

MINUTES
REGULATORY ADVISORY PANEL MEETING
Selenium Site-Specific Criteria

Buchanan Co. Public Library
1185 Poe Town Street
Grundy, VA 24614
April 24, 2024
Start Time: 9:30 am

Advisory Panel Members and Alternates Present:

- Matt Hepler, *Appalachian Voices*
- Braven Beaty, *The Nature Conservancy (TNC)*
- Shelley Surles, *Metallurgical Coal Producers Association (MCPA)*
- Tim Browning, *Artemis Consulting Services, LLC (representing Clintwood JOD, LLC)*
- Serena Ciparis/JoAnn Banda, *US Fish & Wildlife Service (USF&WS)*
- Jared Worley, *VA Department of Energy (VA Energy)*
- Jeff Williams, *Dept. of Wildlife Resources (DWR)*
- Dr. C. Andrew Dolloff, *Self*

DEQ Staff Present:

From Central Office: Bryant Thomas (Facilitator), Dr. Tish Robertson, David Whitehurst
From Southwest Regional Office: Jeffrey Hurst, David Nishida, Martha Chapman

Overview and Discussion of Triennial Review Potential Amendments

Mr. Thomas, Office of Ecology Manager, opened the meeting with introductions, purpose of the meeting and expectations of the Regulatory Advisory Panel (RAP, or Panel). The slides used to present information and guide the RAP meeting are included as Attachment 1 to these minutes. Mr. Thomas explained that the RAP is a public body subject to the Freedom of Information Act (FOIA). Mr. Whitehurst then reviewed the rulemaking process and expected timeline for this rulemaking.

Mr. Thomas then explained to the RAP that this rulemaking is at the direction of the State Water Control Board (Board). The Board had received a petition from Clintwood JOD, LLC that requested promulgation of site-specific selenium criteria for four (4) tributaries to Knox Creek in Buchanan County. The petition had two requests: (1) that the Water Quality Standards (WQS) regulation be amended to include site-specific criteria which incorporate the U.S. Environmental Protection Agency's (EPA) most recently recommended (2016) freshwater selenium criteria; (2) that implementation follow guidance used by West Virginia. Mr. Thomas then explained that the rulemaking will address amending the WQS regulation, and that would be the focus of discussion for this RAP meeting. It was noted that implementation procedures are not within the scope of the rulemaking; rather, implementation procedures will be developed by water quality programs implementing the criteria. In the case of Virginia Pollutant Discharge Elimination System (VPDES permit guidance, this falls under the purview of

the VA Department of Energy (VA Energy), as they are the permitting authority for surface coal mining operations. VA Energy confirmed that guidance would be developed to implement the Se criteria. The guidance would be developed separately from the subject rulemaking, but on a parallel track considering the schedule of the rulemaking.

Dr. Tish Robertson then presented an overview of aquatic life criteria and explained that water quality criteria have three components: magnitude, duration, and frequency (of exceedance). Dr. Robertson then gave an overview of EPA's 2016 recommended selenium criterion, which is expressed both in terms of fish tissue concentration (egg/ovary, whole body, muscle) and water concentration (lentic, lotic). She explained the hierarchical nature of the criterion and that the order of primacy is as follows: Fish tissue (egg/ovary) → Fish tissue (whole body or filet) → water column.

Dr. Robertson pointed out that the 2016 selenium aquatic life criteria recommendation is unique in that it has a fish tissue component. All other aquatic life criteria are based on measurement of pollutant concentrations in the water column.

Dr. Robertson then presented to the group proposed language to amend the WQS, which incorporates EPA's 2016 criteria recommendation. Dr. Robertson identified the two locations in the WQS regulation where the proposed, amended regulatory language would be incorporated. The first would be into section 9VAC25-260-310 (Special standards and requirements) as special standard "jj". The second would be to include the special standard notation "jj" in Section 3 of the Tennessee and Big Sandy River Basins table at 9VAC25-260-490. This notation alerts the reader that there is a site-specific standard in the described waterbody section and refers them to special standard "jj" in Section 310 of the regulation

The floor was then open for discussion.

Discussion

Dr. Dolloff asked how a "site" is defined regarding criteria application and if some portion of Knox Creek would be assessed according to the criteria.

DEQ Response: The intent is for the criteria to only be applicable to the four streams identified in the petition: Race Fork and tributaries, Pounding Mill, Right Fork of Lester Fork, Abner's Fork, and their respective tributaries.

Ms. Ciparis (USF&WS) asked why DEQ was moving forward now after eight years since EPA's 2016 selenium criteria were recommended.

DEQ Response: Until recently, EPA did not have final implementation guidelines for the recommended criteria. As these criteria are unique regarding establishment of fish tissue criteria concentrations, implementation into established water quality programs is important. The petitioner has requested the State Water Control Board to adopt the

criteria in a limited geographic area. DEQ agrees that it is appropriate to take a limited and measured approach, as a pilot project, to implementing these criteria.

Dr. Dolloff asked if the selenium water column values are more stringent than current criteria, and the sample size for evaluating against the criteria.

DEQ Response: The question entails specific implementation procedures for how VPDES permits or water quality assessments would evaluate the proposed criteria. This is beyond the scope of the rulemaking. However, it was noted that there are normally multiple samples involved in assessing a chronic water quality criterion.

Mr. Beaty (TNC) asked for clarification on the speciation of selenium and if the dissolved total selenium includes all species of the compound, and if there is an option of choosing to use tissue data vs water column data?

DEQ Response: Yes, the dissolved total selenium value for the water column criterion includes all forms of selenium. Fish tissue data takes primacy if there is enough acceptable data. If tissue data is absent, then water column data is used.

Mr. Beaty inquired how much of the watershed is impacted by discharges.

Group Discussion: Most of the watersheds identified by the petitioner are impacted by surface coal mining operations.

A question was asked whether other dischargers in the subject watersheds, not the petitioner, would be able to use the existing selenium criteria in the WQS regulation.

DEQ Response: No, if EPA's 2016 recommended criteria are adopted, they would supersede the existing water quality criteria and be applicable in the specific watersheds addressed by the rulemaking.

A question was posed as to how it is determined if selenium inputs to a waterbody are "steady-state"?

Group Discussion: It was first noted by DEQ that defining steady-state would be established in guidance development for water quality programs. Discussion of the topic indicated steady-state may consider stability or consistency of fish tissue monitoring data over a period of time as well as considering new or additional inputs or discharges of selenium in the subject watershed. Ms. Surles (MCPA) also shared that West Virginia (WV) makes steady state determinations during permit review and considers a steady-state to occur six months after a new discharge occurs in a waterbody. Ms. Surles discussed, as an example, how WV uses the water column

concentration end-points as a default when conducting permit evaluations if fish tissue data are not available or steady-state conditions do not exist.

Dr. Dolloff asked about Total Maximum Daily Load (TMDL) determinations.

DEQ Response: A TMDL is established to address an impairment where a waterbody is not meeting a designated use. In the case of selenium, it would be an aquatic life use impairment due to fish tissue levels exceeding the applicable criterion. While the question pertains to implementation guidance, it would be much further down the road if an impairment were ever identified for the subject waterbodies. DEQ staff indicated that TMDLs establish wasteload allocations for dischargers which limit pollutant loadings into a waterbody, and that other TMDL studies to address fish tissue impairments had incorporated site-specific bioaccumulation factors as opposed to the default values incorporated into EPA's recommended criteria.

Ms. Ciparis (USFWS) asked what is considered "30-days" with regard to the intermittent exposure component of the criteria? Is it a rolling 30-day period or distinct 30 calendar days?

Group Discussion: Mr. Worley (VA Energy) responded by indicating that current discharge monitoring for VPDES mining permits is on a monthly basis. It was pointed out that this issue was within the realm of implementation which has yet to be fully developed for these criteria.

Mr. Beaty (TNC) expressed concerns that impacts to headwaters may not be seen further downstream. He also is concerned that fish tissue concentrations well downstream of the Se impact location may not fully protect native stream biota due to dilution or assimilation processes in the intervening distance. The challenge involves ensuring that any fish tissue measures are appropriately representative of the receiving stream proximate to the Se input. How do we make sure that fish tissue data collected in downstream waters is representative and protective of the entirety of the stream? What about aquatic macroinvertebrates and/or salamanders in potentially fishless headwaters?

Group Discussion: Mr. Browning (Artemis) shared that EPA developed the criteria using fish as the organisms that are most sensitive to the effects of selenium. If the downstream fish tissue data meets the criteria, upstream portions are likely to be protected. Ms. Ciparis (USFWS) added that fish are the most sensitive organisms with respect to bioaccumulation. DEQ also noted the ecological connection of the organisms in the food web and that upstream impacts, such as toxicity, may be revealed in downstream locations. Mr. Beaty noted that the range of taxa evaluated is very limited, particularly outside of fish. There is virtually no data available for native amphibians, crayfish, etc. that occupy headwater streams.

There were a number of questions regarding permitting and compliance issues, to include how a permittee would demonstrate compliance with fish end-points when there are multiple dischargers, what would be the frequency of monitoring required for dischargers within a 30-day period and would DEQ collect fish samples in the watershed.

DEQ and VA Energy Response: The questions and issues raised are all important, but within the realm of implementation guidance and not within the scope of the rulemaking. That said, there were general answers provided by both DEQ and VA Energy. Regarding a circumstance with multiple dischargers, the WQS for selenium would be established to protect the aquatic life designated use. If there are exceedances of the criteria, then all dischargers would be evaluated for possibly contributing to the exceedance.

Regarding sampling to demonstrate compliance with a 30-day limit, VA Energy staff provided an example of compliance monitoring for a 30-day effluent limit in VPDES permits which entailed a minimum of two samples collected at least seven days apart. That may not be how the compliance monitoring requirements for selenium end-points are established in permits, but is an example. Regarding permit compliance monitoring, self-monitoring and self-reporting was noted as a cornerstone component of the VPDES program with well-established precedence and procedures.

Ms. Surles commented that the selenium water column concentrations are calculated to be low enough to avoid deformities in fish and that self-monitoring reporting requirements are very stringent with serious consequences if those requirements are not met.

Lastly, regarding DEQ monitoring of fish tissue in the watershed, it was noted that DEQ conducts routine monitoring of fish tissue for contaminants in edible fillets. DEQ has sampled in the Knox Creek watershed historically and would likely sample this watershed again in future sampling rotations. However, there are no current plans or commitments.

It was asked if the section in the river basin table with the “jj” notation could be modified for specificity and name the four tributaries to Knox Creek to which the criterion would be applicable?

DEQ Response: The language in the basin table (section 3 of 9VAC25-260-490) could be modified. However, the proposed notation refers the reader back to the Section (9VAC25-260-310) which gives exact geographic descriptions for all the site-specific criteria and where they are applicable. The language, as proposed, would be consistent with other sections of the regulation where special standards exist.

Ms. Ciparis (USFWS) asked if there will be an opportunity to comment on implementation guidance and when?

VA Energy Response: Mr. Worley indicated that, yes, there will be a comment period for draft guidance once it has been developed.

Dr. Dolloff asked who (which state agency) oversees the discharge permits?

DEQ Response: While DEQ has the responsibility and authority to oversee VPDES permitting throughout Virginia, the exception is for surface coal mining operations. VA Energy has responsibility for managing VPDES discharge permits for surface coal mining operations.

Mr. Browning (Artemis) inquired whether it would be possible to have the existing selenium water column concentration remain effective while incorporating only the fish tissue end-points of the EPA's 2016 recommended criteria ?

DEQ Response: No, EPA's 2016 recommended criteria are considered a criterion with a hierarchical structure. They need to be adopted in their entirety. Additionally, it is unlikely that EPA would accept this approach, and they have final approval authority for any state-adopted water quality standards.

Ms. Surles (MCPA) asked whether it would be possible to pull out or remove an element of the proposed criteria (fish tissue or water column)? And what if EPA changes their criteria recommendation again in the future.

DEQ Response: Regarding splitting out sections of EPA's recommended criteria, the response above applies in that the criteria need to be adopted in their entirety, and it is unlikely EPA would approve just one element of the criteria. If EPA were to make changes in the future regarding nationally recommended selenium criteria, state WQS criteria do not automatically follow suit. If Virginia decides it is necessary to adopt those updated criteria, another rulemaking will need to be initiated. DEQ periodically updates the WQS regulation to reflect updated science, policy and recommendations from EPA. This is done under the Triennial Review process planned to occur on a three-year cycle.

Dr. Dolloff asked why did the petitioner make this request to adopt the 2016 selenium criteria?

Mr. Browning (Artemis) Response representing the petitioner: Providing the petitioner (CJOD) the option to utilize fish tissue for permit limit derivation allows flexibility in demonstrating compliance with permit requirements. While it is possible that compliance end-points may be more stringent, as the water column concentration end-points of EPA's 2016 recommended criteria are lower than the current criteria, the additional flexibility in complying with permit requirements is a benefit.

Upon completion of the discussion, Mr. Thomas asked the RAP members if they had reached consensus with regard to the proposed regulatory language in the WQS as presented by DEQ staff. Consensus was discussed early in the meeting to reflect that RAP members could live with the proposal. There was no opposition expressed specific to the proposed language amending the WQS regulation.

The meeting was adjourned at 12:30 pm.

ATTACHMENT 1



Water Quality Standards Site-Specific Selenium Criteria Regulatory Advisory Panel Meeting

Bryant Thomas
Manager, Office of Ecology

April 24, 2024

Agenda

- Welcome & Introductions – Bryant Thomas
 - RAP & FOIA guidelines
- Overview of Rulemaking Process and Procedures/Schedule – David Whitehurst
- Petition Request & Current Rulemaking – Bryant Thomas
- Overview of Water Quality Standards, EPA 2016 Selenium Criteria and Site-Specific Regulatory Language - Tish Robertson
- Group Discussion
- Wrap Up

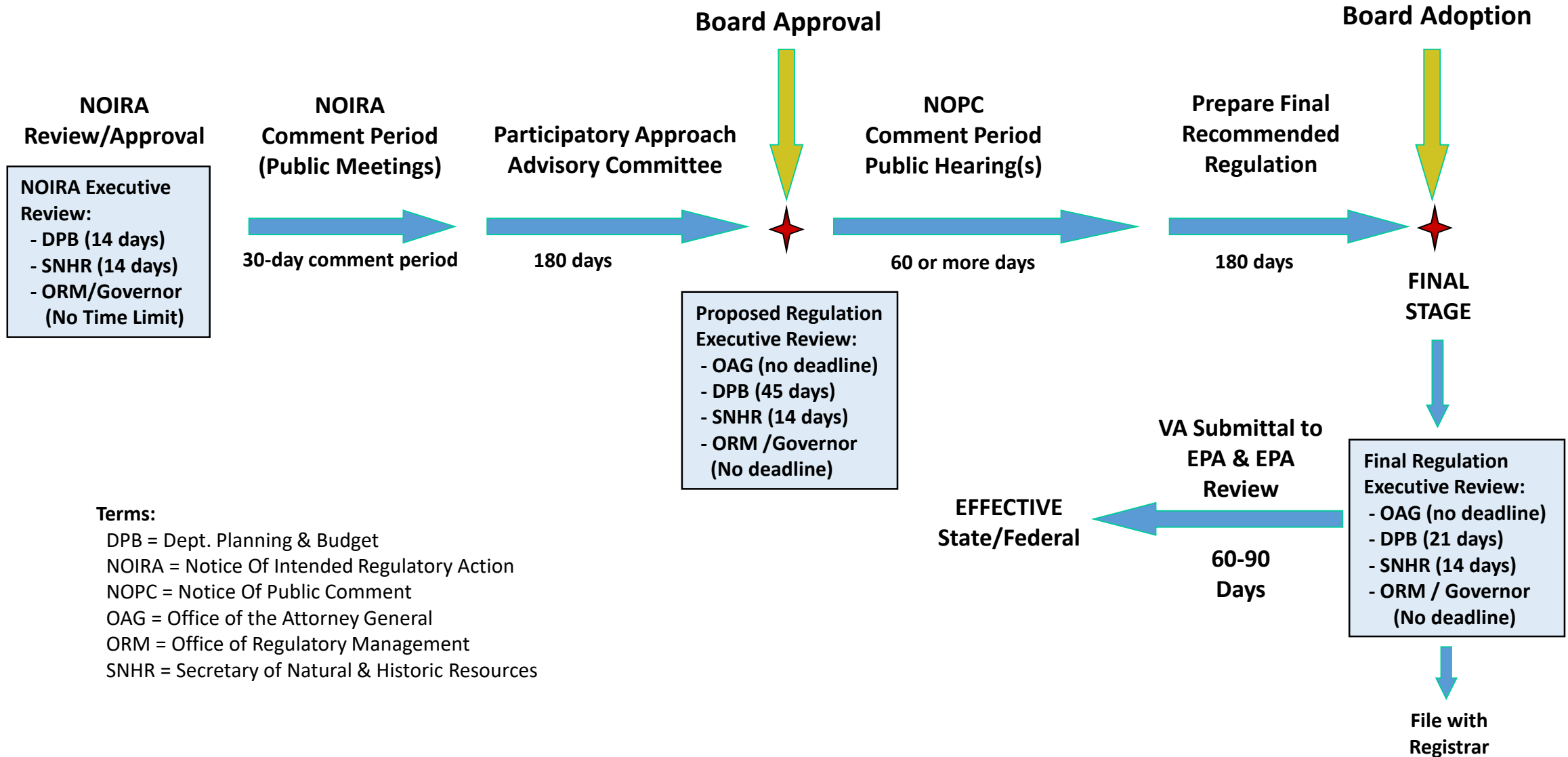
RAP Guidelines for Discussions

- Listen with an open mind - it allows deeper understanding and, therefore, progress. Goal is consensus.
- Be concise and try to speak only once on a particular issue, unless you have new or different information to share.
- Simply note your agreement with what someone else has said if you feel that it is important to do so, it is not necessary to repeat it.
- Focus on the issue, not the speaker - personalizing makes it impossible to listen effectively.
- Present options for solutions at the same time you present the problems you see.
- Stay positive; despairing of the group's inability to reach agreement will almost certainly make it so.

FOIA

1. The group is a public body subject to the Freedom of Information of Act. As such, all business of the group must be conducted in a public forum that has been duly noticed in accordance with the Act and minutes must be prepared.
2. Emails may be considered the conduct of business, so individual members of the RAP should not use "reply to all" when receiving emails from DEQ, and any member of the RAP that wants to provide information to the RAP should send it to the staff contact (David Whitehurst) for distribution.
3. As a public body, RAP members should not discuss matters of the group outside of the meetings. This applies to conversations of more than two members as well as emails among more than two members.

Administrative Process Act (APA) Regulatory Process Timeline

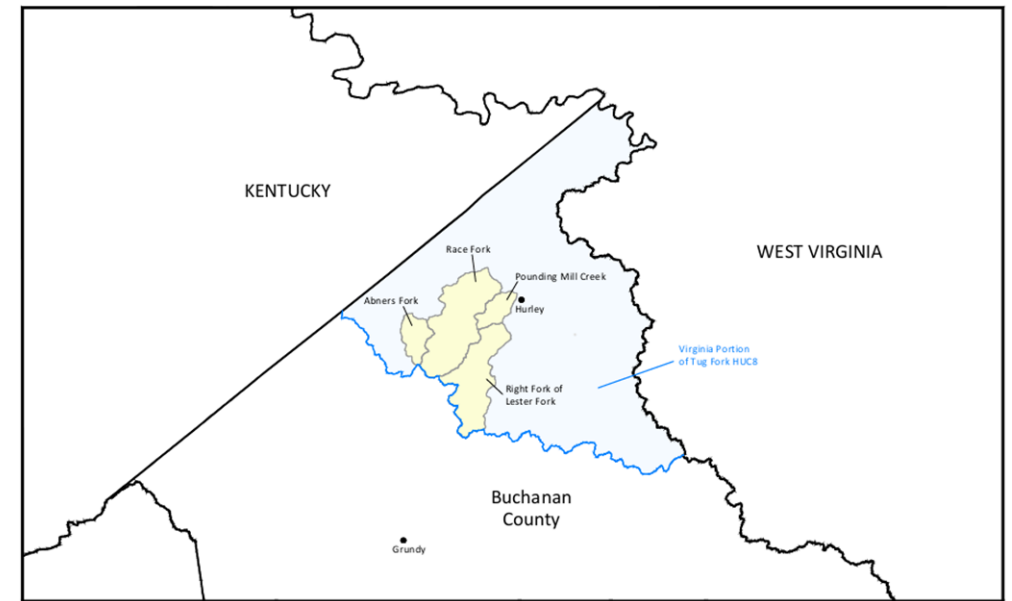


Terms:

- DPB = Dept. Planning & Budget
- NOIRA = Notice Of Intended Regulatory Action
- NOPC = Notice Of Public Comment
- OAG = Office of the Attorney General
- ORM = Office of Regulatory Management
- SNHR = Secretary of Natural & Historic Resources

Petition to Promulgate Selenium Criterion

- Request from Clintwood JOD to promulgate site-specific aquatic life criterion (SSC) for Se for several tributaries to Knox Creek in Buchanan Co.
- Streams:
 - Race Fork and tributaries
 - Pounding Mill Creek and tributaries
 - Right fork of Lester Fork and tributaries
 - Abners Fork and tributaries



Petition to Promulgate Selenium Criterion

- Petition Summary:
 - Virginia's Se criteria are over 30 years old
 - Do not reflect latest science
 - Updated methods to evaluate impacts to surface waters
- Petition had 2 requests:
 - Amend WQS to include SSC that incorporate EPA's most recently recommended (2016) freshwater Se criteria
 - Follow implementation guidance used by West Virginia
- Rulemaking will address amending the WQS regulation
- Implementation procedures developed by water quality programs implementing the criteria

State Water Control Board directive:

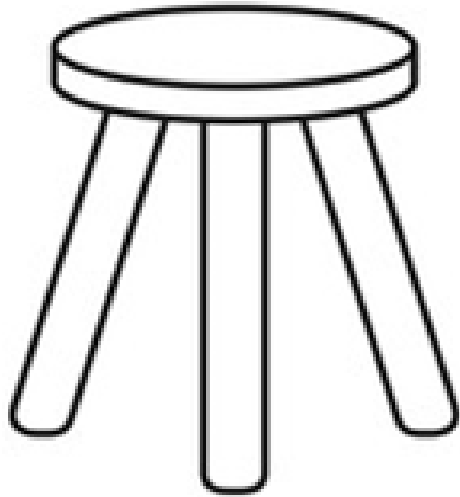
- Proceed with rulemaking to incorporate site specific selenium criteria as a special standard in Virginia's Water Quality Standards regulation (9VAC25-260) consistent with the petition request for the Knox Creek drainage in Buchanan County.

EPA's Nationally Recommended Freshwater Selenium Criterion

- EPA's update to its recommended aquatic life selenium criterion was finalized in 2016.
- This criterion is developed for the protection of aquatic life.
- It is the first (and only) nationally recommended aquatic life criterion to be expressed as both fish tissue and water column concentrations.

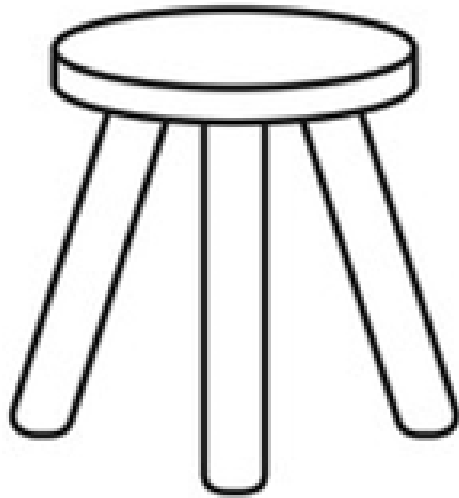
The Basics of Aquatic Life Criteria

Protective Aquatic Life Criterion



The Basics of Aquatic Life Criteria

Protective Aquatic Life Criterion



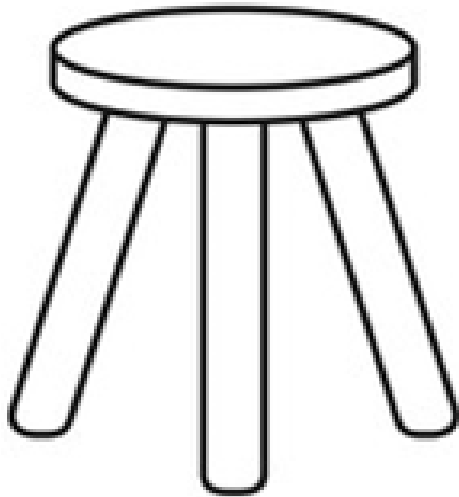
Magnitude

Magnitude = How much of a pollutant is allowed?



The Basics of Aquatic Life Criteria

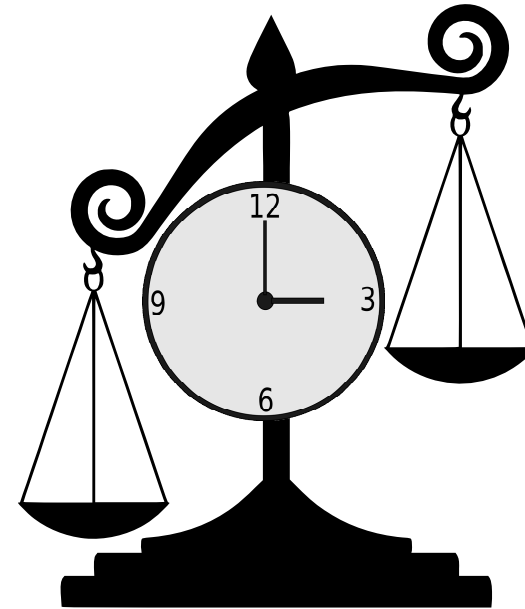
Protective Aquatic Life Criterion



Magnitude

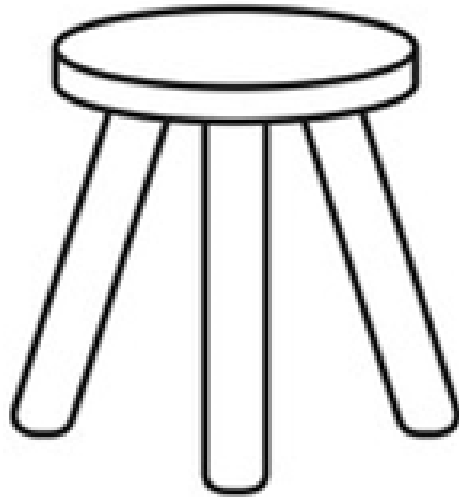
Duration

Magnitude + Duration = How much of a pollutant is allowed over a specific period of time?



The Basics of Aquatic Life Criteria

Protective Aquatic Life Criterion

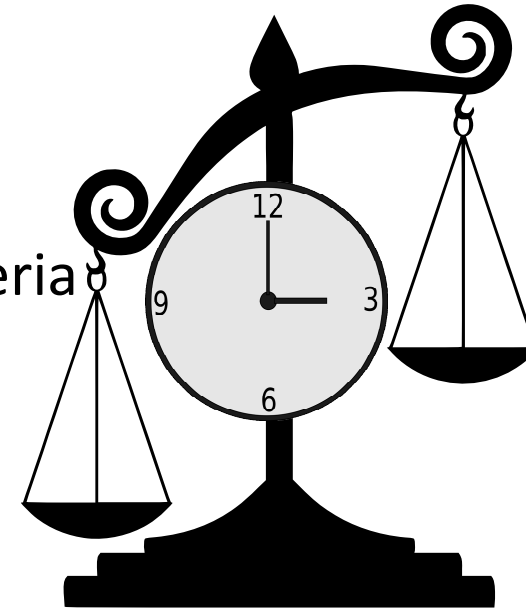


Magnitude

Duration

Magnitude + Duration = How much of a pollutant is allowed over a specific period of time?

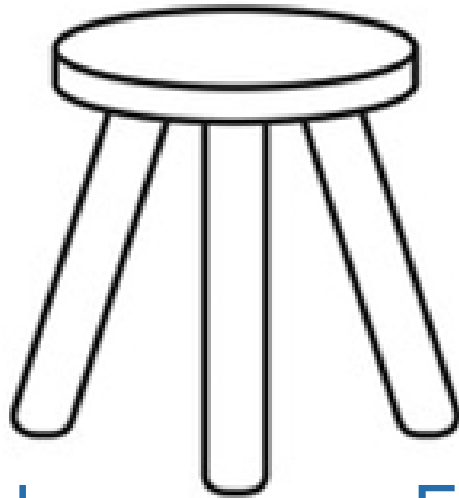
Acute toxics criteria typically have a 1-hr duration



Chronic toxics criteria typically have a 4-day duration.

The Basics of Aquatic Life Criteria

Protective Aquatic Life Criterion

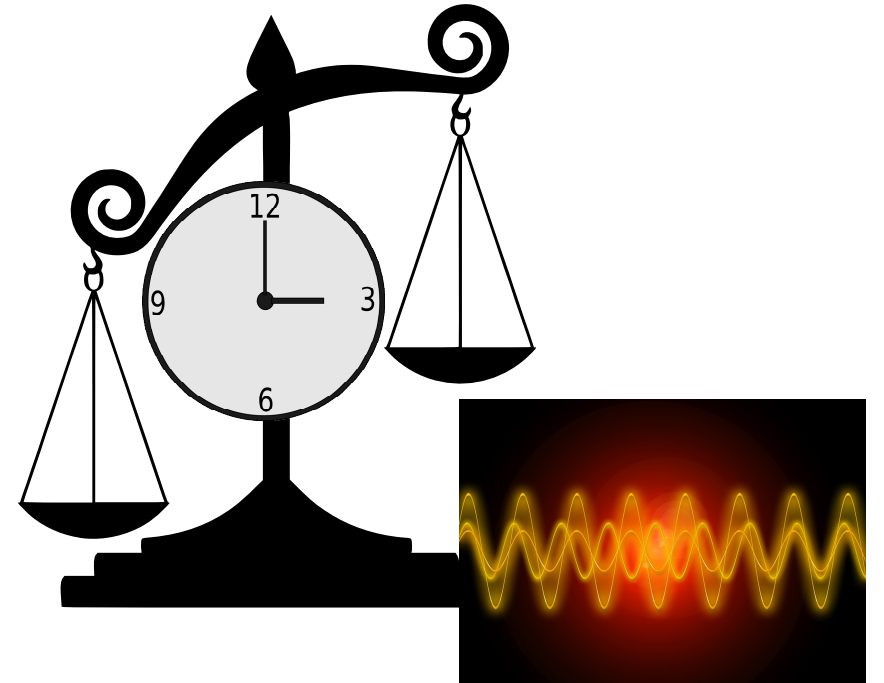


Magnitude

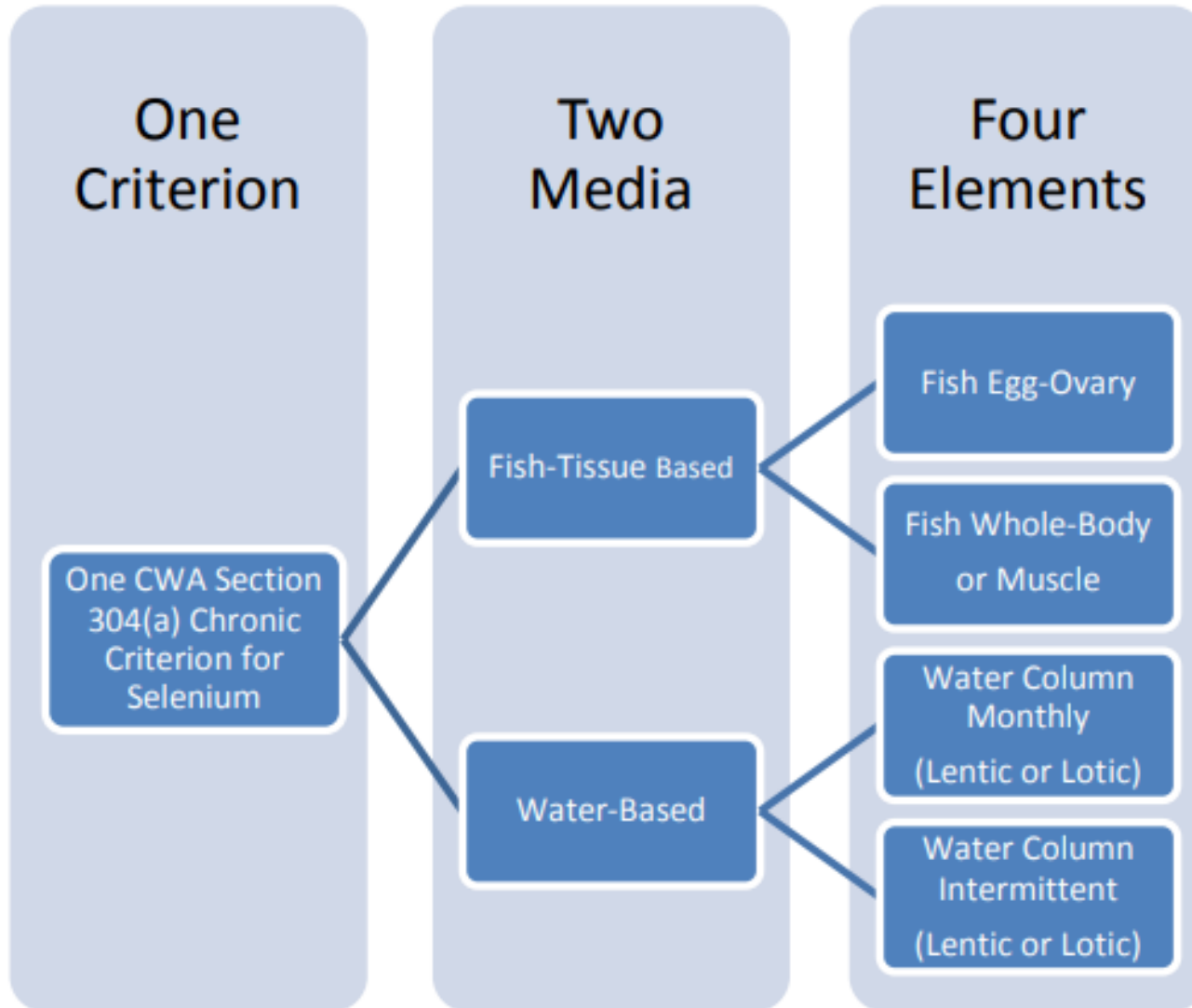
Duration

Frequency

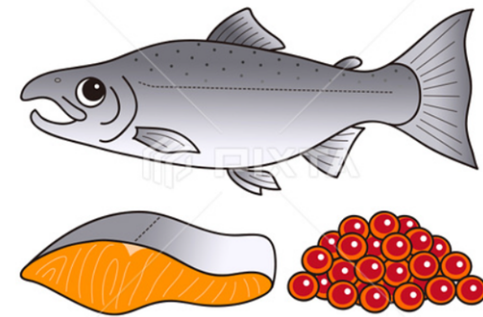
Frequency = Over what interval of time is the waterbody allowed to exceed the magnitude averaged over the duration?



EPA 2016 Selenium Aquatic Life Criteria



- First aquatic life criterion utilizing fish tissue
- Criteria elements are hierarchical
- Tissue-based values take primacy (if sufficient data available)



&



EPA 2016 Selenium Aquatic Life Criteria vs VA's Current Selenium Criteria

	Chronic					Short-term
Criterion Version	Egg-Ovary [mg/kg dw]	Whole Body [mg/kg dw]	Muscles [mg/kg dw]	Water Lentic [ug/L]	Water Lotic [ug/L]	Water [ug/L]
2016 Selenium Criterion	15.1	8.5	11.3	1.5 (30 day avg)	3.1 (30 day avg)	Intermittent exposure equation (durations shorter than 30 days)
<u>Current VA Selenium Criterion</u>	N/A	N/A	N/A	5 (4-day avg)	5 (4-day avg)	20 (1-hr avg)

EPA 2016 Selenium Aquatic Life Criteria

	Chronic					Short-term
Criterion Version	Egg-Ovary [mg/kg dw]	Whole Body [mg/kg dw]	Muscles [mg/kg dw]	Water Lentic [ug/L]	Water Lotic [ug/L]	Water [ug/L]
2016 Selenium Criterion Magnitude and Duration	15.1	8.5	11.3	1.5 (30 day avg)	3.1 (30 day avg)	Intermittent exposure equation (durations shorter than 30 days)
2016 Selenium Criterion Frequency	Not to be exceeded	Not to be exceeded	Not to be exceeded	Not more than once in three years on average	Not more than once in three years on average	Not more than once in three years on average

EPA 2016 Selenium Aquatic Life Criteria

	Chronic					Short-term
Criterion Version	Egg-Ovary [mg/kg dw]	Whole Body [mg/kg dw]	Muscles [mg/kg dw]	Water Lentic [ug/L]	Water Lotic [ug/L]	Water [ug/L]
2016 Selenium Criterion Magnitude and Duration	15.1	8.5	11.3	1.5 (30 day avg)	3.1 (30 day avg)	Intermittent exposure equation
2016 Selenium Criterion Frequency	Not to be exceeded	Not to be exceeded	Not to be exceeded	Not more than once in three years on average	Not more than once in three years on average	Not more than once in three years on average

“When fish egg/ovary concentrations are measured, the values supersede any whole-body, muscle, or water column elements except in certain situations. Whole body or muscle measurements supersede any water column element when both fish tissue and water concentrations are measured, except in certain situations. Water column values are derived from the egg & ovary concentrations via bioaccumulation modeling. Water column values are the applicable criterion element in the absence of fish tissue measurements, such as waters where fish have been extirpated or where physical habitat and/or flow regime cannot sustain fish populations, or in waters with new discharges of selenium where steady state has not been achieved between water and fish tissue at the site.” – EPA Aquatic Life Ambient Water Quality Criterion for Selenium in Freshwater 2016 Fact Sheet

Proposed Language

9VAC25-260-310. Special standards and requirements.

The special standards are shown in small letters to correspond to lettering in the basin tables. The special standards are as follows:

.....
 jj. The selenium chronic criteria for the protection of freshwater aquatic life apply in the following waters of the Knox Creek watershed in Buchanan County:

Race Fork and tributaries.

Pounding Mill Creek and tributaries.

Right Fork of Lester Fork and tributaries.

Abners Fork and tributaries.

<u>Media Type</u>	<u>Fish Tissue¹</u>		<u>Water Column⁴</u>	
<u>Criterion Element</u>	<u>Egg-ovary²</u>	<u>Fish Whole-body or Muscle³</u>	<u>Monthly Average Exposure</u>	<u>Intermittent Exposure^s</u>
<u>Magnitude</u>	15.1 mg/kg dw	8.5 mg/kg dw whole-body or 11.3 mg/kg dw muscle (skinless, boneless filet)	1.5 µg/L in lentic aquatic systems 3.1 µg/L in lotic aquatic systems	$WQC_{int} = \frac{WQC_{30-day} - C_{bkamd}(1 - f_{int})}{f_{int}}$
<u>Duration</u>	Instantaneous measurement ⁶	Instantaneous measurement ⁶	30 days	Number of <u>days/month</u> with an elevated concentration
<u>Frequency</u>	Not to be exceeded	Not to be exceeded	Not more than once in three years on average	Not more than once in three years on average
mg/kg dw = milligrams per kilogram dry weight				

9VAC25-260-310. cont'd (footnotes)

1. Fish tissue elements are expressed as steady-state.
2. Egg-ovary supersedes any whole-body, muscle, or water column element when fish egg-ovary concentrations are measured.
3. Fish whole-body or muscle tissue supersedes water column element when both fish tissue and water concentrations are measured.
4. Water column values are based on dissolved total selenium in water (measured in a water sample after it has been passed through a 0.45 µm membrane filter) and are derived from fish tissue values via bioaccumulation modeling. Water column values are the applicable criterion element in the absence of steady-state condition fish tissue data. In fishless waters, selenium concentrations in fish from the nearest downstream waters may be used to assess compliance using methods provided in *Aquatic Life Ambient Water Quality Criterion for Selenium – Freshwater*, EPA-822-R-16-006, Appendix K: Translation of a Selenium Fish Tissue Criterion Element to a Site-Specific Water Column Value (June 2016).
5. Where WQC30-day is the water column monthly element for either lentic (still) or lotic (flowing) waters; C_{bkgnd} is the average background selenium concentration; and f_{int} is the fraction of any 30-day period during which elevated selenium concentrations occur, with f_{int} assigned a value ≥ 0.033 (corresponding to 1 day).
6. Fish tissue data provide instantaneous point measurements that reflect integrative accumulation of selenium over time and space in fish population(s) at a given site.

**Special Standard notation in 9VAC25-260-490.
Tennessee and Big Sandy River Basins (Big Sandy River Subbasin).**

SEC.	CLASS	SP. STDS.	SECTION DESCRIPTION
1	IV		All tributaries of Tug Fork in Virginia.
2	IV		All tributaries of Jacobs Fork and Dry Fork in Virginia.
2a	IV	PWS	Crockett Cove, a tributary to Jacobs Fork, from Bishop's raw water intake to its headwaters.
3	IV	ii	Levisa Fork and its tributaries and Knox Creek and its tributaries, unless otherwise designated in this chapter, from the Virginia-Kentucky state line upstream to their headwaters.

Questions?