



APPALACHIAN MOUNTAIN ADVOCATES

Great Horned Owl © Estate of Roger Tory Peterson.

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February 11, 2013

Administrative Regulations Review Subcommittee
Capital Annex Room 149
State Capitol
Frankfort, KY 40601

RE: Proposed revision to the selenium water quality criteria

Dear Legislators:

Please accept these comments on behalf of Appalachian Mountain Advocates, Sierra Club, Kentuckians for the Commonwealth, Kentucky Waterways Alliance, Appalachian Citizens' Law Center and Appalachian Voices. We are greatly concerned about Kentucky's triennial review of water quality standards and revisions to the water quality criteria for the toxic pollutant selenium proposed by the Kentucky Division of Water ("DOW") on February 5, 2013.

We request that the Subcommittee recommend that the Cabinet defer the regulations so that DOW can provide sufficient notice and time for the public to adequately review the proposed changes and submit complete comments at a new hearing before the agency itself. Even if DOW accepts comments after today's hearing, it will not comply with the CWA's requirements until it provides notice of a hearing on the revisions at least 45 days in advance of that hearing.

Our concerns related to the proposed revisions to the selenium criteria include:

1. the opportunity to present information at the hearing today, while appreciated, does not comply with Clean Water Act ("CWA" or "the Act") public participation requirements, which apply to DOW's revisions to Kentucky's water quality standards;
2. the proposed acute criterion will result in significant selenium bioaccumulation in aquatic life and other harm to wildlife and the environment and should be withdrawn;
3. sulfate will not reduce bioaccumulation of selenium in ecological settings and should not be considered when setting the acute criterion;
4. the proposed whole body fish criterion is too high, will not protect fish or wildlife and should be withdrawn;
5. the proposed egg/ovary criterion is too high, will not protect fish or wildlife and should be withdrawn;

6. the proposed tiered approach to implementing the chronic selenium criteria is flawed, will allow harmful bioaccumulation of selenium, would allow total extirpation of fish species and exempts fishless streams from the chronic selenium criteria;
7. the proposed chronic fish tissue criteria are effectively unenforceable and are not compatible with the development of effluent limitations that will protect against harm from selenium pollution;
8. the proposed criteria will not protect wildlife dependent on aquatic habitat for survival;
9. the proposed criteria do not protect threatened and endangered species.

Selenium pollution in Kentucky is a serious problem that, so far, the Commonwealth has refused to address or even recognize. At even very low concentrations, selenium has severe impacts on aquatic life and other wildlife that depend on healthy streams. Remarkably, Kentucky has never placed selenium limits on a coal mining NPDES permit despite its knowledge that selenium is a significant problem for the health of its waters. In West Virginia, by comparison, coal operators are routinely expected to comply with the existing selenium water quality standards.

Kentucky must decide whether it will follow the law and protect its water resources or whether it will continue to allow coal mining operators to have their way with its environment. Adoption of the current proposal to change the selenium water quality standard would be another step backward from a State that is already losing the race to save its rivers and streams. Additionally, DOW's attempt to adopt the new selenium standard without complying with well-established public participation requirements shows that the agency's interest is in providing quick relief to polluters and not in developing a sound water quality standard.

In effect, DOW is proposing to eliminate protections from selenium pollution provided to Kentucky's streams. The current selenium water quality standards for aquatic habitat include an acute criterion of 20 µg/L in the water column and a chronic criterion 5 µg/L in the water column. DOW proposes to increase the acute criterion to 258 µg/L in the water column, or even higher based on the concentration of sulfate in the water column, and to replace the chronic criterion with a criterion based on the concentration of selenium in fish tissue. Both criteria would allow total extirpation of sensitive fish species from Kentucky's waters and both should be rejected as scientifically indefensible and because they would be unenforceable by EPA, DOW regulators or citizens.

Not only does DOW's proposal fail to withstand scientific scrutiny, it also fails to comply with important public participation requirements. The currently proposed selenium criteria were not part of the DOW's original water quality standards revisions that were subject to a 30-day comment period. Rather, notice of the changes to the selenium criteria was provided to the public only six days before this hearing. Six days is insufficient time to develop fully adequate comments on these complex, technical changes to Kentucky's important water quality protections. As such, these comments represent only a limited, preliminary critique of DOW's proposed weakening of the selenium water quality criteria. Again, we request that the Subcommittee recommend that the Cabinet defer the regulations so that it can provide

adequate notice and time for the public to more carefully review the proposed changes and submit complete comments.

Background: Selenium is a significant problem in the coal mining regions of Kentucky

Selenium is a toxic pollutant that is very harmful to aquatic life and other wildlife that depend on healthy streams. Surface coal mining is one of the major sources of elevated selenium in the environment. As A. Dennis Lemly, Ph.D., Research Professor of Biology at Wake Forest University and leading selenium expert, explained in a 2009 report,

Once in the aquatic environment, waterborne selenium can enter the food chain and reach levels that are toxic to fish and wildlife (Figure 1). Impacts may be rapid and severe, eliminating entire communities of fish and causing reproductive failure in aquatic birds (Lemly 1985b, Ohlendorf 1989). Few environmental contaminants have the potential to detrimentally impact aquatic resources on such a broad scale, and even fewer exhibit the complex aquatic cycling pathways and range of toxic effects that are characteristic of selenium. . . . In recent years there has been an escalation in selenium pollution episodes associated with coal mining in North America and elsewhere (Lemly 2004), which has resulted in major environmental damage (Lemly 2008). . . .

. . . .
The most important principle to understand when evaluating the hazard of selenium from mountaintop removal coal mining is its ability to bioaccumulate. This means that a low concentration of selenium in water has the potential to increase by several orders of magnitude by the time it reaches fish and wildlife. For example, a water concentration of 10 µg/L (micrograms per liter or parts-per-billion) can increase to over 5,000 times that amount in fish tissues. Bioaccumulation causes otherwise harmless concentrations of selenium to reach toxic levels. . . . [I]n order to protect fish from selenium poisoning it is essential to keep waterborne selenium below levels that cause bioaccumulation in the food chain (Lemly and Smith 1987).¹

Selenium pollution is a significant, demonstrated problem in the coal mining regions of Kentucky. The Mountaintop Mining Programmatic Environmental Impact Statement (EIS) studied water quality impacts from mountaintop removal coal mining. Those studies included assessment of instream selenium levels below mining sites. The review of selenium data led to the conclusion that:

In the region of MTM/VF mining, the coals can contain an average of 4 ppm² of selenium, normal soils can average 0.2 ppm, and the allowable limits in the streams are

¹ Lemly, A. Dennis. Aquatic Hazard of Selenium Pollution From Mountaintop Removal Coal Mining. 2009 at 2-3. Attached.

² Note: ppm in this instance is equivalent to µg/g.

5 µg/L (0.005 ppm). Disturbing coal and soils during MTM/VF mining could be expected to result in violations of the stream limit for selenium.”³

Further, as a result of high selenium levels in the coal and surrounding strata, the EIS found:

Valley fills are strongly associated with violations of water quality standards for selenium, a toxic metal that bioaccumulates in aquatic life. All 66 selenium violations were downstream from valley fills, and no other tested sites had selenium violations.⁴

Several sources of data show that Kentucky is no exception to the conclusions in the EIS and that selenium is a significant water quality problem in the eastern and western coal fields. First, in 2005 the United States Geological Survey did a study of the selenium levels in coals from a number of central Appalachian states. Over 700 samples from Kentucky were evaluated and many of those samples exceeded the 4 ppm (µg/g) threshold established in the EIS.⁵ This means that mining coal in the areas evaluated is likely to cause or contribute to selenium water quality standards exceedances. Second, hundreds of records obtained by Appalachian Mountain Advocates (AMA) through a recent Open Records request to the DOW showed self-reported priority pollutant discharge data submitted to the Division pursuant to general and individual permitting requirements. Most of the data was from general permit holders.⁶ Many of those samples confirm selenium pollution and show selenium at 3 µg/g or greater. Some samples were very high. Examples include: KYG046480, 79 and 26 µg/l; KYG046588, 25 µg/l; KYG046455, 15 µg/l; KYG046636, 14 µg/l; and KYG045589, 34 µg/l. Those toxic discharges continue unabated and are causing bioaccumulation of selenium in rivers and the many reservoirs downstream of mining operations. Third, DOW’s own data show selenium is a significant problem in southeastern Kentucky. In 2007, DOW conducted a brief water quality and fish tissue survey of selenium impacts in the eastern coalfields.⁷ The survey looked at headwater tributaries at thirteen sites in eastern Kentucky including nine coal mining sites (reclaimed and Abandoned Mine Lands), two reference sites and two sites located at road cuts. At one coal mining site and one road cut site, water downstream from the disturbance exceeded Kentucky’s existing chronic quality criterion for selenium. Additional water quality data showed elevated levels of selenium on the mining sites. Importantly, the survey also found fish at three of the nine mining sites where selenium content exceeded the Environmental Protection Agency’s previously recommended fish tissue criterion of 7.91 µg/g, a standard that—as demonstrated below—selenium experts have shown is significantly above

³ Bryant, Gary, McPhilliamy, Scott and Childers, Hope. April 8, 2002. *A Survey of the Water Quality of Streams in the Primary Region of Mountaintop Valley Fill Coal Mining: October 1999 to January 2001*. USEPA Environmental Services Division Region 3 at 74.

⁴ See <http://www.epa.gov/region3/mtntop/eis2003.htm> at III-D.6 to III-D.7.

⁵ See <http://pubs.usgs.gov/of/2005/1330/> at Appendix.

⁶ Open Records request from Margaret Janes of AMA to Kentucky DOW September 20, 2012.

⁷ Open Records requests from Margaret Janes of AMA to DOW December 15, 2008, March 3, 2009 and August 24, 2009. DOW finally released the data to AMA in the fall of 2009. It is unclear how these sites were chosen and if the mining sites were in coal seams typically high in selenium. It is possible that these data significantly underrepresent the presence of selenium pollution in Kentucky’s streams.

the level required to adequately protect aquatic life.⁸ Downstream from five other mining sites and both road cut sites, researchers found fish with selenium levels at which scientists have found adverse effects in sensitive species (4 µg/g).⁹

1. DOW Has Not Complied with The CWA's Public Notice Requirements Applicable to Its Revisions to the Selenium Water Quality Criteria

The Division of Water's revisions to Kentucky's water quality standards are governed by Section 303(c) of the CWA, 33 U.S.C. § 1313(c), and implementing regulations. The "triennial review" process is mandated by Section 303(c)(1), which states that DOW "shall from time to time (but at least once each three year period beginning with October 18, 1972) hold public hearings for the purpose of reviewing applicable water quality standards and, as appropriate, modifying and adopting standards." EPA's regulation at 40 C.F.R. § 131.20(b) governs public participation in State review and revision of water quality standards, including the hearings required by Section 303(c)(1). That regulation mandates that "[t]he State shall hold a public hearing for the purpose of reviewing water quality standards, in accordance with provisions of State law, EPA's water quality management regulation (40 CFR 130.3(b)(6)) and public participation regulation (40 CFR Part 25). The proposed water quality standards revision and supporting analyses shall be made available to the public prior to the hearing." EPA's public participation regulation requires that notice of the hearing must be provided at least 45 days prior to the date of the hearing, unless EPA determines that special circumstances warrant a shorter time frame, which circumstances are not present here. 40 C.F.R. § 25.5(b). Furthermore, "[r]eports, documents and data relevant to the discussion at the public hearing shall be available to the public at least 30 days before the hearing. Earlier availability of materials relevant to the hearing will further assist public participation and is encouraged where possible." *Id.*

DOW has not complied with those regulations with respect to its proposed revisions to the selenium criteria. DOW originally proposed changes to Kentucky's water quality standards and published the proposed revision in the Administrative Register of Kentucky on Sept. 1, 2012. The cabinet held a public hearing on Sept. 27, 2012 and received public comment on the proposed standards through Oct. 1, 2012.¹⁰ Those revisions, however, did not include the current proposals to increase the acute criterion by more than twelve times or to replace the current chronic water column criterion with a set of weak tissue-based criteria. The previous public process thus provided no opportunity for input on the proposed revisions to the selenium criteria.

DOW provided notice to the public of the current proposed revisions on February 5, 2013, less than a week prior to the February 11, 2013 hearing before the Administrative Regulations Review Subcommittee. *Id.* Such a short time is insufficient to allow the public to develop

⁸ As discussed below, significant research demonstrates that the EPA's proposed criterion was too high to be protective of stream uses. The standard was not adopted because of severe criticism.

⁹ Lemly, A. Dennis. Selenium Assessment in Aquatic Ecosystems: A Guide for Hazard Evaluation and water quality Criteria. Springer. 2002. at 31.

¹⁰ See <http://water.ky.gov/waterquality/Pages/WaterQualityStandards.aspx> (last visited Feb. 9, 2013).

complete comments on the very complex, technical issues involved in the DOW's weakening of Kentucky water quality protections. DOW's action violates 40 C.F.R. § 25.5(b)'s requirements that notice of hearings on proposed revisions be given 45 days in advance and that relevant reports, documents and data be provided at least 30 days prior to the hearing. Those violations will prevent EPA approval of the proposed revisions, which is required for them to take effect. 40. C.F.R. §§ 131.5(a)(3), 131.21(b), (c).

Again, we request that the Subcommittee recommend that the Cabinet defer the regulations so that DOW can provide sufficient notice and time for the public to adequately review the proposed changes and submit complete comments at a new hearing before the agency itself. Even if DOW accepts comments after today's hearing, it will not comply with the CWA's requirements until it provides notice of a hearing on the revisions at least 45 days in advance of that hearing. Furthermore, the Cabinet needs to hold its own hearing so that it can meaningfully consider public input and take the public's comments into account before finalizing its revisions. Hearings before legislative committees and subcommittees, where DOW has already submitted its proposed revisions, do not provide a meaningful opportunity for public participation in the revision of water quality standards designed to protect the public. The DOW's desire to quickly pass these proposed revisions does not justify its failure to follow the required procedures for public involvement.

In the event that DOW does not hold further hearings or officially accept comments into the administrative record, we consider these to be our official comments to DOW and to EPA for the purposes of its review DOW's proposed revisions.

2. The proposed acute criterion will not protect Kentucky's streams for the designated use of warm water aquatic habitat

The proposed acute criterion is identical to the one that the Environmental Protection Agency ("EPA") proposed in 2004 but never adopted.¹¹ EPA's 2004 attempt to set the acute aquatic life criterion was the first time EPA did so in conjunction with a bioaccumulative toxin and tissue based criterion. At the time, EPA was criticized by the leading scientific experts in the field for addressing neither the bioaccumulative nature of selenium nor the harm caused by large loads of the toxin entering waterways. The acute and chronic criteria should work together. Setting the acute criterion at the proposed level would inevitably lead to bioaccumulation at a toxic level greater than the proposed tissue-based criterion. DOW *must* consider impacts on the food web from short duration selenium loads when setting the acute selenium criterion. The United States Fish and Wildlife Service ("FWS") commented on EPA's proposed acute criterion and recommended EPA abandon its proposal stating:

The guidelines employed to draft the proposed acute criteria for selenium (Stephan et al. 1985) are recognized both within EPA and throughout the scientific community as

¹¹ Notice of Draft Aquatic Life Criteria for Selenium and Request for Scientific Information, Data, and Views, 69 Fed. Reg. 75541 (Dec. 17, 2004).

not being most relevant for application to highly bioaccumulative pollutants (e.g., Reiley et al. 2003). For proposed acute criteria of a bioaccumulative pollutant, one needs to know toxic risks for fish and wildlife based on their dietary exposures and the risk posed by exposure to the proposed water concentration. Although an acute excursion may be very short-lived in the water column, for bioaccumulative pollutants, the food web effects last much longer (e.g., Maier et al. 1998). The USFWS recommends the USEPA consider bioaccumulation as part of a multipathway exposure in the acute criterion. The USFWS realizes it may be necessary to collect data to evaluate the toxic risks to fish and wildlife based on their dietary exposures.¹²

Further, studies show that short duration selenium spikes at levels less than five percent of the proposed criterion lead to significant selenium bioaccumulation in macroinvertebrates and macrophytes and are readily transferred to upper trophic levels. An important study by Maier et al showed a single short duration selenium spike of approximately 10 µg/L caused selenium bioaccumulation in macroinvertebrates. Eleven days after the spike, selenium concentrations in macroinvertebrates increased by nearly 300% and persisted in the system for a year or longer after selenium in the water column dropped to less than 1 µg/l.¹³

Further, the United States Fish and Wildlife Service (USFWS) in its Final Biological Opinion on the effects of the U.S. Environmental Protection Agency's "Final Rule for the Promulgation of Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California," observed impacts of single pulses of selenium to aquatic systems:

[I]n February 1995, the Tulare Lake Drainage District established a flow-thru compensation wetland. Although the water supplied to the wetland was generally managed to keep its selenium content at or below about 2-3 µg/L a pulse of 23 µg/L was documented on March 29, 1995 (Tulare Lake Drainage Ms. Felicia Marcus 125 District 1996; Hanson et al. 1996). Three months later (June 20, 1995), and without any additional selenium pulses, avian eggs sampled at the site contained up to 6.2 µg/g Se which exceeds the embryotoxic risk threshold reported in Skorupa (1998). In June 1995, 12% of sampled eggs exceeded 6 µg/g Se which very plausibly may have been linked to the late March pulse of 23 µg/l Se that passed through the system. Additional support for a "pulse-effect" hypothesis, is provided by monitoring data for 1996-1 998. In each of those three years, water supplied to the wetland was never documented to exceed 2.8 to 4.2 µg/l Se, and in all three years, in the absence of a > 10 µg/l Se pulse, none of the avian eggs collected at the site exceeded the embryotoxicity threshold of 6 µg/g Se (Hansen's Biological Consulting et al. 1997a, 1997b, 1998).¹⁴

¹² Letter to Stephan L. Johnson, Administrator USEPA, from Everett F. Wilson, Chief, Division of Environmental Quality USFWS, May 19, 2005. Attached.

¹³ Maier et al. Accumulation of Selenium by the Aquatic Biota of a Watershed Treated with Seleniferous Fertilizer. Bulletin of Environmental Contamination and Toxicology. 1998 60:409-416 at 414. Attached.

¹⁴ USFWS. Technical Review: Smoky Canyon Mine Site-Specific Selenium Criterion Report. January 2012 at 124 to 125. Attached.

In that same opinion, USFWS critiques EPA's earlier 304(a) acute criterion of 20 µg/L and existing EPA selenium species weighted criterion guidance as too high. The agency concludes that "a single pulse of selenium (≥ 10 µg/L) into aquatic ecosystems could have lasting ramifications, including elevated selenium concentrations in aquatic food webs (Maier *et al.* (in press))."¹⁵ DOW's proposed criterion is more than twelve times greater than the 20 µg/L criterion that FWS found to be unprotective. Thus, Kentucky's proposed acute selenium criterion should be rejected because it will inevitably lead to harmful bioaccumulation of selenium in fish, other aquatic and wild life.

3. Sulfate will not reduce bioaccumulation of selenium in ecological settings

DOW erroneously claims that "the presence of sulfate in the water column modifies or attenuates the potential acute toxicity effects of selenite."¹⁶ The USFWS in its Technical Review: Smoky Canyon Mine Site-Specific Selenium Criterion Report in January 2012 explains that sulfate has not been shown to mitigate selenium toxicity in the field.

Sulfate inhibition of selenate uptake, while demonstrated in the laboratory for environmentally unrealistic conditions (very short-term exposures without other chemical species of selenium present), has never been demonstrated to meaningfully alter bioaccumulation of selenium into aquatic organisms under field conditions, even in selenate-dominated waters (e.g. Birkner 1978). The authors of lab studies demonstrating sulfate reduction of selenium uptake in aquatic organisms clearly recognized the strict limits of their work for extrapolation to natural waters. For example, Hansen et al. (1993:77) wrote, "Thus, at this time, it does not appear that we have sufficient evidence to justify the consideration of sulfate as a factor in the regulation of Se in aquatic environments." Williams et al. (1994:452) wrote, "At present there is little information available that allows us to assess how relevant this study's conclusions will be in natural waters containing a complex assemblage of selenium [chemical] species." Finally, Ogle and Knight (1996:278) reported that for water concentrations of selenium near the national criterion of 5 µg/l, "...the differences [in selenium bioaccumulation and toxicity] between extremely different sulfate concentrations are not significant..." In short, there is not a reasonable scientific basis to expect the sulfate concentrations in the study area to make any difference with regards to a site-specific selenium criterion. [p.33]¹⁷

In a 1997 letter to EPA the FWS says that, "[s]ulfate-interference does not appreciably affect selenium bioaccumulation in real-world environments and that has been known for at least 60 years."¹⁸ And further, "[r]ecent 48-hr-96-hr lab bench experiments are simply too short in

¹⁵ Id. at 124.

¹⁶ See Update at 1, 27.

¹⁷ US Department of Interior. USFWS. Technical Review: Smoky Canyon Mine Site-Specific Selenium Criterion Report. January 2012 at 3-4. Attached.

¹⁸ Letter to Diane E. Frankel, USEPA Region 9, from Wayne S. White, Field Supervisor, USFWS. Subject: Selenium and Sulfate-Interference. October 10, 1997 at 1. Attached.

duration and too simple in design to mimic this progression from selenate-dominated water to a complex mixture of multiple chemical species of selenium that characterizes the ecotoxicology of selenium in the real world.”¹⁹

Remarkably, DOW’s Update to Kentucky Water Quality Standards for Protection of Aquatic Life: Acute Selenium Criterion and Tissue-Based Selenium Chronic Criteria (“Update”) also cites the Hansen et al. 1993 article but fails to include the authors’ conclusion – that there is insufficient evidence to justify the consideration of sulfate as a factor in the regulation of Se in aquatic environments.²⁰ Similarly, while the Update cites an earlier 1989 Ogle and Knight article, it fails to review their 1996 article that concludes “there is not a reasonable scientific basis to expect the sulfate concentrations in the study area to make any difference with regards to a site-specific selenium criterion.”²¹ The Update also references Brix et al 2001a.²² That study was done in a laboratory setting not in the field and thus is not appropriate in setting selenium criteria. In short, the inclusion of a sulfate factor in Kentucky’s proposed acute selenium criterion is not scientifically defensible and must be withdrawn.

4. The proposed criterion for whole fish tissue is too high

DOW is proposing a whole body fish tissue criterion of 8.6 µg/g that is even higher than the scientifically flawed and highly criticized EPA proposal from 2004.

In 2004, EPA drafted a proposed whole fish tissue criterion of 7.91 µg/g.²³ The Update states that EPA withdrew the draft 2004 criteria based on public comments. Included in those public comments are those by the FWS showing that the proposed criterion was too high and not protective of sensitive species. The FWS stated:

The USFWS has concluded the proposed selenium chronic criterion of 7.91 ug/g in whole body fish tissue exceeds an LC-20 effects target level. In the study cited by EPA as the basis for the 7.91 ug/g proposal (i.e., Lemly 1993), the lowest observed adverse effects (tissue) concentration (LOAEL) was 5.85 ug/g. The USFWS recommends EPA replace the chronic value of <7.91 ug/g for the winter-stress study (Lemly 1993) with a chronic value of <5.85 ug/g. Furthermore, the USFWS notes because 5.85 ug/g appears to be an LC-40 concentration, a tissue-based chronic criterion in the 4-5 ug/g range may be scientifically warranted and would also be consistent with wildlife toxicity data.²⁴

Further, a group of the nation’s leading selenium scientists wrote a white paper vigorously criticizing EPA’s 2004 draft criterion as not protective and too high. The authors discovered

¹⁹ Id at 3.

²⁰ Update at 4 and Id at 3-4.

²¹ Id.

²² See <http://www.ncbi.nlm.nih.gov/pubmed/11337866>.

²³ 69 Fed. Reg at 75,544

²⁴ Letter to Stephan L. Johnson, Administrator USEPA, from Everett F. Wilson, Chief, Division of Environmental Quality USFWS, May 19, 2005. Attached.

several fundamental flaws made by the EPA contractor who developed the criterion, Great Lakes Environmental Center (“GLEC”), that made the proposed tissue criterion unsuitable for any purpose. Those flaws include:

- GLEC misinterpreted the main experiment that drove the criterion. Because of this error EPA has released a draft criterion that, at best, is 50% lethal to juvenile bluegill fish. Even GLEC’s flawed interpretation of the study indicates that the 7.9 ug/g criterion is linked to 33.8 percent mortality of juvenile bluegill. There is no indication of why GLEC did not adjust the criterion downward to meet the target effects level of 20% mortality. Correctly interpreted, EPA’s controlling study indicates a tissue-based chronic criterion for selenium in the 4-6 ug/g range in part dependent on determination of what the acceptable effects level should be. Note: a 0-10% effects level has been EPA’s traditional goal for aquatic life water quality criteria.
- GLEC made crucial statistical errors. Employing appropriate statistics, the authors of this review estimate that a whole-body tissue-based chronic criterion for selenium of 7.9 ug/g would allow fish reproductive tissues to attain selenium concentrations (21.7-27.4 ug/g) exceeding even the most permissive toxicity threshold proposed to date (17 ug/g) by approximate 30-60% and to exceed the more cautious threshold (10 ug/g) recommended by the public-service scientific community by 117-174%.
- GLEC routinely incorrectly converted selenium tissue concentrations from wet-weight-to-dry-weight.
- GLEC portrayed selenium data from aquatic invertebrates and fish liver tissue from a national database as data from selenium in whole-body fish tissue.

The researchers found that all of the most egregious errors biased the final criterion recommendation toward dangerously overestimating the safely tolerable tissue-based number.²⁵

Sadly, in the face of the extensive and substantive criticism of EPA’s 7.91 ug/g draft criterion as too high, DOW proposes the even higher and less protective number of 8.6 ug/g.²⁶ DOW’s flawed criterion is due, in part, to several serious scientific errors in the Update document including:

- use of Guidelines for Deriving Numerical National Water quality Criteria for the protection of Aquatic Organisms and their Uses²⁷ that was not intended for use with bioaccumulative toxins,²⁸

²⁵ Joseph P. Skorupa, USFWS, Theresa S. Presser, USGS, Steven J. Hamilton, USGS, A. Dennis Lemly, USFS, Brad E. Sample, CH2M HILL. EPA’s Draft Tissue-Based Selenium Criterion: A Technical Review. Spring 2004. Attached.

²⁶ Update at 28

²⁷ Update at 9

²⁸ Letter to Stephan L. Johnson, Administrator USEPA, from Everett F. Wilson, Chief, Division of Environmental Quality USFWS, May 19, 2005. Attached.

- rejection of the Lemly winter stress study based on several scientifically unjustified claims, including: 1) reliance on the conclusions in the McIntyre et al. 2008 study even though the study did not induce winter stress, in part, because the study did not control photoperiod or discuss the impacts that the lack of photoperiod controls may have on the interpretation of study results;²⁹ 2) claims that the Hermanutz et al. 1996 and Hamilton et al. 2002 studies mimic the winter stress study because they include winter conditions. The studies do not mimic the winter stress study because they do not control photoperiod and because the studies used adult fish. Thus, these studies do not refute the conclusion or data in the Lemly winter stress study;
- use of an all species equation used to translate whole body to egg/ovary numbers despite significant differences in the species compartmentalization between whole body and egg ovary;³⁰
- failure to include data on catfish including the catfish component of the Doroshov study despite the wide presence of catfish in Kentucky;³¹
- use of four fish species of varying tolerances to calculate the final whole fish criterion as opposed to basing the criterion on the most sensitive species.³²

5. The proposed criterion for egg/ovary tissue is too high

DOW is proposing an egg/ovary fish tissue criterion of 19.33 ug/g that is even higher than the scientifically flawed EPA proposal from 2010. In part, this is for all the same reasons noted above for the whole body criterion. The result is a criterion that will not protect selenium-sensitive species important to Kentucky such as bluegill and catfish.

The 2010 EPA draft showing EPA's preliminary consideration of an egg/ovary criterion proposed:

The concentration of selenium in the eggs or ovaries of fish should not exceed 17.07 mg/kg dry weight, or the 30-day average concentrations of selenium in water should not exceed 2.6 µg/L in flowing waters and 1.3 µg/L in impounded waters and other lentic systems.³³

That egg/ovary number, which is lower than the limit proposed by DOW, was severely criticized by experts from other agencies as unprotective when put out for peer review by EPA. In addition, the water column criteria proposed by DOW are substantially higher than the water

²⁹ For a detailed critique of the McIntyre study, see Letter to Charles Delos, USEPA, from Margaret Janes, Appalachian Center for the Economy and the Environment, RE: Docket ID No. EPA-HQ-OW-2004-0019. November 24, 2008. Attached with exhibits.

³⁰ Osmundson, Barbara C. USFWS. Poster. Selenium in Fish tissue: Prediction Equations for conversion between Whole Body, Muscle, & Eggs. Attached.

³¹ See Update at Table 1

³² Update at 26.

³³ EPA draft early notice of availability for selenium WQC 2010. Attached.g

column criteria (2.6 µg/L in flowing waters and 1.3 µg/L in impounded waters) that accompanied EPA's rejected egg/ovary criteria.

One major flaw with the egg/ovary criterion is that it will not protect sensitive species. In a letter expressing concern over the preliminary egg/ovary criterion to EPA from Dennis Lemly of the USDA Forest Service, Dr. Lemly concluded that EPA's inclusion of more tolerant species in the criterion evaluation and development resulted in a proposed criterion that would have allowed mortality to exceed allowable limits in more sensitive species. Dr. Lemly stated that scientific studies show:

quite clearly that a criterion of 17.07 mg/kg for fish eggs/ovaries will jeopardize two of the most important freshwater fish families in North America: Centrarchidae and Ictaluridae. For example, (1) An EPA field study published in the peer reviewed journal *Environmental Toxicology and Chemistry* (Hermanutz et al 1992) found that ovary selenium concentrations of 9 mg/kg dw or greater resulted in 40% higher mortality and 80% more edema in larval bluegill sunfish that controls or an EC₄₀₋₈₀ (converted from wet weight using 80% moisture, based on mean wet weight +/- one standard deviation). The results of this study are not included in EPA's draft criterion calculation, and (2) A laboratory study at the University of California (Doroshov et al. 1992) found that the EC₅₀ for larval mortality of channel catfish and bluegill sunfish occurred at egg selenium concentrations of 7.2 and 15.0 mg/kg dw respectively (lower limit of 95% confidence intervals). These mortality data were not included in the data used to derive the FCV.

...
Extensive field data from the Belews Lake case example, which includes reproductive analysis from young o-of-the-year stock assessment, clearly show that catfish are very sensitive selenium poisoning in a real-world setting. . .equal to or greater than sunfish (Cumbie 1978, Cumbie and Van Haron 1978, Holland 1979, Garrett and Inman 1984, Lemly 1985). The criterion document does not present or discuss the Belews Lake data, and does not cite several key references in its bibliography (e.g. Cumbie 1978, Holland 1979, Garrett and Inman 1984).

...
The FCV needs to be lower than 10 mg/kg dw in order to protect sunfish and catfish at an EC₁₀ level, which is the level of protection afforded to trout by the 17.07 draft criterion value. It is also important to understand that an EC₁₀ is not fully protective of any species.....it allows 1 out of every 10 individuals to die from selenium poisoning.³⁴

In the same letter, Dr. Lemly confirms that EPA's proposed water column criteria, much lower than DOW's proposed numbers, are "environmentally sound."

³⁴ Letter to Mr. Joseph Beaman, Chief, USEPA, Office of Water, Ecological Risk Assessment Branch, Washington, DC from A. Dennis Lemly, Ph.D., Research Fish Biologist, USDA Forest Service, Southern Research Station, Piedmont Aquatic Research Laboratory. July 6, 2010 at 1-3. Attached

Selenium-sensitive sunfish and catfish are common throughout Kentucky.³⁵ Those and other sensitive species will not be protected by DOW's proposed egg/ovary criterion of 19.3 ug/g, which is even higher than the flawed EPA criterion and much higher than levels that leading selenium experts recommend.

6. The proposed tiered approach would allow harmful bioaccumulation of selenium and would not protect all aquatic life

The tiered approach uses the existing 5 µg/L chronic selenium criterion merely as a screening threshold. Pursuant to the proposal, if the water column concentration is ≤ 5 µg/L, then the water body is meeting its aquatic life use and evaluation of fish tissue is unnecessary. If the water column is > 5 µg/L then whole fish or egg/ovary tissue is collected. Only if the *species-composite* fish tissue exceeds the chosen tissue-based criterion, is the water body considered in non-attainment of the water quality standard.³⁶

In addition to relying on fish tissue criteria that are too high, the tiered approach is flawed for a number of other reasons:

- It exempts fishless streams from the criterion so that other aquatic organisms such as salamanders, crayfish, or insects³⁷ have no protection from chronic selenium toxicity;
- If sensitive species have already been extirpated, the tiered approach will miss that extreme impairment;
- The approach calls for composite samples of an entire species that will miss the variation and individual differences and toxicity within a species depending on, among other things, age, individual diet, areas of forage and duration of stay in polluted waters. Use of a composite sample is not scientifically defensible for evaluation of impacts on a given species. If a composite sample exceeds the proposed criteria it will help assure that the reproductive capabilities of sensitive species will collapse. This is illustrated by selenium's sharp toxicity curve, which shows that once significant bioaccumulation of selenium occurs, tiny increases in selenium will result in total collapse of reproduction.³⁸

Further, fish are just one component of a healthy aquatic life community that must be protected by water quality standards. See 401 KAR 10:001(40) (defining "Indigenous aquatic community" as "naturally occurring aquatic organisms including bacteria, fungi, algae, aquatic insects, other aquatic invertebrates, reptiles, amphibians, and fishes"). DOW assumes fish are

³⁵ See <http://www.aa-fishing.com/ky/kentucky-panfish-fishing.html> and <http://www.aa-fishing.com/ky/kentucky-catfish-fishing.html>

³⁶ Update at 28 (emphasis added).

³⁷ See

<http://pubs.acs.org/doi/abs/10.1021/es062253j?journalCode=esthag&quickLinkVolume=41&quickLinkPage=1766&selectedTab=citation&volume=41>

³⁸ Declaration of A. Dennis Lemly. Aquatic Hazard of Selenium Releases from Coal Mining in the Mud River Ecosystem, West Virginia, 3:08-cv-00088 at 8. Attach.

the most sensitive aquatic group³⁹ but fails to consider that some species such as mollusks have not been adequately assessed. Certain waters lack fish, but support other aquatic life that could be seriously harmed by selenium pollution. For example, even a study in 2007 by an expert who frequently testifies and defends the coal industry showed that selenium had important impacts on macroinvertebrates and that, “sublethal effects occurred at 1–30 µg Se/g dry weight in invertebrate tissue, a range that encompasses proposed dietary thresholds for toxicity to fish and water birds, suggesting that Se may cause toxic effects in some invertebrate species at concentrations considered to be ‘safe’ for the organisms consuming them.”⁴⁰ In a 2009 study, researchers also showed that benthic organisms are harmed by exposure to selenium. “These results suggest that at environmentally feasible dietary Se concentrations insects are potentially affected by Se exposure, and that the current presumption that insects are simply conduits of Se to higher trophic levels is inaccurate.”⁴¹ Furthermore, in certain streams, selenium and other pollution may have already extirpated many or all fish species, but other aquatic life may remain in or recolonize those waters. Because selenium can have relatively subtle effects restricted primarily to reproduction, a watershed poisoned by selenium may have no fish remaining. In those streams and other streams with no fish populations, therefore, solely focusing on the harm to fish misses the harm to other aquatic organisms.

Additionally, aquatic insects that ingest selenium in the upper reaches of the watershed are often consumed by fish and other organisms downstream. Because selenium bioaccumulates, insects with high selenium levels inevitably harm fish and other organisms downstream.

Further, if there is significant bioaccumulation in the food web, even if water column numbers drop below 5 µg/L, it will take years for fish and other aquatic life to recover. Nonetheless, DOW is proposing a criterion that will not protect aquatic life in these cases. The DOW proposal states, “[i]f the water column concentration for total selenium is <_5.0 µg/L the water body is meeting its aquatic life use.”^{42,43} This means that additional loads of selenium could be discharged to a waterway adding to food web selenium concentrations as long as the instream concentration does not exceed 5 µg/L, even where fish tissue values exceed the proposed criterion and aquatic life are suffering adverse impacts.

The notorious example of selenium contamination at Belews Lake, North Carolina, shows why this approach is not scientifically defensible. A study done in 1996, ten years after all selenium inputs to the lake had stopped, showed that toxic impacts to aquatic life, including deformities, were still occurring. The researcher summarized his findings:

³⁹ Update at 28.

⁴⁰ See

<http://pubs.acs.org/doi/abs/10.1021/es062253j?journalCode=esthag&quickLinkVolume=41&quickLinkPage=1766&selectedTab=citation&volume=41>

⁴¹ Conley, Justin M. Funk, David H. Buchwalter, David B. Selenium Bioaccumulation in the Mayfly *Centroptilum triangulifer* in a Life-Cycle, Periphyton-Biofilm Trophic Assay. *Environmental Science and Technology*. 2009. 43. At 7952. Attached.

⁴² Id.

⁴³ Also see comments on acute criteria and persistence of impacts with selenium spikes.

Hazard ratings indicate that high hazard existed prior to 1986 and that moderate hazard is still present, primarily due to selenium in the sediment-detrital food pathway. Concentrations of selenium in sediments have fallen by about 65–75%, but remain sufficiently elevated (1–4 µg/g) to contaminate benthic food organisms of fish and aquatic birds. Field evidence confirmed the validity of the hazard ratings. Developmental abnormalities in young fish indicate that selenium-induced teratogenesis and reproductive impairment are occurring. Moreover, the concentrations of selenium in benthic food organisms are sufficient to cause mortality in young bluegill and other centrarchids because of Winter Stress Syndrome. At the ecosystem level, recovery has been slow. Toxic effects are still evident 10 years after selenium inputs were stopped. The sediment-associated selenium will likely continue to be a significant hazard to fish and aquatic birds for years.⁴⁴

7. The proposed chronic fish tissue criteria are effectively unenforceable and are not compatible with meaningful development of effluent limitations in KPDES permits

Water quality criteria are important tools for measuring whether water bodies are meeting the uses mandated by the CWA. Equally important is their use as the basis for establishing enforceable controls on water pollution to further the CWA's goal of "restor[ing] and maintain[ing] the chemical, physical and biological integrity of the nation's waters."⁴⁵ DOW has not explained how it intends to incorporate the proposed criteria into enforceable measures needed for KPDES permit limits, TMDLs, and other pollution control decisions required by the Clean Water Act.

The DOW proposal is so vague as to be meaningless. Because DOW has left its procedures to the imagination, its proposal cannot be approved by EPA. It is clear, though, that the proposal is in irreconcilable conflict with the basic principles of the CWA. We see no way that DOW can use its proposed criteria to set permit limits for new operations. How, for example, will DOW determine the "reasonable potential" for a proposed new discharge to cause or contribute to violations of the fish tissue criteria? When do permit limits begin? Where will sampling of fish occur? What fish taxa will be used? If there is a "reasonable potential," when must treatment start? How will appropriate effluent limits be determined? How would the loss of fish species from past pollution be accounted for in permit renewals? We do not believe that DOW has addresses those or other issues critical to implementation of the new criteria. The lack of any indication of how the criteria will be implemented show that they cannot be reconciled with the Clean Water Act.

We speculate that if DOW actually begins to incorporate the proposed criteria into KPDES permits, DOW would develop a permit condition that included the 5 µg/l screening level and

⁴⁴ Lemly, A. Dennis. Ecosystem Recovery Following Selenium Contamination in a Freshwater Reservoir. *Ecotoxicology and Environmental Safety*. (1997) 36:275-281 at Abstr. Attached.

⁴⁵ See 33 U.S.C. § 1251(a).

maximum allowable fish tissue levels. DOW would only mandate a reduction in selenium discharges if both water and fish tissues exceeded maximum levels. If only one was exceeded, no action would be required. Remarkably, DOW would not require a reduction in the water column level and selenium loads even in the face of significant bioaccumulation that the agency admits will be harmful. Significant questions remain on how these criteria could be legally implemented if sensitive species are already extirpated.

By adopting fish-tissue criteria in lieu of a standard chronic water column criterion, DOW has effectively removed the only proven, practical means of implementing the Clean Water Act. DOW has specific, federally-approved procedures for how to convert water column criteria to enforceable restrictions on wastewater discharges, in addition to the technical guidance, training and other materials on scientifically valid models, necessary background data, sampling protocols, and acceptable laboratory techniques for the implementation of traditional water column criteria that EPA has provided. DOW's proposed criteria will require a case-by-case analysis of the local ecosystem, which will require significant resources. Given DOW's past performance, this is extremely unlikely to occur.

Furthermore, DOW does not suggest the frequency/duration of excursions $> 5 \mu\text{g/l}$ needed to trigger fish tissue sampling, what frequency of monitoring should be required or the laboratory techniques or quality control and quality assurance procedures to be followed. Nor does it indicate the season or types, numbers, gender, state of health, or age of fish to be sampled. The proposal does not address restrictions on sampling locations or preferred means of gathering fish for sampling. All of the above are critically important in assessing the bioaccumulation of selenium in an aquatic ecosystem, however, and many of these points will be disputed at length by selenium dischargers unless they are clearly spelled out by the agency before new criteria are adopted.

In addition, DOW has not suggested how or if sampling would be conducted in the absence of thriving fish populations. This point is particularly important since one of the well-established toxic effects of selenium is impaired reproduction. If EPA relies solely on fish-tissue sampling to determine compliance, violations may not be proven until fish populations have already declined, as they did at Belews Lake. This is particularly troubling because selenium lingers in the aquatic ecosystem for years once concentrations in fish tissue rise to harmful levels.

Reliance on a fish-tissue standard is a significant departure from DOW's past practice and presents challenging problems – problems which DOW has not addressed in its current proposal. In passing the CWA, Congress recognized the fact that water quality standards – which existed prior to 1972 – would not, of themselves, protect and improve water quality. Accordingly, Congress established the National Pollutant Discharge Elimination System (NPDES), providing a mechanism for clear application and enforcement of water quality standards.⁴⁶ Further frustrated with a lack of progress in realizing the promise of narrative water quality goals, Congress again amended the Act in 1987, at that time requiring the development and

⁴⁶ Kentucky's federally-approved analog is known as the Kentucky Pollutant Discharge Elimination System (KPDES).

application of numeric criteria for waterways affected by toxic pollutants. These revisions clearly illustrate Congress' intent to assure that water quality standards and goals are specific and translated into necessary, enforceable controls on pollution sources. DOW's proposed criteria are at odds with that clear intent.

8. The proposed criteria will not protect wildlife dependent on aquatic habitat for survival

The Clean Water Act mandates that water quality standards protect not only fish, but all aquatic organisms and other wildlife that depend on healthy streams. Section 303(c) governs state revisions to water quality standards and requires that such standards "shall be established taking into consideration their use and value for . . . propagation of fish *and wildlife*," among other things. 33 U.S.C. § 1313(c)(2)(A) (emphasis added); *see also* 33 U.S.C. § 1252(a) (directing states to develop comprehensive programs for controlling water pollution giving due regard to improvements necessary to "conserve such waters for the protection and propagation of fish and aquatic life and wildlife"). EPA's regulations require states to develop standards that will "[s]erve the purposes of the Act," meaning that they will "provide water quality for the protection and propagation of fish, shellfish *and wildlife*," among other things. 40 C.F.R. § 131.2 (emphasis added). Kentucky's water quality standards regulations likewise require that surface waters be protected "for the propagation of fish *and aquatic life, for fowl, [and] animal wildlife*," among other legitimate uses. *See* KRS 224.70-100(1) (stating the Commonwealth's policies for conservation of water resources); 401 KAR 10:026 (mandating that Kentucky's surface waters be protected for all legitimate uses contained in KRS 224.70-100(1)).

Because DOW's proposed chronic criteria only look at fish tissue concentrations, they fail to protect other wildlife that depend on aquatic habitat for food sources other than fish. A group of the nation's leading selenium scientists wrote a white paper vigorously criticizing EPA's 2004 draft criterion, which, again, is more protective than DOW's proposed criteria, as not protective and too high. The authors explained the history of the flawed number:

During the past 17 years numerous researchers including those funded by EPA have estimated that the toxicity threshold for selenium lies below the current chronic aquatic life criterion of 5 µg/L. Recently, corporate interests have claimed that 5 µg/L is overly restrictive. Because of an endangered species issue in California, EPA agreed to re-evaluate their CWA criteria guidance for selenium by 2002. This was problematic because:

- EPA's normal procedure for setting Aquatic Life Criteria does not directly consider toxicity data for aquatic-dependent wildlife
- EPA has promulgated no separate wildlife criteria for selenium.
- EPA's normal procedure for setting criteria is better suited to non-bioaccumulative pollutants – selenium is bioaccumulative.
- ESA-listed species every individual of a population "counts" and therefore criteria guidance would need to be fully protective at an individual-effects level.

EPA contracted with the Great Lakes Environmental Center (GLEC) to derive the new selenium criteria. GLEC was instructed to derive the chronic criterion on a fish-tissue basis rather than on a water concentration basis. The GLEC derived criterion was released in March 2002. The draft tissue-based chronic criterion, of 7.9 µg/g, dry weight basis, assumed 20% of the target population would die. The USFWS asked EPA to not promulgate the criterion because it wasn't protective of endangered species.⁴⁷

The authors noted significant additional flaws in EPA's proposed criterion that would lead to harm to wildlife, including threatened and endangered species:

GLEC's assessment of risk to aquatic-dependent wildlife was based on an erroneous draft wildlife toxicology report. The draft tissue-based chronic criterion for selenium of 7.9 µg/g would leave a substantive proportion of aquatic-dependent wildlife species unprotected; on the order of half the species. Aquatic life criteria are considered by EPA to be separate and distinct from wildlife criteria. Nonetheless, in the absence of promulgated wildlife criteria (as is the case for selenium), if the aquatic life criteria do not protect wildlife the purposes of the CWA are not being met. More critically, for waters of the United States supporting ESA-listed aquatic-dependent wildlife, the criteria would not be approvable for incorporation into state or tribal water quality standards.⁴⁸

Those experts estimated that EPA's previously proposed criterion would have caused reproductive impairment in, conservatively, 40% and possibly as high as 95% of exposed mallard ducks.⁴⁹ Reproductive impairment occurs if ducks are exposed through a contaminated diet during the development of their chicks. Mallard ducks are ubiquitous, breeding near and relying on aquatic resources throughout the US. They are primarily vegetarians eating seeds of grasses and sedges and the leaves, stems and seeds of aquatic plants. They occasionally eat insects, crustaceans and mollusks, especially when they are young.⁵⁰ While the ducks do not eat fish, "allowing fish tissue to reach 7.9 ug/g would allow a level of contamination in the other parts of the aquatic ecosystem sufficient to cause nearly total reproductive failure among mallard ducks."⁵¹ Other species such as the Louisiana Water Thrush or Indiana bat may also be harmed by eating flying insects or benthic macroinvertebrates that are seriously contaminated with selenium.

⁴⁷ Joseph P. Skorupa, USFWS, Theresa S. Presser, USGS, Steven J. Hamilton, USGS, A. Dennis Lemly, USFS, Brad E. Sample, CH2M HILL. EPA's Draft Tissue-Based Selenium Criterion: A Technical Review. Spring 2004. at 2-3. Attached.

⁴⁸ Id.

⁴⁹ Lemly (1997) at p. 22.

⁵⁰ <http://www.nhptv.org/natureworks/mallard.htm>

⁵¹ Joseph P. Skorupa, USFWS, Theresa S. Presser, USGS, Steven J. Hamilton, USGS, A. Dennis Lemly, USFS, Brad E. Sample, CH2M HILL. EPA's Draft Tissue-Based Selenium Criterion: A Technical Review. Spring 2004. at 22 Attached.

DOW has entirely failed to consider the impacts of its proposed criteria on wildlife that are dependent on healthy streams. Water-dependent wildlife will not be protected because the criteria are too high and because the chronic, fish tissue-based criteria are entirely unenforceable in streams that lack fish.

9. EPA will not be able to approve the criteria because of their impacts on threatened and endangered species

Although, DOW does not have obligations under the Endangered Species Act related to its revision of water quality standards, EPA's approval of those standards, required by 40 C.F.R § 131.21, does trigger the requirements of the ESA. USEPA, USFWS, and the National Marine Fisheries Service have a Memorandum of Agreement (MOA) that governs protection of endangered and threatened species under Section 7 of the Endangered Species Act, 16 U.S.C. § 1536, in regard to, among other things, revisions to water quality standards.⁵² EPA has stated that "where approval of new or revised standards may have an effect on a listed species or designated critical habitat, consultation under section 7(a)(2) [of the ESA] is required. . . . [W]ater-dependent endangered and threatened species are an important component of the aquatic environment that the CWA is designed to protect, and steps to ensure the protection of those species are well within the scope of the CWA."⁵³

Kentucky supports numerous federally-listed threatened and endangered species, including fish species and wildlife dependent on healthy streams.⁵⁴ As USFWS's strident criticism of EPA's proposed and withdrawn standards shows, DOW's proposed criteria fail to adequately protect organisms that depend on aquatic habitat for survival. Those criteria are likely to jeopardize threatened and endangered species and thus cannot be approved by EPA. See 16 U.S.C. § 1536(a)(2). Because EPA cannot approve the proposed criteria, it would be futile for DOW to submit those criteria without modifying them to ensure that they are protective of threatened and endangered species.

Conclusion

In sum, DOW's proposed criteria rely on flawed, discredited science, will not protect fish, aquatic life, or other wildlife, and are effectively unenforceable. Furthermore, DOW has failed to follow important, mandatory public participation procedures and has thus deprived the public of an opportunity to develop complete comments on the proposed criteria. We ask that the Subcommittee recommend that the Cabinet defer the regulations. We ask DOW to, upon consideration of these comments, abandon its effort to unjustifiably weaken the protections on the Commonwealth's waters and to require the coal industry to satisfy its obligations under the Clean Water Act.

⁵² 66 Fed. Reg. 11202 (Feb. 22, 2001).

⁵³ *Id.* at 11,206.

⁵⁴ <http://fw.ky.gov/telst.asp>.

Sincerely,

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