ES-7.

<sup>4</sup> A list of these waterbodies can be retrieved by conducting a search for approved TMDLs by entering "sediment" as the pollutant in DEQ's online feature at <https://www.deq.virginia.gov/water/water-quality/tmdl-development/approved-tmdls>

of those impacts have occurred when the builders failed to implement plans for pollution control but many others have resulted even when best management practices (BMPs) were in place and deemed acceptable by DEQ inspectors. DEQ reports, as well as reports by citizens, other regulatory agencies, and by the company itself, show sediment-laden water entering streams from MVP sites and causing serious impairments to waters by heavy turbidity and consequent sedimentation on the beds and banks of streams and in wetlands. DEQ officials have stated that these pollution incidents are not violations of state regulations, as long as BMPs are in place and properly maintained, but adoption of appropriate numeric criteria will allow limits to be placed on discharges where technology-based controls (in this case BMPs) may be inadequate.

As discussed below, a variety of materials can produce turbid conditions in waterbodies. Sediment particles caused by erosion of soil is one form of pollution that causes turbidity and is likely the most prevalent form. However, the extensive documentation of nuisance algae problems in the Shenandoah River watershed, which has been submitted to DEQ, shows examples where planktonic algal forms fill the water column at times, blocking all or nearly all light transmission through the waters.

These are just a sampling of the thousands of instances where Virginia waters are polluted in ways that are harmful to the aquatic systems and biotic communities and cause beneficial human uses to be dangerous or unpleasant and sometimes impossible. Every Virginian has seen muddy streams proliferating in areas where development activities are underway, farming and forestry practices allow sediment discharges, and changes to runoff patterns and hydrologic characteristics of streams produce ongoing sources of sediment due to bank and bed erosion. And while sediment and other substances causing turbidity or contributing suspended solids are natural, the degree to which these conditions occur throughout the state is certainly not natural or acceptable.

### **Numeric Criteria Must Apply to All State Waters**

Water quality standards (WQS) should apply to the waterbody where designated uses are to be supported and not to discharges into that waterbody. As is clearly shown in the state's integrated reports, many waterbody impairments are caused by combinations of activities, both point and non-point sources. Further, if a stream is impaired by upstream pollution sources, a regulated discharge should not be permitted to worsen that problem, even if to a relatively small degree. Limits on discharges are to address pollution sources that contribute to WQS violations, whether they are the sole source or not.

Some states' and tribes' criteria specify only that turbidity may not be raised more than a specified amount above the levels found upstream from a discharge. For example, Iowa's criteria specify that "[t]he turbidity of the receiving water shall not be increased by more than 25 Nephelometric turbidity units (N.T.U.) by any point source discharge." 567 IAC 61.3(2). This approach leaves waters unprotected from pollution not due to a point source discharge and from the combined effects of multiple activities or sources. Again, it is vital that water quality problems that interfere with uses be acknowledged and addressed even if the immediate cause or causes cannot be identified and even if the state currently lacks authority to regulate some or all activities that contribute to water quality degradation.

It is also very important that any criteria developed through this process apply not just to perennial streams but to all intermittent and ephemeral streams as well. The definition of "state waters" in Virginia is very broad ("all water, on the surface and under the ground, wholly or partially within or bordering the Commonwealth or within its jurisdiction, including wetlands," Va. Code § 62.1-44.3.) and the criteria to prevent problems with turbidity and solids must be applied just as broadly.

**All Regulated Activities Must Be Required to Meet the Numeric Criteria**

Numeric criteria to control turbidity/solids must be applied to all regulated activities in the state and an assessment must be made in each case whether technology-based controls are adequate to meet these criteria. If compliance is not ensured, then water quality-based controls must be required. Effluent limits to reflect the numeric criteria should be applied to all activities that may violate the criteria, including construction runoff.

An example Virginia must not follow is provided in North Carolina's standards. There, numeric turbidity levels that may not be exceeded are specified for different classes of waters but a major caveat is included:

Compliance with this turbidity standard shall be deemed met when land management activities employ Best Management Practices (BMPs), as defined by Rule .0202 of this Section, recommended by the Designated Nonpoint Source Agency, as defined by Rule .0202 of this Section.

15A NCAC 02B .0211(21).

This approach is consistent with that Virginia has applied and it has failed, where officials have presumed that technology-based controls will adequately protect water quality and meet narrative criteria. It must not be carried over for the application of numeric criteria developed through this process. There should be no exemptions for any activity expressed in the criteria themselves and no presumptions that allow approval of polluting activities without proper reasonable potential review, whether through individual or general permitting or water quality certifications.

**Appropriate Numeric Criteria May Address More Than One Parameter**

Turbidity is a condition that can result from a variety of substances and conditions that affect light transmission through water. The fact that turbidity can be measured relatively easily and in field testing makes it desirable for consideration as a basis for criteria.

However, other measures could also be appropriate for setting criteria. Suspended solids or other measures should be considered in this review and, we believe, it could be desirable to adopt criteria for more than one parameter. Such an approach may provide flexibility to use different types of sampling results in assessing compliance with WQS.

A measure that the U.S. Environmental Protection Agency has developed and which could also be applied is described in that agency's water quality criteria document as follows: "Settleable and suspended solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonally established norm for aquatic life."<sup>5</sup>

We urge the DEQ and the State Water Control Board to consider all options for parameters for use in numeric criteria and to use more than one of these if useful and appropriate.

### **All Designated and Existing Uses Must Be Fully Protected**

Some discussions of potential turbidity criteria have addressed only the aquatic life impacts but any criteria developed must be designed to prevent interference with all designated uses. It may be the case that levels of solids or turbidity that are protective of aquatic life are sufficiently stringent to protect all other uses, but this must not be assumed in this review.

The varying types of impacts that turbidity-producing substances might have on aquatic life and on human uses must also be considered in setting criteria. This type of pollution can cause impairments through presence of materials in the water column, even for relatively short periods, and through deposition and alteration of habitats in waterbodies.

To properly account for protection of all uses, any criteria developed must define three measures that are all necessary to assess compliance: magnitude, frequency, and duration. It may be appropriate to adopt both instantaneous and average criteria but average goals alone will not be acceptable. Likewise, while repeated and frequent exceedances may be the most serious problems, one-time or infrequent exceedances may also be very serious negative events and may interfere with uses. For example, the evidence demonstrates that even a single storm event may contribute enough sediment runoff to cause dire results. And, if sediment in the water column is heavy enough in a single instance, this condition can certainly interfere with water supply uses and if recreational users encounter seriously-degraded conditions on just one or a few occasions, they may avoid that waterbody from that point forward.

### **Criteria Based on Reference Conditions**

The scientific literature shows that a wide range of turbidity/solids that have negative effects on the survival, growth, reproduction, and behaviors of aquatic species affect various species in different environments. Since criteria must be set to protect the most sensitive species or most vulnerable uses in an affected environment, it is likely necessary for Virginia to establish different criteria for different regions or types of waterbodies. This is not an unprecedented approach. For example, Virginia's WQS include varying levels of temperature and dissolved oxygen requirements for different waters, as appropriate for the species to be protected. The variability in conditions and needs must be accommodated and we believe the development of criteria based on a suite of natural features is both necessary and most protective.

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<sup>5</sup> U.S. EPA, *Quality Criteria for Water*, EPA 440/5-86-001, May 1, 1986, <https://www.epa.gov/sites/production/files/2018-10/documents/quality-criteria-water-1986.pdf>, pdf page 268.

One valid approach to setting the criteria is to base the levels on observed conditions in our least-affected streams and watersheds, which should represent our goals for restoration and maintenance of stream quality. A careful statistical analysis of empirical data for the parameters that are pertinent to the problems we aim to solve is a valid and defensible way to set numeric criteria.

A model for this type of development is provided by the U.S. EPA in a series of ecoregional Ambient Water Quality Criteria Recommendations documents, which "contain EPA's recommendations to states and authorized tribes for establishing their water quality standards," providing "guidance that states and tribes may use as a starting point for the criteria for their water quality standards."<sup>6</sup> EPA presents reference values for five parameters in each of fourteen larger ecoregions for the entire country and then smaller sub-ecoregions that represent areas with even more characteristics in common. The five parameters addressed include turbidity, as well as phosphorus, nitrogen, chlorophyll *a*, and periphyton chlorophyl.<sup>7</sup> These documents and numerous other sources explain the bases for empirically-based criteria and present various statistical approaches for treating sampling data to accomplish this goal.

We assert that this kind of approach may well be the best available for developing criteria that are appropriate for specific environments and aimed at the appropriate water quality goals - achieving high quality in our streams, rather than just a lowest common denominator of barely acceptable conditions.

It is important to understand that Virginia and other states already use this reference-based approach in setting numeric goals for sediments in relation to TMDLs such as those discussed above.<sup>8</sup> Given that these TMDLs essentially serve as area-specific water quality criteria for the affected waterbodies and are the bases for allocations and effluent limitations in discharge permits, it is clear that this method is acceptable to DEQ and the Board and approvable by the EPA.

One essential resource to make this empirically-based method of criteria setting work is a significant body of sampling data for the applicable parameters. The referenced EPA documents are based on thousands of data points and there are very large additional databases with turbidity and suspended solids information that can be used.

In conclusion, the DEQ has the tools it needs to develop usable, approvable, and effective criteria to protect our waters from turbidity and solids and must do so now. This will supplement the existing narrative criteria, which already prohibit these types of impairments and must be used,

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<sup>6</sup> The series of documents for each ecoregion, for rivers and streams, is accessible at <https://www.epa.gov/nutrient-policy-data/ecoregional-nutrient-criteria-rivers-and-streams>.

<sup>7</sup> For e.g.: U.S. EPA, Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Nutrient Ecoregion IX, EPA 822-B-00-019, December 2000, at vi.

<sup>8</sup> See e.g. discussion about use of reference watersheds to set TMDLs in: Virginia DEQ, *Roanoke River Bacteria and Sediment TMDL Implementation Plan*, April 2015.

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but numeric requirements are necessary, both practically and legally. Further, the principles of complete coverage for all our state waters and application of criteria to waterbodies, not discharges alone, must be reflected in the criteria adopted.

Thank you for accepting our comments and we look forward to working with you during the regulatory advisory panel process.

Sincerely,

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