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February 25, 2021

Ref: 8WP-CWQ

Steven Ruffatto
Chair, Montana Board of Environmental Review
Montana Department of Environmental Quality
Metcalf Building, 1520 East Sixth Avenue
P.O. Box 200901
Helena, Montana 59620-0901

Subject: EPA's action on Montana's Revised Selenium Criteria for Lake Koocanusa and the Kootenai River (ARM 17.30.632 & ARM 17.30.602(32))

Dear Mr. Ruffatto:

The U.S. Environmental Protection Agency (EPA) has completed its review of Montana's revised water quality standards (WQS) and is approving the Administrative Rules of Montana (ARM) 17.30.632 and 17.30.602(32) as described in the enclosure to this letter. Receipt of the submission on December 28, 2020, initiated EPA's review of the revised WQS pursuant to Section 303(c) of the Clean Water Act (CWA) and the implementing federal WQS regulation (40 C.F.R. Part 131). The submission included: (1) the revised WQS adopted by the Board of Environmental Review on December 11, 2020 now codified at ARM 17.30.632 and 17.30.602(32); (2) rulemaking documents including a Technical Support Document, public notices, public comments, and response to comments; (3) transcript of the public hearing on November 5, 2020; and (4) Special Assistant Attorney General's certification that the WQS were duly adopted pursuant to state law. Although the new and revised rules took effect under state law on December 25, 2020, the EPA's approval under CWA Section 303(c) is required before the WQS are effective for CWA purposes.

Clean Water Act Review Requirements

CWA section 303(c)(2), requires states and authorized Indian tribes[1] to submit new or revised WQS to EPA for review. EPA is required to review and approve, or disapprove, the submitted standards. Pursuant to CWA § 303(c)(3), if EPA determines that any standard is not consistent with the applicable requirements of the Act, the Agency shall, no later than the ninetieth day after the date of submission, notify the state or authorized tribe and specify the changes to meet the requirements. If such changes are not adopted by the state or authorized tribe within ninety days after the date of notification, EPA is to promptly propose and then promulgate such standard pursuant to CWA section 303(c)(4). The Region's

[1] CWA section 518(e) specifically authorizes EPA to treat eligible Indian tribes in the same manner as states for purposes of CWA section 303. *See also* 40 C.F.R. § 131.8.

goal has been, and will continue to be, to work closely with states and authorized tribes throughout the water quality standards development process to ensure that statutory and regulatory requirements are clear. Pursuant to 40 C.F.R. § 131.21(c), new or revised state standards submitted to EPA after May 30, 2000, are not effective for CWA purposes until approved by EPA.

Today's Action

Montana adopted revised selenium criteria for the protection of the Class B-1 designated uses[2] for the portions of Lake Koocanusa and the Kootenai River (summarized in Table 1) in Montana. 40 C.F.R. § 131.11 describes the regulatory requirements for water quality criteria. Today's action addresses submitted changes to ARM 17.30.602(32) and 17.30.632 that include new or revised WQS requiring EPA's review and action under CWA section 303(c). EPA is approving ARM 17.30.602(32) and 17.30.632, except for portions of ARM 17.30.632(4) and 17.30.632(6) that EPA has determined are not new or revised WQS requiring EPA action pursuant to CWA section 303(c). The rationale for EPA's decisions is in the enclosure.

Selenium criteria adopted by Montana for Lake Koocanusa and the Kootenai River

Media Type	Fish Tissue		Water Column
Criterion Element	Egg/Ovary	Whole Body or Muscle	Monthly Average Exposure
Magnitude	15.1 mg/kg dw	Whole Body 8.5 mg/kg dw Muscle 11.3 mg/kg dw	Lake Koocanusa 0.8 µg/L Kootenai River 3.1 µg/L
Duration	Instantaneous measurement	Instantaneous measurement	30 days
Frequency	Not to be exceeded	Not to be exceeded	Shall not be exceeded more than once in three years, on average

Endangered Species Act Requirements

EPA's approval of Montana's revised selenium criteria submitted on December 28, 2020 is in compliance with the Endangered Species Act (ESA), 16 U.S.C. § 1536 *et seq*. Under Section 7(a)(2) of the ESA, EPA must ensure that its approval of these modifications to Montana's WQS is not likely to jeopardize the continued existence of threatened and endangered species or result in the destruction or adverse modification of designated critical habitat of such species. EPA initiated consultation with the US Fish and Wildlife Service (USFWS) regarding the potential effects of this action on April 28, 2020 via an email sent to Jacob Martin, Assistant Field Supervisor, Montana Ecological Services Field Office. EPA kept the USFWS apprised of the state's development of the criteria throughout 2020. EPA sent a final Biological Evaluation to the USFWS on February 18, 2021. EPA received a letter from the USFWS on February 25, 2021 concurring with EPA's determination that approval of Montana's revised water quality standards for selenium "may affect, but is not likely to adversely affect" either the bull trout and its designated critical habitat or the white sturgeon within the action area.

[2] Class B-1 includes the following designated uses: drinking, culinary, and food processing purposes after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply. See ARM 17.30.609 and ARM 17.30.623.

Indian Country

EPA's approval of Montana's submitted WQS does not extend to Indian country as defined in 18 U.S.C. §1151. Indian country generally includes (1) lands within the exterior boundaries of the following Indian reservations located within Montana: the Blackfeet Indian Reservation, the Crow Indian Reservation, the Flathead Reservation, the Fort Belknap Reservation, the Fort Peck Indian Reservation, the Northern Cheyenne Indian Reservation, and the Rocky Boy's Reservation; (2) any land held in trust by the United States for an Indian tribe; and (3) any other areas that are "Indian country" within the meaning of 18 U.S.C. §1151. Today's action is not intended as an action to approve or disapprove WQS for waters within Indian country. EPA, or eligible Indian tribes, as appropriate, retain responsibilities under CWA section 303 in Indian country.

Conclusion

EPA commends Montana for collaborating with multiple stakeholders for over five years to develop a site-specific selenium water column element for Lake Koocanusa consistent with the approaches recommended by EPA for developing site-specific selenium criteria. The adoption of fish tissue criterion elements for Lake Koocanusa as well as fish tissue elements and a water column criterion element for the Kootenai River that are the same as the current EPA recommended selenium criterion elements are also important improvements. We thank Montana for your work to protect and improve these waters and look forward to continued partnership in this watershed. If you have any questions, please contact Tonya Fish on my staff at fish.tonya@epa.gov.

Sincerely,

JUDY BLOOM

Digitally signed by JUDY BLOOM
Date: 2021.02.25 15:31:06 -07'00'

Judy Bloom
Manager, Clean Water Branch

Enclosure

Rationale for the EPA's Approval of Revised Selenium Criteria for Lake Koocanusa and the Kootenai River (ARM 17.30.632 and ARM 17.30.602(32))

Water quality standards (WQS) include: (1) designated uses; (2) water quality criteria that support the designated uses; (3) antidegradation requirements; and optional general policies. 40 C.F.R. Part 131. At issue in this action are water quality criteria for selenium adopted by Montana for the protection of the Class B-1 designated uses[3] in Lake Koocanusa and the Kootenai River (ARM 17.30.632 and ARM 17.30.602(32)).[4]

1. Clean Water Act and 40 C.F.R. Part 131 Requirements Relevant to Water Quality Criteria

Clean Water Act (CWA) section 101(a)(2) establishes as a national goal the achievement of water quality that provides for the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water. CWA section 304(a)(1) requires EPA to develop and publish and, from time to time, revise national recommended criteria for protection of water quality and human health that accurately reflect the latest scientific knowledge. Water quality criteria developed under CWA section 304(a) are based solely on data and scientific judgments on the relationship between pollutant concentrations and environmental and human health effects. CWA section 304(a) criteria do not reflect consideration of economic impacts or the technological feasibility of meeting pollutant concentrations in ambient water.

EPA uses Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses (1985) (commonly referred to as the "1985 Guidelines" or "Aquatic Life Guidelines" and hereafter referred to in this document as "Aquatic Life Guidelines") to derive 304(a) criteria recommendations to protect aquatic life from the effects of toxic pollutants. These Aquatic Life Guidelines describe an objective way to estimate the highest concentration of a substance in water that will not present a significant risk to the aquatic organisms in the water. This EPA method relies primarily on acute and chronic laboratory toxicity data for aquatic organisms from eight taxonomic groups reflecting the distribution of aquatic organisms' taxa that are intended to be protected by water quality criteria.

EPA's WQS regulation at 40 C.F.R. Part 131 interprets and implements CWA sections 101(a)(2) and 303(c). 40 C.F.R. § 131.11(a)(1) requires that water quality criteria adopted by states and authorized tribes[5] "be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use." For waters with multiple use designations, the criteria must support the most sensitive use. Designated uses are those uses specified in WQS for each water body or segment whether or not they are being attained (40 C.F.R. § 131.3(f)). In other words, designated uses establish the environmental objectives for each water body (*e.g.*, aquatic life, recreation, drinking water, agriculture,

[3] Class B-1includes the following designated uses: drinking, culinary, and food processing purposes after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply. See ARM 17.30.609 and ARM 17.30.623.
[4] See www.mtrules.org/gateway/Subchapterhome.asp?scn=17%2E30.6.
[5] CWA section 518(e) specifically authorizes the EPA to treat eligible Indian tribes in the same manner as states for purposes of CWA section 303. See also 40 C.F.R. § 131.8.

etc.). Numeric criteria may be based on EPA's CWA section 304(a) guidance, CWA section 304(a) guidance modified to reflect site-specific conditions, or other scientifically defensible methods (40 C.F.R. § 131.11(b)). CWA section 510 and EPA's CWA implementing regulations allow states to adopt water quality standards that are more stringent than may be strictly necessary under federal law.[6]

2. Background

Montana's revised selenium criteria are applicable to the surface waters of Lake Koocanusa and the Kootenai River within Lincoln County, Montana. The Kootenay River (note different spelling in British Columbia) originates in southeast British Columbia and flows south into Montana near the town of Eureka. The river is impounded by Libby Dam, creating Lake Koocanusa. Downstream of Libby Dam, the Kootenai River flows west into Idaho and then north into British Columbia, forming Kootenay Lake (see Figure 1).

Selenium is an essential micronutrient and low levels of selenium in the diet are required for normal cellular function in almost all animals. However, selenium at amounts not much above the required nutritional levels can have toxic effects on aquatic life and aquatic-dependent wildlife, making it one of the most toxic of the biologically essential elements. Egg-laying vertebrates have a lower tolerance for selenium than do mammals, and the transition from levels of selenium that are biologically essential to those that are toxic for these species occurs across a relatively narrow range of exposure concentrations. Elevated selenium levels above what is nutritionally required in fish and other wildlife inhibit normal growth and reduce reproductive success through effects that lower embryo survival, most notably teratogenesis (i.e., embryo/larval deformities). The deformities associated with exposure to elevated selenium in fish may include skeletal, craniofacial, and fin deformities, and various forms of edema that result in mortality. Elevated selenium exposure in birds can reduce reproductive success including decreased fertility, reduced egg hatchability (embryo mortality), and increased incidence of deformities in embryos.

Scientific studies indicate that selenium toxicity to aquatic life and aquatic-dependent wildlife is driven by diet (i.e., the consumption of selenium contaminated prey) rather than by direct exposure to dissolved selenium in the water column. Unlike other bioaccumulative contaminants such as mercury, the single largest step in selenium accumulation in aquatic environments occurs at the base of the food web where algae and other microorganisms accumulate selenium from water. The vulnerability of a species to selenium toxicity is determined by a number of factors in addition to the amount of contaminated prey consumed. A species' sensitivity to selenium, its population status, and the duration, timing and life stage of exposure are all factors to consider. In addition, the hydrologic conditions and water chemistry of a water body affect bioaccumulation; in general, slow-moving, calm waters or lentic waters enhance

[6] *See* 40 C.F.R. 131.4(a) ("As recognized by section 510 of the Clean Water Act, States may develop water quality standards more stringent than required by this regulation."); *see also City of Albuquerque v. Browner*, 97 F.3d 415, 423 (10th Cir. 1996) (noting "states' inherent right to impose standards or limits that are more stringent than those imposed by the federal government").

the production of bioavailable forms of selenium (selenite), while faster-moving waters or lotic waters limit selenium uptake given the rapid movement and predominant form of selenium (selenate).[7]

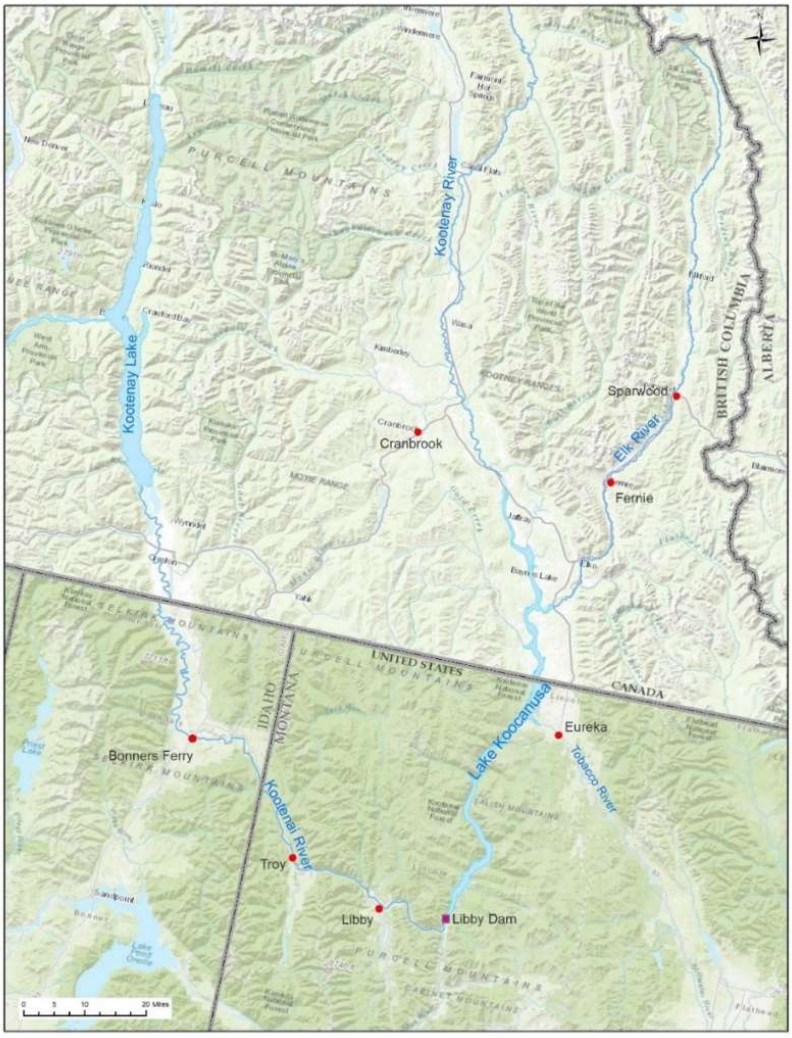

Figure. 1 Map of Lake Koocanusa and the Kootenai River

3. EPA Recommended Selenium Criterion

EPA's national recommended water quality criterion for selenium (EPA 2016),[8] developed by EPA in accordance with CWA section 304(a), provides recommendations to states and authorized tribes to establish WQS pursuant to the CWA. EPA 2016 recommends states/authorized tribes adopt one selenium criterion composed of four criterion elements: two fish tissue criterion elements (egg/ovary and whole body and/or muscle) and two water column criterion elements (30-day average and intermittent exposure). The water column criterion elements are further refined into values for lentic

[7] Excerpt from 83 Fed. Reg. 64063 (December 13, 2018).
[8] See www.epa.gov/wqc/aquatic-life-criterion-selenium.

waters (e.g., lakes/reservoirs) and lotic waters (e.g., streams/rivers) because selenium bioaccumulates differently in these two water body types. Adopting all four criterion elements ensures protection when fish tissue data are unavailable (See Table 1 below).

Table 1. Summary of EPA's Freshwater Selenium Ambient Chronic Water Quality Criterion for Protection of Aquatic Life.

Media Type	**Fish Tissue[1]**		**Water Column[4]**	
Criterion Element	**Egg/Ovary [2]**	**Fish Whole Body or Muscle [3]**	**Monthly Average Exposure**	**Intermittent Exposure[5]**
Magnitude	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	$$WQC_{int} = \frac{WQC_{30-day} - C_{bkgrnd}(1 - f_{int})}{f_{int}}$$
Duration	Instantaneous measurement[6]	Instantaneous measurement[6]	30 days	Number of days/month with an elevated concentration
Frequency	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

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 and are derived from fish tissue values via bioaccumulation. Water column values are the applicable criterion element in the absence of steady-state fish tissue measurements.

5. Where WQC30-day is the water column monthly element, for either a lentic or lotic waters; C_{bkgrnd} is the average background selenium concentration, and f_{int} is the fraction of any 30-day period during which elevated selenium concentrations occur, with fint 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.

EPA recognizes selenium bioaccumulation potential depends on the structure of the food web, hydrology, and several biogeochemical factors that characterize a particular aquatic system. Therefore, site-specific water column criterion element values may be necessary at aquatic sites with high selenium bioaccumulation to ensure adequate protection of aquatic life. In its CWA section 304(a) criterion, EPA

provided two methods[9] for translating the recommended fish tissue criterion elements into site-specific water column criterion elements:

- Mechanistic model – uses scientific knowledge of aquatic system food webs to establish a relationship between the concentration of selenium in the water column and the concentration of selenium in fish tissue. EPA worked with the United States Geological Survey (USGS) to derive a translation equation utilizing a mechanistic model of bioaccumulation previously published in peer-reviewed scientific literature to derive recommended water column criterion elements.
- Empirical Bioaccumulation Factor (BAF) model – uses direct measurement of selenium concentrations in both the water column and fish tissue to calculate the ratio of the two concentrations. The ratio (BAF) can then be used to estimate the target concentration of selenium in the water column as related to the target fish tissue criterion element.

4. Montana's Revised Selenium Criteria for Lake Koocanusa and the Kootenai River

Montana adopted revised selenium criteria to protect Class B-1 designated uses in Lake Koocanusa and the Kootenai River that are consistent with the recommendations in EPA 2016 for fish tissue and water column criterion elements (summarized in Table 2). For the Kootenai River, Montana adopted the EPA 2016 recommended water column criterion element for lotic waters. For Lake Koocanusa, Montana used the EPA 2016 recommended mechanistic model method for translating the recommended fish tissue criterion elements into a site-specific water column criterion element. The selenium criteria in Department Circular DEQ-7 of 5 µg/L (chronic) and 20 µg/L (acute) continue to apply for CWA purposes for the rest of Montana.[10]

Table 2. Selenium criteria adopted by Montana for Lake Koocanusa and the Kootenai River

Media Type	Fish Tissue		Water Column
Criterion Element	Egg/Ovary	Whole Body or Muscle	Monthly Average Exposure
Magnitude	15.1 mg/kg dw	Whole Body 8.5 mg/kg dw Muscle 11.3 mg/kg dw	Lake Koocanusa 0.8 µg/L Kootenai River 3.1 µg/L
Duration	Instantaneous measurement	Instantaneous measurement	30 days
Frequency	Not to be exceeded	Not to be exceeded	Shall not be exceeded more than once in three years, on average

The egg/ovary criterion element supersedes the whole body or muscle criterion element. The fish tissue criterion elements supersede the water column elements only when the water bodies are in steady state (see section 5.2).

[9] Appendix K provides recommendations and examples for developing site-specific selenium criteria at www.epa.gov/sites/production/files/2016-07/documents/aquatic_life_awqc_for_selenium_-_freshwater_2016.pdf.
[10] See deq.mt.gov/Portals/112/Water/WQPB/Standards/PDF/DEQ7/DEQ-7.pdf.

5. EPA Analysis and Rationale for Approval

5.1 Selenium Criteria

40 C.F.R. § 131.11(a)(1) requires that water quality criteria adopted by states and authorized tribes "be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use."[11] For waters with multiple use designations, the criteria must support the most sensitive use. For the reasons discussed below, EPA has concluded that Montana's revised selenium criteria are both supported by a sound scientific rationale and based on EPA's 304(a) national recommended criteria as permitted by 40 C.F.R. 131.11(b)(1).

5.1.1 Protection of Designated Uses

Both Lake Koocanusa and the Kootenai River are designated Class B-1, which includes the following designated uses: drinking, culinary, and food processing purposes after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.[12] Montana determined in *Derivation of a Site-Specific Water Column Selenium Standard for Lake Koocanusa* (MT TSD) [13] that the most sensitive designated use for selenium is growth and propagation of salmonid fishes and associated aquatic life (see MT TSD sections 1.31, 2.3.5 and 3.6).

EPA's CWA section 304(a) recommended selenium criteria for the protection of human health are 170 µg/L (consumption of water + organism) and 4200 µg/L (consumption of organism only),[14] and are much less stringent than the CWA section 304(a) recommended water column criterion element for the protection of aquatic life in EPA 2016 of 1.5 µg/L (lentic) and 3.1 µg/L (lotic) (See Table 1). Montana adopted the Maximum Contaminant Level established by EPA under the Safe Drinking Water Act of 50 µg/L for the protection of human health[15] (see Department Circular DEQ-7), which is less stringent than the EPA 2016 water column criterion element. Therefore, selenium criteria adopted by states/authorized tribes that protect aquatic life are expected to also protect humans.

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[11] For the reasons explained herein, EPA has concluded that the state's water quality standard submission is supported by a sound scientific rationale. EPA notes that its charge under federal law is to review state water quality criteria submissions only to ensure that sound science shows they are protective of the designated use, not to determine whether the precise value selected by the state is the most scientifically rigorous number possible. EPA's regulations at 40 C.F.R. 131.4(a) expressly preserve states' right to "develop water quality standards more stringent than required." Accordingly, once EPA has determined that sound scientific rationale shows that a state submission is protective of the designated use, its role under the cooperative federalism framework of the CWA is not to second guess the state's scientific analysis. *See City of Albuquerque v. Browner*, 97 F.3d 415, 426 (10th Cir. 1996) ("If the proposed standards are more stringent than necessary to comply with the Clean Water Act's requirements, the EPA may approve the standards without reviewing the scientific support for the standards"); *Ctr. for Regulatory Reasonableness v. United States Envtl. Prot. Agency*, No. CV 16-1435, 2019 WL 1440303, at *10 (D.D.C. Mar. 31, 2019) ("States are expressly empowered to adopt criteria substantially below any hypothetical 'impairment threshold'").

[12] See ARM 17.30.609 and ARM 17.30.623.

[13] See deq.mt.gov/Portals/112/Water/WQPB/Standards/Koocanusa/TSD_Lake%20Koocanusa_Sep2020_Final.pdf.

[14] See www.epa.gov/wqc/national-recommended-water-quality-criteria-human-health-criteria-table.

[15] See www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations.

Analyses conducted for the derivation of EPA 2016 concluded that available data indicates fish are more sensitive to selenium than amphibians, aquatic invertebrates, and plants. The EPA 2016 criterion is based on reproductive effects on fish and this is expected to also protect the less sensitive taxa in the aquatic community.

In addition, EPA completed a review of scientific literature related to the toxicity of selenium to aquatic-dependent wildlife, of which aquatic-dependent birds were determined to be the most sensitive taxa. EPA concluded that since the translated water column values for aquatic-dependent wildlife are equal or extremely close to EPA's 2016 selenium water column criterion elements, the EPA's 2016 selenium water column elements would also protect aquatic-dependent wildlife.[16]

In summary, EPA agrees with DEQ's identification of growth and propagation of salmonid fishes and associated aquatic life as the most sensitive designated use for Lake Koocanusa and the Kootenai River.

5.1.2 Sound Scientific Rationale

EPA criteria recommendations consist of three components: (l) magnitude - how much of a pollutant (or pollutant parameter such as toxicity), expressed as a concentration, is allowable; (2) duration - the period of time (averaging period) over which the instream concentration is averaged for comparison with criteria magnitudes (limits the duration of concentrations above the criteria magnitudes); and (3) frequency - how often criteria can be exceeded.[17] EPA 2016 recommends states/authorized tribes adopt one selenium criterion composed of four criterion elements: two fish tissue criterion elements (egg/ovary and whole body and/or muscle) and two water column criterion elements (30-day average and intermittent exposure).

5.1.2.1 Magnitude

Fish Tissue Criterion Elements

EPA developed a chronic criterion reflective of the reproductive effects of selenium concentrations on fish species, consistent with consensus recommendations of expert panels and with peer review and public comments on draft criteria. Based on the available dietary exposure data from lab studies and field exposures, the egg/ovary criterion element concentration is 15.1 milligrams selenium per kilogram dry weight (mg Se/kg dw) based primarily on 17 reproductive studies representing 12 fish species (10 fish genera). EPA applied the sensitivity distribution concepts from the *U.S. EPA Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses*[18] to derive the national selenium criterion. The Lake Koocanusa fish assemblage is represented in the EPA 2016 selenium toxicity database by quantitative reproductive toxicity values for 3 of 10 fish

[16] See *Aquatic Life* and *Aquatic-Dependent Wildlife Selenium Water Quality Criterion* for *Freshwaters* of *California* (Part 4), at www.epa.gov/sites/production/files/2019-03/documents/ca_statewide_se_tsd_508_compliant.pdf.
[17] See *Technical Support Document for Water Quality-based Toxics Control* (Section 2.2.1) at www3.epa.gov/npdes/pubs/owm0264.pdf.
[18] See www.epa.gov/wqc/guidelines-deriving-numerical-national-water-quality-criteria-protection-aquatic-organisms-and.

genera (13 fish species) that reside in Lake Koocanusa (Dolly Varden (surrogate for bull trout), rainbow trout, and Westslope cutthroat trout), and 1 genera (that resides in the Montana portion of the Kootenai River (white sturgeon). Although white sturgeon, the most sensitive species in the EPA 2016 dataset, do not reside in Lake Koocanusa, per 40 C.F.R. § 131.10(b), the criteria for Lake Koocanusa must provide for the attainment and maintenance of the WQS in the Kootenai River. Also, qualitative species or genus surrogate level tissue values for an additional 5 species (mountain whitefish, kokanee, largescale and longnose sucker, and redside shiner), were considered in the derivation process, leaving only 4 of 13 species unrepresented in the toxicity database. One of the important principles for site-specific criteria development established by the Selenium Technical Subcommittee during that process was that all fish species without toxicity data should be considered equally sensitive to the white sturgeon. Therefore, the white sturgeon tissue values would be applicable to the burbot, northern pikeminnow, peamouth chub, and yellow perch. The fish genera present in the Kootenai River are similarly represented by EPA's 2016 dataset, with a majority of the species in the river represented by either quantitative data for the specific species or qualitative data for species or genus level surrogates, and all fish species without toxicity data considered equally sensitive to the white sturgeon.

Selenium concentrations measured either in fish whole body or muscle tissue in non-reproductive studies (typically evaluating juvenile growth and survival), were available for 8 genera. Several studies measured whole body and muscle concentrations in reproductive studies concurrent with measurements in egg or ovary tissues resulting in directly measured chronic values for 2 genera. Whole body and muscle criterion elements were derived using these directly measured tissue concentration data, or by applying conversion factors (*CF*) to egg or ovary concentrations to derive species-specific whole body or muscle tissue concentrations. Then the sensitivity distribution concept was applied to distributions of whole body and muscle tissue concentrations to derive the whole body (8.5 mg Se/kg dw) and muscle (11.3 mg Se/kg dw) criterion elements. EPA determined that the egg/ovary criterion element was most relevant to the toxic manifestations of selenium in fish resulting in a hierarchal application of the tissue criterion where the egg/ovary criterion supersedes the whole body or muscle tissue criterion when fish egg/ovary concentrations are measured at a site.

Montana's revised selenium criteria in ARM 17.30.632 include fish tissue criterion elements that are the same as the recommended magnitudes in EPA 2016 for both Lake Koocanusa and the Kootenai River: egg/ovary 15.1 mg/kg dw, muscle 11.3 mg/kg dw, and whole body 8.5 mg/kg dw. EPA 2016 provides the basis for EPA's approval of these criterion elements.

Water Column Criterion Element for the Kootenai River

The water column criterion element (30-day average) that Montana adopted for the Kootenai River is the same as the recommended water column value in EPA 2016: 3.1 µg/L total dissolved selenium for lotic waters. EPA 2016 provides the basis for EPA's approval of this criterion element

Water Column Criterion Element for Lake Koocanusa

The site-specific water column criterion element for Lake Koocanusa was developed through a five year collaboration between DEQ and British Columbia Ministry of Environment and Climate Change Strategy (BC-ENV). The Lake Koocanusa Monitoring and Research Working Group and a Selenium

Technical Subcommittee were established to coordinate this work. Presser and Naftz (2020)[19] and the companion data release[20] that includes a comprehensive set of site-specific data compiled from public databases (Federal, State, and Provincial) and reports by Teck Coal Ltd., provided the foundational selenium modeling for both DEQ and BC-ENV to use to develop a protective water column criterion element for Lake Koocanusa that both Montana and British Columbia could then adopt through their respective regulatory processes.

For Montana, the culmination of this work was the adoption of the water column criterion element (30-day average) for Lake Koocanusa (0.8 µg/L total dissolved selenium). As described in more detail below, this criterion element was derived consistent with the mechanistic model method in EPA 2016 for translating the recommended fish tissue criterion elements into site-specific water column criterion elements.

The mechanistic model approach uses scientific knowledge of the bioaccumulation dynamics and aquatic food webs of a site to establish a relationship between the concentration of selenium in the water column and the concentration of selenium in fish tissue. Selenium dissolved in surface water enters aquatic food webs by assimilating into trophic level 1 primary producer organisms (e.g., algae) or adsorption to other biotic (e.g., detritus) and abiotic (e.g., sediment) particulate material. Organic particulate material is consumed by trophic level 2 organisms (usually aquatic invertebrates, but also some fish species that are herbivores/detritivores) resulting in the accumulation of selenium in the tissues of those organisms. Trophic level 2 organisms are then consumed by trophic level 3 organisms (typically fishes) resulting in accumulation of selenium in the tissues of those fish (and so on up the food web). The transfer of selenium up the food web can be characterized by a number of parameters and modeled with an equation. An enrichment factor (*EF*) characterizes the assimilation of dissolved selenium into the base of the food web by quantifying the partitioning of selenium between the dissolved and particulate state. Bioaccumulation of selenium from one trophic level to the next is quantified by a trophic transfer factor (*TTF)*. A conversion factor (CF), which establishes the ratio of selenium concentrations between different fish tissues, may also be used if the fish tissue being modeled is muscle or egg/ovary rather than whole body. These parameters are used in the mechanistic model with a target protective fish tissue selenium concentration (e.g., egg/ovary 15.1 mg/kg dw, muscle 11.3 mg/kg dw, or whole body 8.5 mg/kg dw), to derive a selenium water column criterion element that will ensure the protective fish tissue criterion element is met and will therefore be protective of the site-specific ecosystem.

EPA 2016 describes six steps for deriving a site-specific water column criterion element from the selenium egg/ovary criterion element using EPA's mechanistic model approach. Following is a summary of how the work of Presser and Naftz (2020) and additional work by Montana is consistent with the six steps.

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[19] Presser, T.S., and Naftz, D.L., 2020, Understanding and documenting the scientific basis of selenium ecological protection in support of site-specific guidelines development for Lake Koocanusa, Montana, U.S.A., and British Columbia, Canada: U.S. Geological Survey Open-File Report 2020–1098, 40 p., doi.org/ 10.3133/ ofr20201098.

[20] See Presser, T.S., and Naftz, D.L., 2020, Selenium concentrations in food webs of Lake Koocanusa in the vicinity of Libby Dam (Montana) and the Elk River (British Columbia) as the basis for applying ecosystem-scale modeling, 2008–2018: U.S. Geological Survey data release, doi.org/10.5066/P9VXYSNZ.

1) Identify the appropriate target fish species.

The overall goal of Presser and Naftz (2020) was to provide an ecosystem-scale model that illustrates the site-specific range of potential selenium exposure and bioaccumulation that can inform the basis for regulatory decision-making by Montana and British Columbia. Therefore, they did not select one target fish species and instead provided generalized food webs based on fish species present that could be further refined by the respective governments. Presser and Naftz (2020) used available Lake Koocanusa data including fish species abundance and fish catches to identify fish species present. Based on recommendations from the Selenium Technical Subcommittee, twelve species of fish were considered as potential target species for the modeling: bull trout, burbot, kokanee, longnose sucker, largescale sucker, mountain whitefish, northern pikeminnow, peamouth chub, rainbow trout (wild strain), redside shiner, Westslope cutthroat trout, and yellow perch. Species-specific dietary data summarized as percentage of taxa-specific invertebrate biomass, recent selenium concentrations for invertebrate taxa in 2018, and a study of the contents of the stomachs of fish species caught in 2017 were used to assign each fish species to a generalized food-web category to reduce the number of modeling scenarios. Two generalized food-web categories were identified and modeled: an invertebrate to fish model (IFM) and a trophic fish model (TFM). The IFM is based on fish consuming only invertebrates (i.e., zooplankton and/or insects) and protects a community of rainbow trout, Westslope cutthroat trout, redside shiner, longnose sucker, peamouth chub, largescale sucker, mountain whitefish, and kokanee. The TFM is based on forage fish (trophic level 3 (TL3)) consuming invertebrates and predator fish (trophic level 4 (TL4)) consuming forage fish and protects a community of bull trout, burbot, and northern pikeminnow.

In general, EPA recommends selecting fish species in the aquatic system with the greatest selenium sensitivity and bioaccumulation potential. Presser and Naftz (2020) provided a qualitative vulnerability ranking for Lake Koocanusa fish species. The most vulnerable species include the redside shiner, peamouth chub, and northern pikeminnow based on sensitivity and burbot based on its demersal feeding and winter spawning period. Given this, Montana followed the recommendation of the Selenium Technical Subcommittee to use the more conservative TFM model food web for protection of potentially sensitive piscivorous species and species of cultural importance (see MT TSD section 5.1.3).

2) Model the food web of the targeted fish species.

Presser and Naftz (2020) used available Lake Koocanusa data including dietary metrics for fish and invertebrate taxa in fish stomachs to develop two primary food web models: IFM and TFM. Montana selected the TFM for modeling the water column value. Montana then selected the version of this model that resulted in the greatest bioaccumulation potential. This was the model that represents TL4 fish consuming 100% TL3 fish which consume 100% aquatic insects (chironomids).

3) Identify appropriate trophic transfer factor (*TTF)* values by either:
   a. selecting the appropriate *TTF* values from a list of EPA 2016-derived values, or
   b. deriving *TTF* values from other existing data, or
   c. deriving *TTF* values by conducting additional studies, or
   d. extrapolating *TTF* values from existing values.

Following option b and Presser and Naftz (2020), Montana used previously published laboratory-derived *TTFs* from Presser and Luoma (2010)[21]: 2.8 (aquatic insects), 1.5 (zooplankton), and 1.1 (fish). The mean "all insect" *TTF* (2.8) that Presser and Naftz (2020) used to model Lake Koocanusa is composed of: mayfly, caddisfly, cranefly, stonefly, damselfly, corixid (waterboatmen), and chironomid (midge). The zooplankton *TTF* reflects a zooplankton composite and the fish *TTF* is the mean of all fish species included in Presser and Luoma (2010). These *TTFs* are not identical to those that EPA used in EPA 2016 but are close in magnitude to those in EPA 2016 and scientifically defensible. Montana did not use site-specific *TTFs* due to data limitations identified in Presser and Naftz (2020).

4) Determine the appropriate value of *EF* (enrichment factor) by either:
   a. deriving a site-specific *EF* value from current field measurements, or
   b. deriving an appropriate *EF* value from older existing data, or
   c. extrapolating from *EF* values of similar waters.

Montana derived site-specific *EF* values from field measurements (option a above). Presser and Naftz (2020) and Montana used the term K_d instead of *EF* to describe the relationship between selenium concentrations in particulate and dissolved phases. EPA 2016 indicates that the K_d (or *EF*) is the most influential model parameter and therefore the most critical element for which to use site-specific data. Available data included a robust dataset of 87 matched samples for particulate and dissolved selenium collected over multiple years (2015-2019), seasons, and water depths. Rather than selecting a single representative value from the K_d dataset to use in the model, Presser and Naftz (2020) present each K_d calculation as an independent scenario (n=87), resulting in 87 predicted dissolved selenium concentrations for each model scenario. Montana used this distribution of K_d*'s* and resulting dissolved selenium concentrations to derive their water column criterion element.

5) Determine the appropriate *CF* (conversion factor) value by either:
   a. selecting the appropriate *CF* value from a list of EPA 2016-derived values, or
   b. deriving a *CF* value from other existing data, or
   c. deriving a *CF* value by conducting additional studies, or
   d. extrapolating a *CF* value from existing values.

[21] Presser, T.S., and Luoma, S.N., 2010, A methodology for ecosystem-scale modeling of selenium: Integrated Environmental Assessment and Management, v. 6, no. 4, p. 685–710, doi.org/ 10.1002/ ieam.101.

A conversion factor (*CF*) quantifies the relationship between the concentration of selenium in the eggs and/or ovaries and the concentration of selenium in the whole body or muscle tissues of fish. Montana used EPA's whole body tissue guideline (8.5 mg/kg dw) in their modeling, therefore no *CF* was needed.

6) Translate the applicable fish tissue element into a site-specific water concentration value.

To derive a site-specific water column criterion element for Lake Koocanusa that is protective of the chosen fish tissue criterion elements, Montana used the mechanistic model to translate the whole body fish tissue criterion element into a water column criterion element using the following equation:

$$C_{water\ column\ criterion\ element} = \frac{C_{whole\ body\ criterion\ element}}{TTF^{composite} \times (K_d/1000) \times \text{SPM \% bioavailability}}$$

$C_{water\ column\ criterion\ element}$	=	translated site-specific water column criterion element (µg/L),
$C_{whole\ body\ criterion\ element}$	=	whole body fish tissue criterion element (µg/g),
$TTF^{composite}$	=	product of the trophic transfer factor (TTF) values in each trophic level of the food web of the target fish model (no units of measurement),
K_d	=	environmental partitioning factor (L/g),
SPM % bioavailability	=	percent bioavailability of suspended particulate matter

Montana used the following values to populate the equation:

$C_{whole\ body\ criterion\ element}$	=	8.5 µg/g,
$TTF^{composite}$	=	$TTF^{TL4Fish}$ x $TTF^{TL3Fish}$ x $TTF^{aquatic\ insects}$ = 1.1 x 1.1 x 2.8 = 3.39
K_d	=	75th percentile of distribution
SPM % bioavailability	=	60%

The use of these values results in a water column criterion element of 0.8 µg/L. Although this criterion element is more stringent than the recommended water column criterion element for lentic aquatic systems in EPA 2016 (1.5 µg/L), based on the state's technical documentation included in its submission, summarized above, EPA concludes that it is supported by a sound scientific rationale.[22]

As Montana adopted the EPA 2016 recommended fish tissue criterion elements, the whole body criterion element that was used in this translation was the value of 8.5 µg/g dw. The $TTF^{composite}$ used in this translation was calculated using the TFM and fish and invertebrate *TTFs* from Presser and Luoma 2010. As presented in step 3 above, the use of existing *TTFs* is an approach recommend in EPA 2016.

As presented in Presser and Naftz (2020), Montana also included a bioavailability factor for suspended particulate matter in the model, which reflects the bioavailability of selenium from particulate matter to organisms in the ecosystem. In validation runs of the model, Presser and Naftz (2020) showed that a

[22] As noted above, the possibility that this criterion element may be more stringent than necessary to protect the designated use would not provide a valid legal justification under Section 303(c) of the CWA or EPA's implementing regulations for disapproval. *See* 40 C.F.R. 131.4(a).

60% bioavailability factor better represented the measured invertebrate and zooplankton selenium concentration in Lake Koocanusa than a 100% bioavailability factor.

Lastly, Montana selected the 75th percentile of the K_d distribution for the translation. This is a conservative K_d value protective of a majority of the scenarios observed in Lake Koocanusa.

Intermittent Criterion Element

In addition to the monthly exposure water column criterion element discussed above, EPA 2016 includes a recommended intermittent exposure water column criterion element. Montana did not adopt an intermittent exposure water column criterion element for either Lake Koocanusa or the Kootenai River. The state's rationale in the response to comments is "The intermittent exposure element is unnecessary because MPDES [Montana Pollutant Discharge Elimination System] rules do not differentiate between intermittent and continuous discharges for purposes of developing water quality-based effluent limits. When calculating the reasonable potential for a discharger to cause or contribute to an exceedance of a water quality standard, DEQ methods treat continuous and intermittent dischargers the same."[23] The MPDES program uses the maximum effluent concentration during the period of record to evaluate reasonable potential for a discharge to cause or contribute to an exceedance of a water quality standard.[24] EPA concludes Montana's approach will protect the applicable designated uses without the intermittent exposure water column criterion element. EPA notes that there are currently no public or private entities discharging to the Kootenai River or Lake Koocanusa with MPDES permit effluent limits for selenium.[25]

5.1.2.2. Duration

EPA's recommended duration for the water criterion elements is 30 days. EPA 2016 provides a detailed analysis for the derivation of a 30-day averaging period. This differs from typical criteria averaging periods based on EPA's 1985 Guidelines, where the basis for the criterion averaging period is a time period less than or equal to the "characteristic time," which describes the toxic speed of action due to direct waterborne toxicity of metals. The derivation of the averaging period for the selenium water column concentration was based on the kinetics of bioaccumulation and depuration rates for different trophic levels. The duration for Montana's water column criterion elements for Lake Koocanusa and the Kootenai River is specified as "30-day average" in ARM 17.30.632(7), which is consistent with EPA 2016.

EPA's recommended duration for the fish tissue criterion elements is instantaneous because fish tissue data provide point measurements that reflect integrative accumulation of selenium over time and space in the fish populations(s) at a given site. The fish reflect bioaccumulation of selenium that has already occurred and reflect the extended exposure to selenium in the water body. The duration for Montana's fish tissue criterion elements for Lake Koocanusa and the Kootenai River is specified as "instantaneous" in ARM 17.30.632(6), which is consistent with EPA 2016.

[23] Notice of Amendment and Adoption p. 2394, response to comment #186.
[24] September 4, 2020 email from Myla Kelly to Tonya Fish.
[25] Notice of Amendment and Adoption p. 2343, response to comment #26.

5.1.2.3 Frequency

The recommended frequency in EPA 2016 of once in three years on average is based on the ability of an aquatic ecosystem to recover when pollutant impacts are associated exclusively with water column exposure.[26] The frequency for Montana's water column criterion elements for Lake Koocanusa and the Kootenai River is specified as "shall not be exceeded more than once in three years, on average" in ARM 17.30.632(7), which is consistent with EPA's recommendations in the 1985 Guidelines for water column criteria and in EPA 2016.

The recommended frequency of exceedance in EPA 2016 for the fish tissue criterion elements of the selenium criterion is "not to exceed." Selenium is a bioaccumulative pollutant; therefore, elevated levels in various ecological compartments (e.g., biota, surficial sediments) require a long period to decrease, and the associated aquatic community requires a long time to recover following reduction or removal of an elevated selenium exposure to a given system. As selenium is bioaccumulative and the pathway for exposure is through the food web, the typical criteria return frequency of once in three years on average is not appropriate for selenium in fish tissue as this could lead to sustained ecological impacts. As fish tissue has a much longer recovery time than water column concentrations, a frequency of "not to exceed" is appropriate for the tissue criterion element. The frequency for Montana's fish tissue criterion elements for Lake Koocanusa and the Kootenai River is specified as "not to exceed" in ARM 17.30.632(6), which is consistent with EPA 2016.

5.2 Definition of Steady State and Criteria Element Hierarchy

Montana adopted ARM 17.30.602(32) and added this definition:

> "Steady state" means, for the purposes of ARM 17.30.632, conditions whereby there are no activities resulting in new, increasing, or changing selenium loads to the lake or river aquatic ecosystem, and selenium concentrations in fish living in the aquatic ecosystem have stabilized.

EPA 2016 does not include a definition of "steady state," but does recommend fish tissue elements of the selenium criterion supersede water column elements under steady state conditions because the selenium concentrations in fish tissues are a more sensitive and reliable indicator of the negative effects of selenium in aquatic life. EPA 2016 also states that fish tissue concentrations do not fully represent potential effects on fish and the aquatic ecosystem in areas with new selenium inputs:

> "New inputs are defined as new activities resulting in selenium being released into a lentic or lotic waterbody. New inputs will likely result in increased selenium in the food web, likely resulting in increased bioaccumulation of selenium in fish over a period of time until the new or increased selenium release achieves a quasi-'steady state' balance within the food web. EPA estimates that concentrations of selenium fish tissue will not

[26] See *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* (1985 Guidelines) at www.epa.gov/sites/production/files/2016-02/documents/guidelines-water-quality-criteria.pdf.

> represent a 'steady state' for several months in lotic systems, and longer time periods (e.g., two to three years) in lentic systems, depending upon the hydrodynamics of a given system such as the location of the selenium input related to the shape and internal circulation of the waterbody, particularly in reservoirs with multiple riverine inputs, hydraulic residence time, and the particular food web. Estimates of steady state under new or increased selenium input situations are expected to be site dependent, so local information should be used to better refine these estimates for a particular waterbody. Thus, EPA recommends that fish tissue concentration not override water column concentration in these situations until these periods of time have passed in lotic and lentic systems, respectively, or steady state conditions can be estimated." (EPA 2016 pp. 101-102).

Consistent with this, EPA 2016's Table 1 (also Table 1 of this enclosure) footnotes 1 and 4 specify that the fish tissue elements are expressed as steady-state and water column values are the applicable criterion element in the absence of steady-state condition fish tissue data.

The language above from EPA 2016 was intended to address the scenario where fish tissue data are not exceeding those criterion elements, but the water column data are exceeding that element. However, another scenario DEQ raised in discussions with EPA is how to address the situation where fish tissue data are exceeding those criterion elements, but the water column data are not. EPA advised that in that scenario, EPA would still consider the water body impaired.[27] In other words, if a water body is not in steady-state, it is considered impaired if either the fish tissue or water column elements are exceeded. As a result, Montana adopted the following language in ARM 17.30.632(2): "When the aquatic ecosystem is in steady state and selenium data is available for both fish tissue and the water column, the fish tissue standards supersede the water column standard. When the aquatic ecosystem is in non-steady state, both the fish tissue and water column standards apply." ARM 17.30.632(3) specifies that Lake Koocanusa and the Kootenai River are in non-steady state and the Department will reassess the status triennially and amend the rule if necessary.

EPA concludes that the definition of "steady state" in ARM 17.30.602(32), the criteria element hierarchy in ARM 17.30.632(2), and the statement in ARM 17.30.632(3) that Lake Koocanusa and the Kootenai River are not in steady state are consistent with EPA 2016.

5.3 Protection of Downstream Waters

40 C.F.R. § 131.10(b) requires that criteria provide for the attainment and maintenance of the WQS of downstream waters. Montana addressed this in section 6.2 of the MT TSD. The Kootenai River is downstream of Lake Koocanusa. The fish tissue criterion elements are the same for both water bodies: egg/ovary 15.1 mg/kg dw, muscle 11.3 mg/kg dw, and whole body 8.5 mg/kg dw. Lake Koocanusa's water column criterion element of 0.8 µg/L is more stringent than the water column criterion element of

[27] See September 2, 2020 email from Tonya Fish to Lauren Sullivan.

3.1 µg/L in the Kootenai River. Fish tissue and water column criterion elements are the same for the Kootenai River in Montana and the downstream segment of the Kootenai River in Idaho.[28]

Based on the information above, EPA concludes Montana's revised selenium criteria will provide for the attainment and maintenance of downstream uses.

5.4 EPA's Action

Based on the information above, EPA approves the revised selenium criteria in ARM 17.30.632 because they are "based on sound scientific rationale and … contain sufficient parameters or constituents to protect the designated use" as required by 40 C.F.R. § 131.11. The selenium criteria also provide for the attainment and maintenance of the WQS of downstream waters consistent with 40 C.F.R. § 131.10(b). In addition, EPA approves the definition of "steady state" in ARM 17.30.602(32) because it informs application of the revised criteria consistent with 40 C.F.R. § 131.11. As with all WQS, these provisions are subject to state review at least every three years pursuant to 40 C.F.R. § 131.20(a).

Today's action is limited to waters under Montana's jurisdiction and Montana's revised WQS that apply to Lake Koocanusa from the US-Canada international boundary to the Libby Dam as specified in ARM 17.30.632(6) and 7(a). EPA remains committed to continued collaboration with Montana, British Columbia, the Confederated Salish and Kootenai Tribes, Kootenai Tribe of Idaho, First Nations, and other interested parties.

6.0 Provisions That EPA Has Determined Are Not WQS

EPA has determined the following provisions are not WQS:[29]

- In ARM 17.30.632(4): "Permit conditions and limits developed from the water column standards comply with the fish tissue standards." This language does not describe a desired ambient condition of a waterbody to support a particular designated use. Rather, these statements provide information related to permit conditions.
- ARM 17.30.632(5): "No person may violate the numeric water quality standards in (6) and (7)." This language does not describe a desired ambient condition of a waterbody to support a particular designated use. Rather, these statements provide information related to criteria implementation.
- In ARM 17.30.632(6): "Fish tissue sample results shall be reported as a single value representing an average of individual fish samples or a composite sample, each option requiring a minimum number of five individuals from the same species." This language does not describe a desired ambient condition of a waterbody to support a particular designated use. Rather, these statements provide information related to sampling and monitoring for compliance with the criteria. The state has flexibility in how it interprets discrete fish samples, and it is reasonable to apply the

[28] See IDAPA 58.01.02.210.01 at adminrules.idaho.gov/rules/current/58/580102.pdf.
[29] See *What is a New or Revised Water Quality Standard Under CWA 303(c)(3)? Frequently Asked Questions* at www.epa.gov/sites/production/files/2014-11/documents/cwa303faq.pdf.

instantaneous fish tissue elements to a composite sample or average of individuals of the same species, as adopted by MT.

7.0 Conclusion

EPA commends Montana for collaborating with multiple stakeholders for over five years to develop a site-specific selenium water column element for Lake Koocanusa consistent with the approaches recommended by EPA for developing site-specific selenium criteria. The adoption of fish tissue criterion elements for Lake Koocanusa as well as fish tissue elements and a water column criterion element for the Kootenai River that are the same as the current EPA recommended selenium criterion elements are also important improvements. The adopted criteria are based on sound science including robust site-specific data for Lake Koocanusa showing that they protect the applicable designated uses of Lake Koocanusa and the Kootenai River.