



# AppalachianVoices

Protecting the Central and Southern Appalachian Mountain Region

Public comments submitted on behalf of:

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EPA Water Docket  
EPA Docket Center  
William Jefferson Clinton West Building, Room 3334  
1301 Constitution Avenue NW, Washington, DC 20004  
Docket No. EPA-HQ-OW-2004-0019

Email: ow-docket@epa.gov. Attention Docket No. EPA-HQ-OW-2004-0019.

**RE: External Peer Review Draft Aquatic Life Ambient Water Quality Criterion for Selenium--Freshwater 2014**

Dear Sir or Madam,

We would like to thank you for the opportunity to comment on the EPA's proposed External Peer Review Draft Aquatic Life Criterion for Selenium in Freshwater. These comments are intended to supplement those submitted by Benjamin Lockett of Appalachian Mountain Advocates, on behalf of Appalachian Voices, and a number of other organizations. Appalachian Voices is a North Carolina based nonprofit working to protect and improve water quality across Appalachia. Selenium is a major source of pollution from coal mines across Appalachia, and we have particular concerns about this standard and its implications in our region. Primarily, we do not believe that this standard will be adequate to protect aquatic life. Also, we have significant concerns about the implementation of a fish tissue based standard, especially with regards to citizen enforcement actions. Please feel free to contact us with any questions or for any further information.

**Citizen Enforcement Will be Difficult or Impossible**

One of Appalachian Voices' major initiatives is a citizen-science water quality monitoring program called the Appalachian Community Enforcement (ACE) Project. The ACE project is a joint effort between 16 groups across the coal-impacted region of Central Appalachia. In order to engage community members in the health of the streams they care about, the ACE project equips local people with the knowledge, instruments and professional support to monitor their local waterways. To date the ACE Project has trained over 170 volunteers in water monitoring.

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Those who care about their local waterways generally want to do what they can to change it for the better. Unfortunately, these new standards will further tie the hands of citizens hoping to improve water quality in Appalachia. Citizen monitors are often the first, and at times only, way a water quality issue comes to light. Through citizen monitoring and citizen water pollution reporting, Appalachian Voices and other organizations throughout Central Appalachia have identified acid mine drainage, unpermitted mine discharge, permit limit exceedances and other water quality violations.

Selenium pollution has been established as one of the major causes of decreased quality and quantity of aquatic communities below mountaintop removal coal mines<sup>i</sup>, yet in many cases regulatory authorities have been reluctant to address it. As a result, citizen enforcement has been the main driving force for the enforcement of selenium water quality standards at coal mines in Central Appalachia. Unfortunately, citizens' suits were necessary to achieve the addition of selenium limits on national pollutant discharge elimination system (NPDES) permits in West Virginia, and further litigation was needed for enforcement of those limits. Similar cases have also been filed in Kentucky and Virginia. Currently there are no active NPDES permits for coal mines with selenium limits in Kentucky<sup>ii</sup>. In Virginia there is only one permit (VA/NPDES permit number 0082052) that has been required to address selenium, but that was a result of a court order, based on a citizen suit<sup>iii</sup>.

Litigation is both costly and time-consuming for citizens' groups, but is unfortunately often necessary to ensure adequate protection of public waters. Currently, in order to pursue excessive selenium discharges, citizens' organizations undertake water column grab sampling in public waterways downstream of NPDES discharge points. Some courts have required at least four consecutive days of grab sampling in order to establish violations of the current, four day chronic selenium criterion.

The proposed changes to the selenium criteria will make citizens' pursuit of selenium enforcement much more difficult. Potential foreseeable problems include:

- The need to sample for more than 4 days, possibly up to 30 or more days. This issue would increase both the time and cost necessary to confirm a violation.
- The standard for intermittent exposure is likely to be misapplied to situations where less than 30 days of data is available or where the duration of a discharge is unknown. In these cases, the proposed standard will be significantly weaker than either the current standard or the proposed 30 day standard, allowing a four day average concentration of 36 ug/L (lentic, assuming a background concentration of 0 ug/L). Application of this standard will be further complicated by the fact that in many cases the background selenium concentration is unknown.
- The need to collect fish tissue samples to confirm a violation. Several issues arise when considering this possibility. In some cases, all fish may have already been extirpated from the stream. In other cases, sensitive species may have been extirpated, leaving only more tolerant species that may accumulate selenium at a slower rate. Time, cost and logistics all become more problematic as individuals will likely need state permits to collect fish

samples, and laboratory fees will likely be higher. Additionally, training citizens to collect fish tissue samples is more difficult than training for water column grab samples.

This standard will be more difficult and costly to enforce, both for state agencies with limited resources and for individual citizens. Enforcing a standard based on four elements - fish egg/ovary, fish whole-body, chronic water-column and intermittent water-column - will likely increase the extent to which resolution of violations is held up in lengthy and costly litigation. Overall, we anticipate the new standard leading to decreased compliance from industries that discharge selenium.

### **The Standard is Too Weak to be Protective of Aquatic Life**

The currently proposed standards are too weak to be protective of aquatic life. The Water Quality Standards Regulation states “water quality standards should, wherever attainable, provide water quality for the protection and propagation of fish, shellfish and wildlife.”<sup>iv</sup> A water quality standard should be protective of aquatic life, but in its current form, this standard is too weak to perform its intended purpose.

The newly proposed tissue based standards are too weak, and contradict well established science. Studies have shown negative effects of selenium at levels that are only half as high as the fish tissue standards proposed by the EPA. A recent study published in the journal *Aquatic Toxicology* found that compared to the control group, the reproductive success of zebrafish was reduced by half with average selenium concentrations of 4.3 ppm (whole body, dry weight) and 7.2 ppm (eggs, dry weight)<sup>v</sup>. These concentrations are significantly lower than the EPA’s proposed standards, and indicate that those standards will not be protective of aquatic life.

A toxicity threshold that is well below the EPA’s proposed standards is not a new development in the scientific literature. In 2003 a review of existing literature by US Geological Survey researcher Steven Hamilton states, “The majority of the selenium literature supports a whole-body threshold of 4 mg/g in fish and 3 mg/g in diet.” The review goes on to state that there are issues with the studies proposing higher toxicity thresholds, and states, “The proposed high-selenium thresholds by DeForest et al. (1999) and Brix et al. (2000) does not stand on equal footing with reviews of more extensive datasets by USDOJ (1998), Lemly (1996), Maier and Knight (1994), and Hamilton (2002). Recent studies continue to support the dietary selenium threshold of 3 mg/g and the whole-body selenium threshold of 4 mg/g for fish.”<sup>vi</sup>

The newly proposed standard for whole body selenium is slightly less protective than the draft proposed by the EPA in 2004. The EPA subsequently withdrew that draft, based in part on public comments from scientists and other agencies showing that the proposed criterion was too high and would not be protective of sensitive species. Because this current draft standard is even weaker, comments from the previous draft are still applicable and should be considered by the EPA when evaluating this current draft. In reference to the previously proposed standards, the US Fish and Wildlife Service stated, “The draft criteria document proposes an acute aquatic life criterion of 185 ug/L in the water column and a chronic aquatic life criterion of 7.9 ug/g (dry weight in fish tissue). *Based on a large body of scientific evidence the Service believes these*

*criteria values will not protect federally listed fish and wildlife species. Furthermore, the service believes these values are not even sufficient to protect the aquatic life for which the criteria were developed.”<sup>vii</sup>*

These newly proposed draft standards are also substantially similar to those approved by the EPA adopted by Kentucky in late 2013. In response to the EPA’s biological evaluation for those new standards, the US Fish and Wildlife service stated, “the Service believes the described standards may result in negative impacts to federally-listed species. Potential negative impacts to threatened and/or endangered species include...significant food chain-based effects to federally-listed, egg-laying vertebrates associated with the selenium criterion. Consequently, the Service is unable to concur with EPA's determinations.”<sup>viii</sup>

Fish and Wildlife has repeatedly told the EPA that several substantially similar selenium standards would result in impacts to federally listed species. This set of draft standards is no different, they are too weak to protect aquatic life and are thus likely to result in the “take” of federally listed threatened and endangered species.

### **The EPA Should Strengthen the Proposed Criteria**

In order to create a standard that is both scientifically valid and enforceable, the **EPA should adopt a standard that is based solely on water column criteria that are translated from fish tissue concentrations**. When developing standards, the EPA needs to consider the feasibility of their implementation. A tissue based standard will be extremely difficult to enforce. The currently proposed standard demonstrates that water column criteria can be derived from fish tissue concentrations. First, the EPA should consider the issues mentioned above and those raised in response to previous proposed standards and determine a fish tissue concentration that will be protective of all species. This includes selenium sensitive fish species as well as aquatic dependent wildlife like birds. This fish tissue concentration should then be translated into a water column-only standard in order to avoid implementation issues.

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<sup>i</sup> U.S. EPA (Environmental Protection Agency). 2011. The Effects of Mountaintop Mines and Valley Fills on Aquatic Ecosystems of the Central Appalachian Coalfields. Office of Research and Development, National Center for Environmental Assessment, Washington, DC. EPA/600/R-09/138F.

<sup>ii</sup> Based on Appalachian Voices Review of Kentucky Energy and Environment Cabinet, Division of Water, response to Open Records Act request for “A copy of a list of current Individual KPDES permits, identified by Permittee and Permit Number, for which either an acute or chronic water-quality based effluent limit for selenium has been imposed.” submitted by Kentucky Resources Council, Inc. April 18, 2013. None of the facilities with selenium limitations in their KPDES permits were coal mines.

However, recently KY DEP has issued a single draft individual KPDES permit for coal mining containing limitations on selenium. To the best of our knowledge a final permit has not yet been issued. Despite being issued a permit from the Kentucky Division of Natural Resources in January of 2011, it appears that mining at this facility has yet to begin. See the draft KPDES permit for Nally & Hamilton Enterprises Inc. DNR permit number 848-0292, KPDES Permit KY0108227 (June 19, 2014), AI No. 101089, available at: [http://dep.gateway.ky.gov/eSearch/search\\_ai\\_detail.aspx?AgencyID=101089](http://dep.gateway.ky.gov/eSearch/search_ai_detail.aspx?AgencyID=101089).

<sup>iii</sup> Southern Appalachian Mountain Stewards et al. v. A&G Coal Corp., case number 13-2050, currently under appeal in the U.S. Court of Appeals for the Fourth Circuit.

<sup>iv</sup> 40 CFR 131.2

<sup>v</sup> S. Penglase. Selenium and Mercury have a Synergistic Negative Effect on Fish Reproduction. *Aquatic Toxicology* 149 pages 16–24 (See section 4.3 paragraph 2). 2014.

<sup>vi</sup> Hamilton, S.J., 2003. Review of residue-based selenium toxicity thresholds for fresh-water fish. *Ecotoxicology and Environmental Safety* 56, 201–210.

<sup>vii</sup> Letter to Geoffrey H. Grubbs, Director, USEPA/OST, from Wayne White, Manager, U.S. Department of the Interior, Fish and Wildlife Service, California/Nevada Operations Office, re: the USEPA Draft Aquatic Life Criteria Document for Selenium. May 15, 2002. <http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OW-2004-0019-0009>

<sup>viii</sup> Virgil Lee Andrews, Jr.. FWS #2014-B-0086; Biological Evaluation for the EPA's approval of new and revised water quality standards for Kentucky. December 27, 2013.