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OFFICE OF
WATER AND WATERSHEDS

October 6, 2017

Stephanie Jenkins
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, Idaho 83706

RE: EPA's Comments on Idaho's Proposed Rule for Aquatic Life Criterion for Selenium, and Revised Proposed Site-Specific Criteria, Docket No. 58-0102-1701.

Dear Stephanie:

The EPA appreciates the opportunity to provide comments to the Idaho Department of Environmental Quality (DEQ) on the proposed rule for updating Idaho's selenium aquatic life criterion. The EPA continues to support DEQ's work in updating and revising criteria for which the EPA has published new and/or revised Clean Water Act Section 304(a) recommended criteria.

The EPA has reviewed the proposed rule and associated materials and provides detailed comments and recommendations in the enclosure to this letter. The EPA finds the language for portions of the rule consistent with EPA's Aquatic Life Ambient Water Quality Criterion for Selenium – Freshwater 2016.[1] The EPA is pleased to see that, consistent with the EPA's 2016 national recommended selenium criterion, DEQ's proposed rule for statewide criteria includes all four elements of the criterion, and expresses the four elements in a manner that explicitly affirms that the whole-body or muscle elements supersede the water column element, and the egg-ovary element supersedes any other element.

Consistent with EPA's methodology for developing criteria protective of aquatic life, criteria consist of magnitude, duration and frequency components which are to be based on sound science. The EPA continues to recommend DEQ include a frequency of "not to be exceeded" for the fish tissue criteria elements (both egg/ovary and whole body) consistent with the EPA's 2016 national recommended selenium criterion. DEQ's proposed frequency of exceedance of once in three years for the tissue element of the criterion is inconsistent with EPA's current recommendations regarding fish tissue-based criteria for selenium. DEQ's lack of a justification for the proposed frequency of exceedance is a significant concern to the EPA. Given DEQ has not provided sufficient rationale for the proposed frequency for the proposed tissue criteria, the EPA may not have a basis for approving Idaho's statewide selenium tissue criteria or the site-

[1] USEPA (U.S. Environmental Protection Agency). 2016. *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016.* EPA 822-R-16-006. U.S. Environmental Protection Agency, Office of Water, Washington, DC. https://www.epa.gov/wqc/aquatic-life-criterion-selenium-documents

specific selenium tissue criteria as proposed. The EPA provides detailed review and comments regarding this issue in the enclosure to this letter.

As with any criterion, the "non-sturgeon criteria" must protect the most sensitive designated use and must be based on sound scientific rationale. With respect to DEQ's proposed non-sturgeon criteria based on the recalculation procedure deleting sturgeon from the dataset, the EPA has concerns with the proposed geographic scope of that criteria. DEQ has not adequately demonstrated that white sturgeon is not a resident species in areas of the Snake River above Shoshone Falls where sturgeon are found. The EPA suggests that DEQ further evaluate the available information and revisit the geographic boundaries of the sites where DEQ has proposed to apply "non-sturgeon criteria". The EPA provides our detailed comments in the enclosure to this letter.

The EPA reviewed the draft proposals by J.R. Simplot Company (Simplot) (August 2017) and Nu-West Industries, Inc. (Nu-West) (July 2017) for site-specific selenium criteria and has a number of concerns with those proposals. The EPA's primary concerns regarding Simplot's approach are the species sensitivity distribution and the method used to derive the whole body criterion element. With respect to the Nu-West proposal, the EPA's main concern relates to how the recalculation procedure was performed. The EPA provides our detailed comments and recommendations in the enclosure to this letter.

In EPA's 2016 selenium criterion, selenium water quality criterion elements based on fish tissue (egg-ovary, whole body, and/or muscle) data override the criterion elements based on water column selenium data due to the fact that fish tissue concentrations provide the most robust and direct information on potential selenium exposure and effects in fish. However, because selenium concentrations in fish tissue are a result of selenium bioaccumulation via dietary exposure, there are two specific circumstances where the fish tissue concentrations do not fully represent potential effects on fish and the aquatic ecosystem: 1) in "fishless" waters, and 2) in areas with new selenium inputs where steady state has not been achieved. Because of the *inability* to collect sufficient fish tissue to measure selenium concentrations in such waters, water column concentrations best represent selenium levels required to protect aquatic communities and downstream waters in such areas. As stated in the EPA's previous comment letters to DEQ, the EPA recommends DEQ include additional detail regarding these situations as it will provide the public with a better understanding of DEQ's approach to the application of the water column criterion in these situations. The EPA recommends DEQ develop additional guidance which provides a full discussion and establishes a detailed procedure for the application of selenium criteria in fishless waters and in areas with new selenium inputs. Such guidance should include a discussion of what is meant by "new selenium inputs" and activities that are likely included so that these situations are better understood by the public as well as the regulated community.

In implementing the water quality criterion for selenium under the National Pollutant Discharge Elimination System (NPDES) permits program, the EPA recommends DEQ establish additional procedures due to the unique components of the selenium criterion. If the state decides to use the selenium water column concentration criterion element only (as opposed to using both the water column and fish tissue elements) for conducting reasonable potential (RP) determinations and establishing water quality-based effluent limitations (WQBELS) per 40 CFR 122.44(d), existing

implementation procedures used for other acute and chronic aquatic life protection criteria may be appropriate. However, if the state also decides to use the selenium fish tissue criterion element values for NPDES permitting purposes, additional state WQS implementation procedures will be needed for determination of RP and development of appropriate WQBELs. The EPA recommends the use of the water column element in developing WQBELs.

States and authorized tribes have flexibility in how they interpret a discrete fish sample to represent a population. Generally, fish collected to calculate average tissue concentrations for a site are collected in one sampling event, or over a short time interval due to logistical constraints and costs for obtaining samples. The EPA provides information on sampling of fish populations in the *Draft Technical Support for Fish Tissue Monitoring for Implementation of EPA's 2016 Selenium Criterion*.[2] Furthermore, the EPA provides information on how to use the four-part criterion for the purposes of NPDES permitting and waterbody assessment, listing, and total maximum daily load (TMDL) development in the following documents: *Draft Frequently Asked Questions (FAQs): Implementing WQS that Include Elements Similar or Identical to EPA's 2016 Selenium Criterion in Clean Water Act Section 402 NPDES Programs* and *Draft Frequently Asked Questions (FAQs): Implementing the 2016 Selenium Criterion in Clean Water Act Sections 303(d) and 305(b) Assessment, Listing, and Total Maximum Daily Load (TMDL) Programs*, respectively.[3] [4] The EPA continues to recommend DEQ provide additional detail and specific procedures for application of the selenium criterion in Clean Water Act programs and that this be included in implementation guidance as this would be helpful for the public, the regulated community and DEQ staff.

The EPA appreciates DEQ's thoughtful consideration of these issues as you move forward in adopting a revised aquatic life criterion for selenium that is protective of aquatic life in Idaho's waters. The EPA continues to be available to provide assistance to DEQ on further development of the rule language and implementation procedures. If you have any questions or would like to discuss these comments further, please contact me at (206) 553-1834 or Mark Jankowski at (206) 553-1476.

Sincerely,

Lisa Macchio
Water Quality Standards Coordinator

Enclosure

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[2] USEPA (U.S. Environmental Protection Agency). 2016. *Technical Support for Fish Tissue Monitoring for Implementation of EPA's 2016 Selenium Criterion*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

[3] USEPA (U.S. Environmental Protection Agency). 2016. *Frequently Asked Questions (FAQs): Implementing WQS that Include Elements Similar or Identical to EPA's 2016 Selenium Criterion in Clean Water Act Section 402 NPDES Programs*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

[4] USEPA (U.S. Environmental Protection Agency). 2016. *Frequently Asked Questions (FAQs): Implementing the 2016 Selenium Criterion in Clean Water Act Sections 303(d) and 305(b) Assessment, Listing, and Total Maximum Daily Load (TMDL) Programs*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Enclosure

Comments on Idaho DEQ's Proposed Rule
Selenium Aquatic Life Criteria and Site-Specific Recalculation-Based Approaches for Deriving Selenium Criteria for Certain Waters in Idaho
Docket 58-0102-1701

The EPA has reviewed Idaho's revised proposed rule language, DEQ's justification document entitled "Justification for Site-Specific Selenium Criterion for Aquatic Life in Portions of Idaho" and the negotiated rulemaking summary document and provides the following comments and concerns for DEQ's consideration.

Overarching Comment: Frequency of Exceedance for the Magnitude Component of the Tissue Criteria

EPA finds no discussion or justification for DEQ's selection of the frequency component of once in three years for the fish tissue criteria elements. Frequency is the number of times an excursion of the criterion can occur over time without impairing the aquatic community or other uses. EPA's current recommendation for aquatic life criteria (1985 Guidelines)[5] of a once in three years on average exceedance frequency is based on the ability of an aquatic ecosystem to recover from a toxic insult when pollutant impacts are associated exclusively with a water column exposure. The selenium criterion differs from these typical toxic parameters because it incorporates fish tissue components into the criterion, along with a water column component. The EPA recommends that the frequency component of the fish tissue elements of the magnitude component for the selenium criterion differ from the typical "once-in-three years on average" frequency, and instead have a frequency of "not to exceed". Selenium is a bioaccumulative pollutant; therefore, elevated levels in various ecological compartments (e.g., biota, surficial sediments) require a long time period to decrease, and the associated aquatic community requires time to recover following reduction or removal of an elevated selenium exposure in a given system, if such reduction or removal is achievable. The "once in three years" frequency is recommended for toxics where the pathway of effect is through exposure to the water column. The typical criteria return frequency is not appropriate for selenium in fish tissue as this could lead to sustained ecological impacts. Past studies have shown that it can take fish tissue in excess of 10 years to return to an acceptable level after fish tissue concentrations have reached concentrations associated with reproductive impacts (Chapman et al. 2010, Finley and Garrett 2007). As selenium concentrations in fish tissues are the result of accumulation through the food web over time, a, a frequency of "not to exceed" is more appropriate for this criterion element. Frequencies of once-in-three years are associated with water column concentrations, not accumulated fish tissue body burdens of reproductive toxicants. For additional information

[5] USEPA (U.S. Environmental Protection Agency). 1985. Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses. EPA PB85-227049. U.S. Environmental Protection Agency, Office of Research and Development, Duluth, Minnesota.

regarding duration and frequency, see sections 2.7.6 and 2.7.7 of the EPA's Aquatic Life Ambient Water Quality Criterion for Selenium – Freshwater 2016.[6] The EPA recommends DEQ include a frequency of "not to be exceeded" for the magnitude component of fish tissue criteria consistent with the EPA's 2016 national recommended selenium criterion.

Idaho has expressed concerns that the frequency of "not to be exceeded" implies that one fish with a fish tissue selenium concentration higher than the criterion means that a water is impaired and that once a water is impaired and placed on the 303(d) list that the water body can never be delisted. EPA does not interpret this frequency to mean that either of these circumstances should occur.

EPA has developed draft technical support materials regarding how to sample for fish tissue, and recommends that a single fish having selenium concentrations above the criterion not be considered an exceedance of the criterion.[7] EPA has clarified that the selenium criterion is focused on the protection of populations, not individuals.

Non-Sturgeon Waters Criteria

Geographic Scope - The EPA has concerns regarding the inclusion of parts of the Snake River in the definition of the site for its non-sturgeon waters criteria. As provided in the justification document, DEQ states that sturgeon are not a resident species for purposes of the recalculation approach in areas of the Snake River above Shoshone Falls. The EPA does not agree with DEQ's position that sturgeon is not considered a resident species in the American Falls, Lake Walcott area of the Snake River.

The Recalculation Procedure in part states that the equivalent terms "resident" or "occur at the site" includes life stages and species that:

a. are usually present at the site,
b. are present at the site only seasonally due to migration,
c. are present at the site intermittently because they periodically return to or extend their ranges into the site,
d. were present at the site in the past, are not currently present at the site due to degraded conditions, but are expected to return to the site when conditions improve, or
e. are present in nearby bodies of water, are not currently present at the site due to degraded conditions, but are expected to be present at the site when conditions improve.

DEQ cites the Idaho Department of Fish and Game (IDFG) Management Plan for the Conservation of Snake River White Sturgeon in Idaho[8] as a basis in support of DEQ's decision

[6] USEPA (U.S. Environmental Protection Agency). 2016. *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016.* EPA 822-R-16-006. U.S. Environmental Protection Agency, Office of Water, Washington, DC. (pages 27-29) https://www.epa.gov/wqc/aquatic-life-criterion-selenium-documents

[7] USEPA (U.S. Environmental Protection Agency). 2016. *Technical Support for Fish Tissue Monitoring for Implementation of EPA's 2016 Selenium Criterion.* U.S. Environmental Protection Agency, Office of Water, Washington, DC.

[8] Idaho Department of Fish and Game. 2008. *Management Plan for the Conservation of Snake River White Sturgeon in Idaho.* September 2008.

to apply non-sturgeon criteria to portions of the Snake River (American Falls and Lake Walcott) where IDFG has a long-term sturgeon sport fishery management program. The rationale DEQ provides for determining sturgeon is not a resident species in these specific waters is twofold – 1) the locations where IDFG stocks sturgeon for purposes of a sport fishery is beyond the species' historical range, and 2) these fish are not expected to reproduce, nor do the locations provide habitat elements to maintain a self-propagating population of sturgeon.

However, as stated in the IDFG Management Plan "*the survival and growth of stocked sturgeon in the American Falls Dam to Lake Walcott area of the Snake River has been good and is a very popular catch-and-release fishery. As the fish proved to be doing well and angling interest has increased, stocking has increased to a more regular basis*". In addition, IDFG's management objectives for this area of the Snake River are to develop a long-term stocking plan and maintain or increase fishing opportunity for sturgeon. According to IDFG staff, they lack any specific data and/or information to know with any certainty whether or not these fish are reproducing (Jon Linders, IDFG, personal communication). Furthermore, of the nine reaches of the Snake River which include the historical extent of sturgeon, only two support viable populations characterized by self-sustaining natural recruitment (Bliss Dame to C.J. Strike Reservoir and Hells Canyon Dam to Lower Granite Reservoir). Reaches other than these two show little to no detectable reproduction.[9]

Idaho's cold water aquatic life designated use at Section 101.01.a. of Idaho's regulations is broadly defined as "*water quality appropriate for the protection and maintenance of a viable aquatic life community for cold water species*". Nowhere do the regulations characterize "viable" to include naturally self-sustaining and self-reproducing. Additionally, given the numerous waters in Idaho where IDFG has an active role in the management and stocking of both native and non-native fish, DEQ's broad cold water aquatic life use has provided and continues to provide protection to stocked fish as part of the "viable aquatic community" of species. DEQ may want to consider subcategorization of the aquatic life uses to provide additional specificity regarding stocked fisheries, if DEQ believes it is necessary to make such a distinction for the purposes of determining applicable criteria.

Given the above information, the EPA recommends DEQ consider sturgeon a resident species in areas of the Snake River above Shoshone Falls, specifically from American Falls Dam to Lake Walcott. The proposed criteria based on the recalculation approach deleting sturgeon would not be protective of Idaho's cold water aquatic life use and the aquatic community in these waters. Furthermore, consistent with the water quality standards regulation at 40 CFR 131.10(b), DEQ would need to provide additional justification and a demonstration that the criteria applied to non- sturgeon waters above Shoshone Falls would provide for the attainment and maintenance of the downstream water quality standards where DEQ has proposed criteria that are protective of sturgeon. The EPA recommends DEQ reconsider the proposed geographic scope of the non-sturgeon criteria and apply the statewide selenium criteria (which, as proposed, are protective of sturgeon) in those areas of the Snake River above Shoshone Falls where IDFG has a long term and active stocking program for sturgeon.

[9] IBID pg. 8

Bioaccumulation Factor (BAF) - DEQ has derived a BAF to be used for the calculation of a water column criterion element to be applied to non-sturgeon waters. DEQ derived this BAF using the numerical relationship (a proportion) between the EPA's 304(a) recommended whole body and water column criterion elements. With this BAF (2.75 (lotic) and 5.69 (lentic) L/g) and the proposed non-sturgeon whole body criterion element of 9.5 mg/kg dry weight, DEQ proposed new water column elements of3.4 and 1.7 µg/L for lotic and lentic waters, respectively. DEQ stated that because the BAF was "conservative," the resulting water column criteria were conservative. DEQ's calculated BAF is based upon the national water column criterion element, a 20th percentile of national water column values protective of the fish tissue element. EPA previously commented that DEQ may consider using its own data for this analysis and/or further explain how the national BAF represents bioaccumulation processes in Idaho waters by detailing how water body types compare for each region. DEQ has not provided sufficient information in its justification document that addresses this concern. Although Figure 4 and associated text in the justification document indicates that selenium concentrations in water and fish muscle collected statewide in 2008 were generally below the proposed non-sturgeon criteria, this information does not allow EPA to determine whether the BAF is representative of Idaho waters. EPA recommends adding a line to this graph, which represents the BAF for lotic systems that Idaho is proposing to use to modify the water column criterion element. Adding this line will help represent how the BAFs of these data points compare to the proposed value. In addition, it would be useful to include an appendix that calculates the BAFs of each of these points and the resulting criterion that would be appropriate for that BAF so that the data can be easily compared to the proposed criterion. Finally, it would be useful for Idaho to also present data from lentic systems, if available, so that EPA can evaluate how protective the proposed criterion is of Idaho's lentic waters.

Rule Language – Section 58.01.02.210.01 Statewide Selenium Criterion

Sampling of Fish Tissue

Footnote #2 includes a statement regarding sampling of fish tissue. It specifies that composite sampling shall consist of at least five individuals of the same species and similar size. Although this limited statement regarding composite sampling might appear helpful, additional and more detailed information regarding sampling is needed. The EPA recommends DEQ not include information related to sampling in the footnotes to the criteria values because the proposed language does not adequately cover or address multiple considerations for conducting sampling of fish tissue. The EPA recommends DEQ address sampling and monitoring recommendations more comprehensively and separate from the regulatory language for the criteria, as Idaho does with respect to its methyl mercury fish tissue criterion. For example, it would be helpful to provide information on circumstances when analysis of individual fish samples might be useful and sufficient. The EPA's draft technical support document provides a detailed discussion of a number of considerations such as temporal and spatial concerns, sample type (composite and individual) and target species.[10]

[10] USEPA (U.S. Environmental Protection Agency). 2016. *Technical Support for Fish Tissue Monitoring for Implementation of EPA's 2016 Selenium Criterion.* U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Current EPA guidance on fish tissue monitoring recommends using composite samples and recommends using 3 to 10 individuals for a composite sample for each target species as availability allows (USEPA 2000a). In Section 6.1.2.7.1 of the Fish Advisory Guidance ("Guidelines for Determining Sample Sizes"), the guidance maintains that it is not possible to recommend a single set of sample size requirements for all fish contaminant monitoring studies (USEPA 2000a). At each site, states and authorized tribes should determine the appropriate number of individuals per composite sample and number of replicate composite samples. This should be based on site-specific estimations of the population variance of the target analyte concentration, fisheries management considerations, and statistical power consideration. For example, fewer replicate composite samples and/or fewer individuals per composite sample may be required if the population variance of the selenium concentration at a site is small and vice versa for populations exhibiting high variance in their selenium concentrations. In the former case, it would not be cost-effective to use sample sizes that are larger than required to achieve the desired statistical power. Additionally, fish tissue monitoring for criteria implementation may be conducted on much smaller streams than those sampled for fish consumption purposes, and there may be limited numbers of fish available in these smaller tributaries. In EPA's National Lake Fish Tissue Study, composites were generally required to include five fish. This composite size represented a reasonable number of fish that also satisfied statistical requirements. Based on this precedent and EPA's Fish Advisory Guidance, EPA recommends that in most waters composites of five fish be used for fish tissue monitoring for selenium criteria implementation. However, EPA recognizes that sometimes it might not be possible to collect a five-fish composite or, as described above, five fish might not be necessary to have sufficient statistical power. In these cases, EPA encourages the use of as many fish as possible (or necessary) in the composite. Given that these site-specific exceptions can occur where five fish could not be sampled, EPA recommends removing the sampling language from rule and including it in a separate implementation document that can address these specific circumstances. Organisms used in a composite sample should meet the following recommendations:

- all the same species.
- of similar size so that the smallest individual in a composite is no less than 75% of the total length (size) of the largest individual (the "75% rule"; does not apply to egg-ovary samples).
- collected at the same time (i.e., collected as close to the same time as possible but no more than 1 week apart).
- collected in sufficient numbers to provide at least 20 grams composite homogenate sample of tissue for analysis of selenium.

EPA's Fish Advisory Guidance provides recommendations on the number of composite samples to collect. It recommends collecting at least two composite samples at each site, and encourages a third, in order to properly estimate the site variance. For the purposes of sampling fish in potential selenium impacted waters, the number of composite replicates may be determined on a case-by-case basis. This decision would primarily be based on the presence of target species and the numbers of individuals present at the site in question. Individual organisms used in composite samples must be of the same species, in part because of the differences in selenium bioaccumulation potential between species. EPA recognizes that, in contrast to other bioaccumulative contaminants in fish, selenium concentrations are generally conserved or

increase incrementally at each trophic level in a food web. This is because there is relatively little variation across all trophic levels of fish since the trophic transfer factors from prey to fish are small, with some exceptions (e.g., molluscivorous fish).

Although EPA recommends the use of composite samples for selenium fish tissue monitoring, there are some instances where collecting individual fish may be desirable. An individual sample is a discrete sample from a single fish, and can be an egg-ovary sample, a whole body, or a muscle (fillet) sample. Analysis of individual fish samples may be of interest to evaluate spatial and temporal differences among individuals of a species of similar size or across the population of a species residing in a specific water body. For water bodies or segments that are known to be impacted by selenium, individual samples may better estimate the magnitude (i.e., extreme values) of the impact and may provide information about selenium source-exposure relationships in large water bodies. Individual samples may also allow for the identification of fish that are migrant or transient in a population, since that fish may have a higher or lower concentration of selenium than other fish in the area. EPA recommends 20 grams as a minimum tissue mass required per individual fish for analysis and quality assurance/quality control (QA/QC). If using individual samples for the purposes of selenium criteria implementation, all fish should be the same species and from the same waterbody (or site for large waterbodies) within the same sampling period. Where compositing such individual samples or calculating an average concentration, the fish should be of similar size (within the 75% rule) and the samples should be of the same tissue type. When using individual fish tissue samples for selenium monitoring, EPA recommends targeting at least 5 individuals for analysis to achieve measurements of a reasonable statistical power. In the event that collecting at least 5 individuals of one species is not possible, fewer specimens may be sufficient to provide adequate biomass for both selenium analysis and QA/QC, but the statistical power of the analysis may be affected.

As previously stated, the EPA suggests more detailed information on monitoring and sampling considerations would be helpful and recommends that DEQ provide such information in separate technical support materials and/or implementation guidance. The EPA recommends that DEQ include a reference to such a document in the rule language.

Monitoring Compliance in Fishless Waters

Footnote #3 to footnote "r" contained in Section 210 of the proposed rule discusses assessing compliance in fishless waters and similar language was added to the proposed site-specific criteria. The proposed language is as follows:

3. Water column values are based on dissolved total selenium in water 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 approaches 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).

This approach is based on language from Appendix K,

> "When fish are absent from a waterbody, consideration of sampling the most sensitive fish species inhabiting nearby, most proximate downstream waters may be useful in order to understand selenium bioaccumulation potential in such systems. Although the upper reaches of some aquatic systems may not support fish communities, the invertebrate organisms that reside there may tolerate high concentrations of selenium and pose a selenium risk to predator fish if transported downstream. Users may choose to evaluate upstream waters without fish by measuring the selenium concentration in water, biotic and/or abiotic particulate material, and/or the tissues of invertebrate aquatic organisms that reside there. Because selenium associated with particulate material and invertebrate organisms can be transported downstream during intermittent high flows, elevated concentrations of selenium in the tissues of downstream fish could indicate upstream sources of selenium that require a more detailed evaluation of upstream conditions."

This suggestion from Appendix K is intended to help understand the system and the downstream effects of selenium in the context of developing a site-specific criterion. It's not intended to demonstrate whether the upstream use is protected, but rather whether the criterion set upstream in the fishless water is going to be protective of the fish communities downstream. In addition, the selenium criterion is an aquatic life criterion that is intended to protect the entire aquatic community, not just fish within the aquatic community. Given this, it is important to assess selenium within the water body where aquatic species occur, even if those aquatic species are invertebrates. By only assessing fishless waters with fish downstream, a situation that may harm invertebrates may be missed upstream, if the water column concentration is too high. The EPA does not recommend solely using fish tissue from the nearest downstream water to assess whether the criterion is met in the upstream water. Data from downstream may help inform a listing decision, but readily available data from the stream segment in question must be the primary consideration for a listing decision.[11] If the state decides to use fish data from downstream to help inform their listing decision, the EPA recommends that they define downstream in its implementation guidance. Examples of some elements that need to be defined are: What constitutes a downstream water? Does it only refer to downstream within the same water body or does it refer to the proximate downstream water body? After what distance can data no longer be considered in the assessment?

In a fishless water, consistent with the requirement in 40 CFR 130.7 to assemble and evaluate all readily available data and information, the EPA recommends that DEQ not disregard available water column data for assessment purposes.

Given that the aquatic community in a fishless water varies from waters containing fish populations, the EPA suggests developing site-specific criteria for these waters. A criterion that reflects the unique situation of this ecosystem will protect this water body more appropriately and allow for more accurate assessment of attainment of designated uses. The EPA recommends

[11] Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act July 29, 2005

the development of a site-specific criterion and assessing using that new criterion over assessing fishless waters by using downstream fish.

In addition, it is unclear what is meant by "[assessing] compliance." Is this meant to refer to making listing decisions and deciding whether the water body is attaining the criterion or meant to refer to whether a facility is in compliance with a NPDES permit? The EPA recommends that states use the water column element to develop and establish WQBELs in NPDES permit limits. Permit compliance should then be assessed against the established WQBELs.

Rule Language – Section 58.01.02.287. Site-Specific Criteria

See the EPA's detailed comments below regarding concerns with each of the site-specific fish tissue criteria proposed for the subsection of the Blackfoot Subbasin (Nu West's proposal) and the subsection of the Salt Subbasin (J.R. Simplot's proposal). The EPA recommends DEQ evaluate all concerns the EPA has identified regarding the site-specific criteria and consider revisions to the site-specific criteria regulatory language consistent with any modifications to delineation of the site(s) and/or recalculations that may be needed to address these concerns. The EPA recommends DEQ consider revising the rule to address the following: 1) the rule language should specify the frequency component of "not to be exceeded" for the site-specific fish tissue criteria, 2) the numeric values contained in the tables under Section 287.01 and 287.02 should be recalculated to address concerns the EPA discussed above with respect to the egg/ovary and whole body tissue criteria, and water column criterion for both the Blackfoot and Salt Subbasins and 3) the EPA recommends that the tables in Section 287.01 (subsection of the Blackfoot subbasin) and 287.02 (subsection of Bear Lake subbasin) include criteria values for the water column elements. As proposed, footnotes #3 and #4 at 287.01 and .02 state the following:

> *3. Water column values are derived using the empirical BAF method.* ***For comparative purposes only, the example value displayed in this table*** *represents the lotic water column value for Sheep Creek based on the average BAF for Cutthroat Trout among all sampling locations and years.*
>
> *4. Lotic Water Column Equation =*
>
> $$\frac{Tissue_{criterion}}{BAF}$$
>
> *where Tissue $_{criterion}$ is the fish tissue element (whole-body), and BAF is the bioaccumulation factor derived by dividing site-specific field-collected samples of fish tissue (whole-body) by site-specific field-collected samples of water.*

The EPA recommends DEQ revise footnotes 3 and 4 and provide values for the water column criteria element in the table for each site-specific criterion.

Adoption of Appendix K as a Performance Based Approach for Deriving Site-Specific Water Column Criteria Elements

The EPA is supportive of DEQ's adoption of Appendix K in EPA's *Aquatic Life Ambient Water Quality Criterion for Selenium – Freshwater 2016,*[12] by reference as a performance-based approach that derives site-specific water column targets to account for the most up-to-date data and information. Because comments on the site-specific water column element derived using the performance-based approach would be received in response to individual actions through each of the implementing programs this approach likely involves more coordination among the implementation programs to ensure that they are aiming to achieve the same desired condition in the water body. DEQ should consider including additional language noting that if alternate approaches other than Appendix K are used that such criteria will need to be treated individually as site-specific criteria consistent with the procedures described in DEQ rule at section 58.01.02.275. EPA discussed the performance-based approach to setting water quality standards at *EPA Review and Approval of State and Tribal Water Quality Standards*, 65 Fed. Reg. 24641, at 24648 (Apr. 27, 2000). Once again, the EPA recommends that DEQ develop additional guidance that would be helpful to entities developing site-specific water column elements using the performance-based approach.

In the *Draft Technical Support for Adopting and Implementing EPA's 2016 Selenium Criterion for Water Quality Standards,*[13] the EPA provided example language for adopting the procedures in Appendix K as a performance based approach for deriving water column criteria elements. That language is as follows:

> "Site-specific water column criteria elements will be derived using the mechanistic model and associated procedures laid out in appendix K of *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016.* **To derive scientifically defensible site-specific water column criteria elements, appropriate input parameters (as described in Appendix K) will be selected to adequately represent the water body of interest."**

The EPA recommends that DEQ include additional language in Section 287 of the proposed rule similar to the above to specify that input parameters will adequately represent the water body. In addition, the EPA recommends DEQ specify in what circumstances they would use the mechanistic or empirical BAF method.

For public transparency, DEQ should maintain a list of the resulting site-specific criteria on their publicly accessible website. DEQ has not discussed or provided details regarding how it intends to ensure the public as well as other agencies and programs that utilize the site-specific water

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[12] USEPA (U.S. Environmental Protection Agency). 2016. *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016.* EPA 822-R-16-006. U.S. Environmental Protection Agency, Office of Water, Washington, DC. (pages 27-29) https://www.epa.gov/wqc/aquatic-life-criterion-selenium-documents

[13] USEPA (U.S. Environmental Protection Agency). 2016 *Draft Technical Support for Adopting and Implementing EPA's 2016 Selenium Criterion for Water Quality Standards 2016.* EPA 820-F-16-010. U.S. Environmental Protection Agency, Office of Water, Washington, DC. (pg.7) https://www.epa.gov/wqc/aquatic-life-criterion-selenium-documents

column criteria resulting from use of the performance based approach would know the effective criteria for specific waters. EPA also encourages DEQ to coordinate closely with EPA when developing the first few studies to develop a water column element based on the performance-based approach.

Proposed Site-Specific Selenium Criterion for Hoopes Spring, Sage Creek, and Crow Creek near the Smoky Canyon Mine (August 2017)

The EPA has reviewed J.R. Simplot's August 2017 revised report and provides the following concerns and detailed comments for DEQ to consider.

Executive Summary of the J.R. Simplot revised report
(p. x) "The frequency component for this SSSC proposal is consistent with the overall IDEQ treatment of the frequency component in adoption of the 2016 National Criterion. IDAPA 58.01.02.010.15 defines the frequency of chronic criteria exceedance as follows '...Chronic criteria are expected to adequately protect the designated aquatic life use if not exceeded more than once in every three (3) years...'" As mentioned previously, EPA recommends a frequency of "not to be exceeded" for fish tissue criterion elements, consistent with the EPA's 2016 national recommended selenium criterion. The frequency component of the fish tissue elements of the selenium criterion differs from the typical "once-in-three years on average" frequency of water column criteria because selenium is a bioaccumulative and the pathway for exposure is through the food web. Even in lotic systems, selenium is an element that is persistent in the ecosystem. It is expected to be present in the sediments and retained in the system for over some period of time. This creates the potential for selenium to continue to transfer into the food web and impact upper trophic levels, such as fish. A shorter exceedance frequency period will increase the proportion of the population that experiences reproductive effects over time and increases the variability in reproductive success within the population.

There is not a lot of empirical information on which inorganic form of selenium is dominant in lotic systems. There is information in the literature on which selenium form is predominant in different sources of selenium[14]. Fish accumulate selenium primarily via their diet in which the forms of selenium have been largely transformed from inorganic selenium to primarily proteinaceous selenium and seleno-amino acids. The recovery time of the fish population will depend on how fast a system recovers from a population level effect, such as reproductive impacts of selenium.

Simplot has referenced Hardy et al. (2010)[15] to support the rationale that a frequency of 1 in 3 years is appropriate for the fish tissue criterion elements of their proposed selenium criteria. In this study, laboratory fish were switched from a high selenium diet to a control diet and the rate

[14] Chapman P.M., W.J. Adams, M.L. Brooks, C.G. Delos, S.N. Luoma, W.A. Maher, H.M. Ohlendorf, T.S. Presser, D.P. Shaw (eds). 2010. Ecological Assessment of Selenium in the Aquatic Environment. SETAC Press, Pensacola, FL, USA.

[15] Hardy, R., W. Libbie, L.Oram, and G. Moeller. 2010. Effects of Dietary Selenomethionine on Cutthroat Trout (*Oncorhynchus clarki bouvieri*) Growth and Reproductive Performance Over a Life Cycle. *Arch. Environ. Contam. Toxicol.* 58(1): 237-245.

of depuration was observed. In natural situations selenium environmental concentration reductions would likely be a gradual process assuming clean-up efforts resulted in lower selenium inputs into the system. Hardy et al. (2010) concluded that there would be a lower (*of unknown magnitude*) depuration rate in the field that would vary by fish species. Given this information, this study is not comparable to the situation that fish at this site would be experiencing. In addition, this study had a number of treatment groups that only had a sample size of 2 at the completion of the study. This low sample size adds uncertainty to the conclusions of this study. Further, a controlled laboratory body burden depuration study with one food source and no sediment matrix, as reflected in the Hardy et al (2010) study, may not reflect population level reproductive effects potentially occurring in the environment after sustained selenium exposures. EPA requests additional information justifying the appropriateness of the use of the 1-in-3 years exceedance frequency.

(p. viii, Table ES-1, Footnote 1) The EPA recommends sampling and monitoring recommendations be addressed more comprehensively and separate from the regulatory language for the criteria. As stated previously, the EPA suggests more detailed information on monitoring and sampling considerations would be helpful and that DEQ provide such information in separate technical support materials.

Section 2.3 Geographic Scope of Applicability and Section 5.2.3 North Fork Sage Creek and Pole Canyon Creek

(p. 9 and p. 23-24) The EPA has concerns regarding the application of the proposed SSC to North Fork Sage Creek and Pole Canyon Creek; areas that have not been sufficiently characterized in the SSC documentation. The report lacks the necessary detailed justification for applying the proposed SSC to these two additional water bodies as they were not included in the initial development of the study design and therefore have not been characterized. The EPA continues to recommend inclusion of data and an analysis of those data to corroborate the statement that the SSC is applicable to these streams. Although the revised Simplot report now contains additional citations to several documents, this does not address the EPA's previous comment, as no data were presented directly within the SSC document. Data from the cited CERCLA documents should be included and interpreted by Simplot in light of the SSC application, to ensure that they can be easily evaluated in the context of the proposed SSC. Additionally, an analysis of any applicable data and/or information such as water quality and biological survey results is needed in order to provide support to the stated assumption that the SSC for the downstream waters is also "appropriate" for North Fork Sage Creek and Pole Canyon Creek. Without such an analysis there remains a significant amount of uncertainty regarding whether bioaccumulation of selenium in these waters is similar or different compared to Hoopes Spring, South Fork Sage Creek and Sage Creek and ultimately whether the proposed criteria developed specifically for other waters would be protective of aquatic life in North Fork Sage and Pole Canyon Creeks.

Section 6.2 Whole Body

In order to determine a whole-body criterion element, a conversion factor (CF) calculated from the brown trout data was used to convert the egg-ovary criterion element into a whole body criterion element. The EPA has some concerns about this method of calculating a whole-body

criterion element value. Conversion factors are based on physiological processes and tend to be driven more by the species than the site. Therefore, it is more appropriate to create a new species sensitivity distribution (SSD) of whole body species mean chronic values (SMCVs). The whole body SMCVs could be calculated by converting each egg-ovary SMCV to a whole body SMCV using a species-specific CF or a whole body SMCV that was directly measured could be used. This whole-body SSD should be used to calculate the whole-body criterion element using the 4 most sensitive species as described in the 1985 Guidelines (EPA PB85-227049). For purposes of comparison, EPA calculated what the whole body criterion would be after applying EPA's 2016 CFs to the Simplot egg-ovary SSD. Simplot's current proposed whole body criterion is 13.63 mg/kg dw selenium, whereas using the method stated above, the whole-body criterion would be 9.87 mg/kg dw selenium.

The EPA recommends that species specific CFs be utilized to develop a SSD for whole body selenium in order to determine the site specific whole body criterion element. Currently, Simplot is utilizing the brown trout specific CF to convert the egg-ovary criterion element, which was derived from an SSD with multiple species, to the whole body criterion element. As CFs are specific to species, using one species specific CF to convert a criterion element intended for all species at the location is problematic. The influence of site is less important than species when considering CF values.

Simplot contends that the brown trout CF should be utilized because brown trout is the most sensitive species at the site and that the egg-ovary is the most sensitive end point for this species. While it is true that the egg-ovary is the most sensitive end point and brown trout is the most sensitive species with respect to that end point, brown trout is not the most sensitive species with respect to the whole-body endpoint. The genus *Oncorhynchus* is the most sensitive genus with respect to the whole-body endpoint, with rainbow trout being the most sensitive species. Converting from an egg-ovary number derived from the site specific SSD, which utilizes data from multiple species, to a whole-body number using only the CF from brown trout is not appropriate. The resulting criterion element derived in this manner would not be protective of rainbow trout.

Simplot also contends that the use of the brown trout CF is appropriate because brown trout will be the species sampled for monitoring. While this again may be true, a criterion should be designed to protect all species within a site, not designed to reflect what species will be monitored. The use of species specific CFs is more appropriate for developing a whole-body criterion element that is protective of the entire community.

Tables

Table 1: The presence/absence data presented in Table 1 is useful for demonstrating what species are present at these sites. Is there corresponding abundance data available? Also, what time of year were these fish surveyed and with what methods?

Table 5: The EPA has several concerns about the SSD that was used to derive the egg-ovary selenium criterion element. First, the EPA has concerns over the use of SMCVs in this SSD as opposed to using genus mean chronic values (GMCVs). When creating an SSD, EPA has recommended, in the 1985 Guidelines methodology document, using GMCVs rather than SMCVs as species within a genus tend to be more similar toxicologically than species in different genera. Using GMCVs rather than SMCVs prevents data sets from being biased by an overabundance of species in one or a few genera and artificially elevating the "N" in the regression analysis. However, if the State believes that all the species present within this site have been identified, then it may be appropriate to use SMCVs to calculate the criterion.

The EPA also has concerns about some of the species that were included in the SSD. Simplot included some species in their SSD that EPA did not include in the criterion derivation due to the inability to effectively characterize an EC_{10} value for the species based on currently available data. These species include the Yellowstone cutthroat trout and white sucker.

The EPA found that the Yellowstone cutthroat trout data were highly variable and therefore a clear effect value could not be calculated from these data. While Simplot has indicated that these data have been reevaluated with a modified data set, this new data set also still has a large amount of variability. In addition, the asymptote of the fitted curve shows that the proportion of the larvae that were normal and surviving was about 30%, which is a very low value to establish as a baseline. Also, three data points were removed in order to establish this fit. EPA requests additional statistical analysis to demonstrate that these points were in fact outliers and should be removed from the data set.

The EPA also decided not to include the white sucker data (de Rosemond et al. 2005 study[16]) in the 2016 selenium criterion derivation, as this study did not have a control and a clear effect level was not observed in this study. The lack of a control treatment in this study complicates the interpretation of this study as certain types of deformities were classified as naturally occurring and were not included in the analyses of effects. Without a control, it cannot be confirmed that the removal of the embryological deformities from the analysis was appropriate. Given these complications, definitive conclusions cannot be drawn from this study. For additional support, Simplot references the Muscatello and Janz 2009 study[17], where white sucker eggs had concentrations of selenium of 4.86 ± 0.52 mg/kg dw for exposed sites versus 1.94 ± 0.25 mg/kg dw for reference sites. In this study, only edema was higher for fry from the exposed site. As the exposure concentration in this study is much lower than the proposed egg-ovary criterion of 19.9

[16] de Rosemond S.C., Liber K., Rosaasen A. 2005. Relationship between Embryo Selenium concentrations and Early Life Stage Development in White Sucker (*Catostomus commersoni*) from a Northern Canadian Lake. *Bull. Environ. Contam. Toxicol.* 74: 1134-1142.

[17] Muscatello, J.R. and D.M. Janz. 2009. Selenium accumulation in aquatic biota downstream of a uranium mining and milling operation. *Science of the Total Environment* 407: 1318-1325.

mg/kg dw, it is unclear how this study lends support for the use of the white sucker data or the protectiveness of the proposed criterion element.

Regarding the sculpin data, EPA appreciates the additional information included in Appendix B on Lo et al. (2014)[18] and the existing sculpin population, age class, and whole body selenium data. EPA remains concerned about the inclusion of the sculpin data in Simplot's SSD. With the limited information that is available, it is difficult to give a comprehensive review. One potential issue is the control group being exposed to 0 mg/kg selenium. Since selenium is a micro nutrient, this would likely result in some decline in fish health unless selenium was supplemented or present in their diet. Additionally, based on Simplot's summary, no significant adverse effects were observed for hatching success, fry survival, or deformities and the authors of the study concluded that the NOEC for egg tissue was greater than 22.0 mg/kg selenium dw (maximum concentration observed in eggs), resulting in an unbounded NOEC. EPA believes that the NOEC should be the mean concentration of all the fish in the exposure group that were no different from the controls, and that it isn't appropriate to use one fish from the exposure group to represent the NOEC. For EPA to fully assess the Lo et al. (2014) study, more details on this study are still needed. For the reasons stated above, EPA does not agree with the inclusion of the sculpin data in Simplot's SSD and subsequent site-specific criterion.

EPA also reviewed the site-specific sculpin data provided in Appendix B of Simplot's proposal. While the field data appears to suggest that sculpin populations are performing similarly in reference vs. selenium impacted sites, EPA has a few questions/comments regarding this assessment:

1) EPA would like to know where the Deer Creek monitoring site is and why the Deer Creek data were not used on a more consistent basis across all site comparisons? Figure E2 shows it upstream of impacted sites and a tributary of Crow Creek. Deer Creek is said to be a reference site, but selenium water concentrations are higher there than any of the other sites (Figure 2, App B). This is something EPA would like to see explained in more detail.

2) EPA is concerned that comparisons between reference sites and impacted sites may not be fully representative. The reference sites are generally only from one creek which is concerning in terms of a lack of experimental replication. In other words, fish populations in one creek may be affected by factors other than selenium levels; therefore, more than one reference location (creek) is important to more reliably determine if selenium has affected fish populations. Additionally, the reference site sampling locations that are

[18] Lo, B.P. and V.L. Marlatt, Univ of Fraser Valley / Biology; J. Baker, J.R. Elphick, Nautilus Environmental; A.M. deBruyn, Golder Associates Ltd; M. Patterson, Anglo American Coal; B. Leighton, Simon Fraser Univ; C.J. Kennedy, Simon Fraser Univ / Dept of Biological Sciences; H.C. Bailey, Nautilus Environmental. SETAC North America 35th Annual Meeting, Vancouver, British Columbia, November 2014.

closer to impacted areas show higher selenium concentrations in sculpin tissue (e.g., CC-350 has higher selenium concentrations than CC-75). This suggests that some of the reference sites are in fact not truly reference sites.

Nu-West Industries Report - Proposal for Site-Specific Selenium Criteria for the Upper Blackfoot River and Georgetown Creek Watersheds (July 2017)

The EPA has reviewed Nu-West's report and provides the following concerns and detailed comments for DEQ to consider.

Section 3.1 Resident Fish in the Upper Blackfoot River Watershed

The proposed lower site boundary for the selenium SSC for the Upper Blackfoot River is at the river's mouth, where it enters the Blackfoot Reservoir. Given the selenium criteria in the reservoir (a downstream lentic waterbody) are more stringent that the proposed selenium SSC in the river it would be important to discuss how the proposed selenium SSC would be protective of the adfluvial trout in this area. Yellowstone cutthroat trout exhibit three life history strategies: 1) a fluvial life history in which fish feed and grow in larger rivers such as the Blackfoot River and then migrate to tributaries for spawning and rearing 2) an adfluvial life history in which individuals feed and grow in lakes before migrating to tributaries for spawning and rearing, and 3) a resident form in which fish live their entire life cycle in the tributary streams. It is the EPA's understanding the Blackfoot Reservoir provides lacustrine habitat for an adfluvial form of Yellowstone cutthroat trout that resides in the reservoir for most of its life before migrating upstream in the spring to spawn and rear in the upper tributaries.[19] Therefore an important concern is whether the proposed selenium SSC is protective of any resident species with an adfluvial life history and that are or could be present at the site. The EPA recommends that the protectiveness of the proposed SSC to the adfluvial species be addressed and discussed in the report.

Section 3.2 Resident Fish in Georgetown Creek Watershed

Please provide additional information about the methods that were utilized to conduct each fish survey. Descriptions of several of the surveys only refer to fish surveys being conducted (for both the Upper Blackfoot River watershed and the Georgetown Creek Watershed). Without additional information about how those surveys were conducted, EPA is unable to evaluate how comprehensive the fish surveys were and how appropriate the species data are for developing these site-specific criteria.

(p. 4) Please specify the specific dates (at least to the level of month) and exact locations of surveys used to summarize data for Table 2.

[19] Trout Unlimited. 2012. *Upper Blackfoot River Watershed Assessment and Identification of Priority Projects. Final. Prepared for the Upper Blackfoot River Initiative for Conservation.* February 1, 2012.

Section 4 Proposed Site-Specific Criteria for Selenium

Section 4.1 Summary of Approach to Developing a Fish-Tissue SSC

(Table 3) Please provide site-specific water column criterion elements that correspond with proposed fish tissue criterion elements. Nu-West is currently proposing site-specific selenium criteria, for which they have proposed modified fish tissue criterion elements. In addition, Nu-West is proposing to modify the water column criterion elements after this rulemaking, utilizing the performance-based approach that Idaho is proposing to adopt for site-specific adjustments to the water column elements in the statewide selenium criterion. EPA does not believe this is appropriate. The proposed SSC should reflect all 4 elements of the selenium criterion to be protective of aquatic life at the site. In addition, the performance-based approach is appropriate for modifying water column criterion elements utilizing the state-wide fish tissue criterion at a future date. In this case, when Nu-West is proposing site-specific criteria elements for fish tissue, there appears no reason for Nu-West to be unable to develop and propose site-specific water column translations. In the absence of such water-column elements, the EPA expects that the water column elements applicable statewide would be in effect in the waters covered by this site-specific proposal.

(p. 5, footnote 7) A description of the hydrology at each site would better qualify the statement in this footnote – *i.e.,* 'In streams or reaches of streams where fish are naturally absent due to low flow conditions.'

(p. 5) To perform a recalculation of the 304(a) criterion, the EPA recommends using the 2013 recalculation method (https://www.epa.gov/sites/production/files/2015-08/documents/revised_deletion_process_for_the_site-specific_recalculation_procedure_for_aquatic_life_criteria.pdf) to determine which species should be retained in the SSD, and then calculating the criterion using the four most sensitive genera according to the 1985 aquatic life criterion guidelines (https://www.epa.gov/sites/production/files/2016-02/documents/guidelines-water-quality-criteria.pdf). Using this process ensures that an appropriate regression is utilized to derive a criterion that is protective of 95% of the genera. The method often results in a value that is slightly lower than the most sensitive GMCV. For selenium, the dose-response curve is very steep, so a small increase in selenium concentration results in a disproportionately large effect on the organism. Given this, the EPA encourages the use of this conservative methodology for the derivation of the Nu-West fish tissue criterion elements. When this method is used the criterion for Georgetown Creek would be an egg-ovary criterion element of 20.60 mg selenium/kg dw, a muscle criterion element of 13.58 mg selenium/kg dw, and a whole-body criterion element of 10.27 mg selenium/kg dw. The criterion for Upper Blackfoot River using this method would be an egg-ovary criterion element of 22.31 mg selenium/kg dw, a muscle criterion element of 12.9 mg selenium/kg dw, and a whole-body criterion element of 9.86 mg selenium/kg dw. These values are generally more conservative than the currently proposed criteria. The currently proposed criterion for Georgetown Creek is an egg-ovary criterion element of 21.0 mg selenium/kg dw, a muscle criterion element of 12.8 mg/kg dw, and a whole-body criterion

element of 12.5 mg selenium/kg dw. The currently proposed criterion for the Upper Blackfoot River is an egg-ovary criterion element of 24.5 mg selenium/kg dw, a muscle criterion element of 12.8 mg/kg dw, and a whole body criterion element of 12.5 mg selenium/kg dw. While EPA recommends this methodology of criterion derivation, the use of the most sensitive species' SMCV may be appropriate if the State believes that all species within these sites have been identified and incorporated in the calculation.

Section 5.3.1 Genus Catostomus

The EPA would like to encourage Nu-West to use caution when interpreting the data from the de Rosemond et al. 2005 study. No control treatment was present in this study. The lack of controls complicates the interpretation of this study as certain types of deformities were classified as naturally occurring and were not included in the analyses of effects. Given these complications, it is difficult to draw definitive conclusions from this study. While collectively the studies presented for the family *Catosomidae* add some support to the demonstration that the proposed criteria are protective of this species, this information is not conclusive.

Section 6 Site-Specific Water Column Selenium Concentrations

It appears based on the report that for the derivation of the BAFs, multiple sculpin species were collected, as sculpin were only identified as "sculpin spp." rather than as a specific species. For deriving BAFs it is not appropriate to average together data from different species. If the fish were identified down to species level, then the sculpin data should be divided into its corresponding species.

Nu-West recommends in their report that "to correctly implement these site-specific water column values, it is necessary to utilize average results (i.e., not single values) of ambient dissolved selenium for comparison to the C_{target} and specifically that those results be averaged in the same way dissolved selenium concentrations were averaged to calculate site-specific BAFs." This language implies that Nu-West expects water concentrations to be averaged over the year from peak flow and base flow events. However, the frequency of the water column criterion value is a 30-day average and will be applicable as such. Assessment of the criterion should reflect the duration component of the criterion and should follow state implementation guidelines. EPA cautions that averaging the peak flow and the base flow water concentrations may result in missing the impacts of a large pulse of selenium. If that pulse occurs prior to a spawning event and affects reproductive females, it may result in reproductive impacts.

Table 10.

For Site BGTC-1, EPA would recommend calculating the water column criterion element solely from the brook trout data, rather than combining the brook trout data and the rainbow trout data. As the brook trout BAF is higher than the rainbow trout, this species is more sensitive, and a lower criterion is more appropriate to protect this species. When the data from the two fish species are combined, the resulting water column criterion element is likely not protective of brook trout.

Section 6.2.1 Sheep Creek
Please define the specific boundaries of the site-specific water column criterion elements. The water column value for Sheep Creek starts downstream of the confluence with South Fork Sheep Creek, but it is not stated how far down Sheep Creek this criterion applies.

Section 6.2.2.1 No Name Creek
The language referenced from Appendix K is intended to help understand the system and the downstream effects of selenium in the context of developing a site-specific criterion. It's not intended to indicate that fish tissue downstream should be used for criterion development in a fishless water, but rather whether the criterion set upstream in the fishless water is going to be protective of the fish communities downstream. In addition, the selenium criterion is an aquatic life criterion that is intended to protect the entire aquatic community, not just fish within the aquatic community. The method that was utilized to derive the water column criterion element for No Name Creek may result in a value that is not appropriate for that water body and is not protective of the entire aquatic community within that fishless water body. EPA requests that Nu-West provide additional information that demonstrates that the proposed water column criterion elements for No Name Creek are protective of the entire aquatic community of this creek.

Table 12 and Table 13.
In order to calculate the water column criterion elements for Angus Creek and No Name Creek, Nu-West has combined fish tissue data from two species, cutthroat trout and sculpin. EPA does not recommend combining data from the two species in order to calculate the water column criterion element. Rather, EPA recommends deriving a water column criterion element for each species and then selecting the more conservative value, so that protection of the more sensitive species is assured. EPA recognizes that for Angus Creek limited data were available, but that likely indicates that more data are necessary for deriving this criterion element rather than combining species data.

Table 13.
Fish tissue data for the development of the site-specific criterion for No Name Creek were a combination of fish sampled at BAC-2 and BAC-1. While it appears that BAC-2 is just downstream of the confluence of No Name Creek, BAC-1 appears to be much farther downstream. How far is BAC-1 from No Name Creek and why is it appropriate to consider fish tissue from this location in criterion development?

Section 6.3 Implementation
EPA regulations require states to assemble and evaluate all existing and readily available data and information to make assessment decisions for the 303(d) list. This means considering either water column data or fish tissue data, depending on which are available. If both are available, then the fish tissue data will supersede the water column data. The EPA does not support delaying an assessment decision due to the lack of fish tissue data, although future fish tissue data can be used to refine the assessment or demonstrate that a water body is not impaired.

Nu-West has suggested that when new data are collected during compliance monitoring, that they be used to update the site-specific water column criterion element. If this recalculation is conducted, this should be submitted to the EPA for approval if the BAF method is used to calculate the water column criterion elements utilizing the site-specific fish tissue criterion elements rather than the state-wide fish tissue criterion elements.

Figure 1.
Please define what the black lines represent and what the red and black line represents. Also please indicate where the mines are located on this map.

Appendix 1.
Please include what time of year water samples were collected in this table caption (which periods of time were averaged).

Attachment 1 and 2
Please provide copies of the actual species lists for the fish surveys. Please clarify whether all fish species identified in these surveys are listed in these tables or only those that were consistently found at these sites.