BEFORE THE BOARD OF ENVIRONMENTAL REVIEW
OF THE STATE OF MONTANA

In the matter of the amendment of ARM 17.30.602 and the adoption of NEW RULE I pertaining to selenium standards for Lake Koocanusa and the Kootenai River)	NOTICE OF AMENDMENT AND ADOPTION (WATER QUALITY)

TO: All Concerned Persons

1. On October 9, 2020, the Board of Environmental Review (board) published MAR Notice No. 17-414, pertaining to the virtual public hearing on the proposed amendment and adoption of the above-stated rules at page 1789 of the 2020 Montana Administrative Register, Issue No. 19.

2. The board has amended ARM 17.30.602 exactly as proposed.

3. The board has adopted NEW RULE I (ARM 17.30.632) as proposed but with the following changes, stricken matter interlined, new matter underlined:

NEW RULE I (17.30.632) SELENIUM STANDARDS FOR LAKE KOOCANUSA AND THE KOOTENAI RIVER (1) through (5) remain as proposed.

(6) Fish tissue standards will be instantaneous measurements not to be exceeded. 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. Fish tissue standards are applicable to tissues of fish in Lake Koocanusa from the US-Canada international boundary to the Libby Dam and in the mainstem Kootenai River from the outflow below the Libby Dam to the Montana-Idaho border. Egg/ovary tissue standards supersede any muscle or whole-body standards, as well as the water column standards in (7), when fish egg/ovary samples are available and when the aquatic ecosystem is in steady state. When fish egg/ovary samples are unavailable, and the aquatic ecosystem is in steady state, fish muscle or whole-body standards supersede the water column standards in (7).

Fish Tissue	Selenium Concentration
Eggs/Ovaries	15.1 mg/kg dry weight (dw)
Muscle	11.3 mg/kg dw
Whole Body	8.5 mg/kg dw

(7) remains as proposed.

REASON: The changes to (6) are necessary to clearly specify the duration and frequency for the fish tissue standards. The fish tissue standard is an instantaneous measurement that is not to be exceeded. The fish tissue standard

may be based on a single value that represents an average of individual fish samples or a composite sample, each option, requiring a minimum of five individuals of the same species.

4. The board has thoroughly considered the comments received. A summary of the comments received and the board's responses are as follows:

List of Acronyms used in Responses to Comments

BAF – bioaccumulation factor
BC – British Columbia
BC-ENV- British Columbia Mistry of Environment
BER – Board of Environmental Review
CRT – Columbia River Treaty
DEQ – Department of Environmental Quality
dw – dry weight
EPA or US EPA – United States Environmental Protection Agency
EQC – Environmental Quality Council
FWP – Montana Department of Fish, Wildlife and Parks
Kd – Partitioning coefficient
KNC -Ktunaxa Nation Council
LKMRWG – Lake Koocanusa Monitoring and Research Working Group
MT – Montana
ppb – parts per billion
Se – Selenium
SeTSC – Selenium Technical Subcommittee
SPM – Suspended particulate matter
TTF – Trophic Transfer Factor
USGS – United States Geological Survey
USFWS – United States Fish and Wildlife Service
WPCAC – Water Pollution Control Advisory Council
WPIC – Water Policy Interim Committee

COMMENT NO. 1: Over 180 commenters voiced their support for the proposed limits on selenium pollution in Lake Koocanusa and the Kootenai River. Supporting standards to limit bioaccumulation of selenium in fish and the water will protect not only the aquatic environment, but also the biodiversity of nature, and the endpoint consumer.

RESPONSE: The board acknowledges the comments.

COMMENT NO. 2: We think the recommended standard for the Kootenai River of 0.3 µg/L should protect aquatic life and the sensitive fish species of the lower river.

RESPONSE: The board presumes the commenter meant 3.1 µg/L which is the proposed dissolved selenium standard for the Kootenai River. In that case, the board agrees and thanks you for your comment.

COMMENT NO. 3: Many commenters expressed support for the proposed limits on selenium pollution because they are needed to protect water quality, fish populations, and human health not just in Montana but also in Idaho. Without these limits, endangered populations of sturgeon and burbot in the Kootenai River are at risk. Selenium can also cause harm to people that consume fish with high levels of selenium.

RESPONSE: The board thanks you for your comments. Federal regulation at 40 CFR 131.10(b) requires the state to consider and ensure the attainment and maintenance of downstream (intra-and-interstate) water quality standards. The proposed standards for Lake Koocanusa and the Kootenai River are considered protective of downstream uses including the protection of downstream species listed under the Endangered Species Act. The proposed water quality standards were developed for the protection of aquatic life. Protection of human health was not considered in the development of the proposed standards. The proposed standards are designed to protect aquatic life. More study is necessary to determine whether selenium levels in fish tissue may adversely affect humans.

COMMENT NO. 4: We are confident that the required three-year review period will provide opportunity for adjustment and refinement as additional data gets collected.

RESPONSE: The board agrees with the comment. Consistent with 75-5-301(3), MCA, and 40 CFR 131.20, *Montana reviews water quality standards at least once every 3 years, considers public comments, and may revise classifications of state waters and applicable water quality standards as a result of this review.* Additionally, consistent with 75-5-702, MCA, the department continuously monitors state waters to assess water quality in partnership with state and federal agencies, and other stakeholders, and uses the results of these monitoring efforts to inform future triennial reviews.

COMMENT NO. 5: I think it is a shame the elected leaders in Libby and Eureka have determined there is no crisis while acknowledging they do not understand the study. I would like to thank the scientists who have been comprehensive in this ongoing study, and I would hope we adopt their conclusions as policy.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 6: The coal industry is trying to undermine and delay Montana's effort to adopt protective limits on selenium pollution. The new limits will be enforceable under an international treaty between the United States and Canada.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 7: Some commenters indicated that the EPA nationally recommended criterion of 1.5 µg/L for Lake Koocanusa should be adopted rather than the proposed 0.8 µg/L.

RESPONSE: The department followed the methodology outlined in Appendix K of the EPA 304(a) guidance document (EPA, 2016) for the derivation of site-specific selenium criteria for Lake Koocanusa. The department followed EPA

recommended mechanistic bioaccumulation modeling approach and determined that 1.5 µg/L is not protective of the aquatic life beneficial use for Lake Koocanusa.

COMMENT NO. 8: We recommend MDEQ adopt 1.5 as a performance-based value that is to be developed using site-specific data. The interim water value for lentic waters (1.5 µg/L) would serve as the criteria until such time a site-specific water criterion is derived.

RESPONSE: Following the methodology outlined in Appendix K of the EPA 304(a) guidance document (EPA, 2016), the department determined that 1.5 µg/L is not protective of the aquatic life beneficial use. See also, response to COMMENT NOs. 7, 9, and 177.

COMMENT NO. 9: DeForest (2020) provides evidence that the EPA (2016) lentic value of 1.5 µg/L is protective of Lake Koocanusa aquatic communities and those downstream, including white sturgeon.

RESPONSE: While DeForest (2020) provides an argument for why the EPA (2016) national lentic value is protective in Lake Koocanusa, his opinion differs from the majority of other state, federal, tribal, and academic scientists who believe the DEQ (2020) proposed site-specific criterion of 0.8 µg/L for Lake Koocanusa is protective. In examination of DeForest's (2020) analysis (see DeForest's Table 2), the department noted that 3 of the 8 scenarios with site-specific TTFs and Kds result in a water column criterion that would be appreciably less than the lentic value of 1.5 µg/L recommended by EPA (2016). In this regard, we find that the EPA (2016) lentic water column value is not protective of the aquatic life beneficial uses in Lake Koocanusa and a more stringent standard is required.

COMMENT NO. 10: The proposed standard of 0.8 µg/L is NOT based on the facts and science of the situation, but rather is being driven by anti-coal mining politics.

RESPONSE: The board does not agree with the comment. The department provides detailed analysis of the existing data, modeling methods, and assumptions in the technical support document (DEQ, 2020) housed on their website. Working with a scientifically peer-reviewed and published model and modeling parameters recommended by USGS and the SeTSC, the department identified a narrow range of candidate criteria—most of which were below 1 µg/L—which included the proposed standard of 0.8 µg/L. See also, response to COMMENT NO. 177.

COMMENT NO. 11: If the national lentic criterion (1.5 µg/L) is not considered protective for the lake, then how can the national lotic criterion (3.1 µg/L) be considered protective of the downstream receiving environment, particularly since the goal is aimed at the protection of white sturgeon?

RESPONSE: The national EPA recommended selenium criteria for lentic and lotic waterbodies is based on data at a national scale, and is thus generally applicable but with some waterbodies over or under protected. The rigorous scientific effort for Lake Koocanusa has shown that 1.5 µg/L is not protective of the aquatic life beneficial use. To date, no such analysis has been conducted for the Kootenai River, so the department is proposing adoption of the nationally

recommended criterion for lotic waterbodies because it is considered the best available science at this time for the Kootenai River.

COMMENT NO. 12: We urge the board to also be thoughtful, inclusive, and deliberative. This has been our experience with DEQ in the past and we are puzzled by this rulemaking, which appears to depart from that practice. This is particularly alarming here, where the proposed standard is only a fraction of the existing Montana standard and almost half of the federal guideline.

RESPONSE: The board acknowledges the comment. The department has not departed from the process, and this particular standard setting process has included more public meetings and more stakeholder and external expertise collaboration than any process the department has undertaken. Beginning with data collection and public outreach in 2015, this has included seven large format panel discussion public meetings held in northwest Montana, as well as smaller format meetings with local officials in the area. The forum utilized for this transboundary effort was the LKMRWG, a group that has met twice a year since 2015. Selenium, in particular development of the appropriate water quality standard, was determined to be the first priority. Thus, a Se Technical Subcommittee (SeTSC) was formed comprised of top experts in selenium, meeting nearly 30 times to guide data collection, modeling work, and standard development. See also, response to COMMENT NOs. 19 and 23.

COMMENT NO. 13: The standard unnecessarily deviates from U.S. EPA's current national criteria guidance (2016) and is lower than any other state-wide or site-specific standards in the U.S.

RESPONSE: The board does not agree with the comment. The department followed protocols defined in Appendix K (EPA, 2016) which details the steps required to develop site-specific selenium criteria. The data required to undergo a site-specific derivation effort is extensive. In this case, it took a minimum of four years of data collection. The EPA 304(a) guidance document was finalized in 2016, only four years ago. Many states and tribes do not yet have the extensive data required to develop site-specific criteria required to utilize the Ecosystem-Scale model.

In 2016, the department was participating in a bi-national working group addressing selenium as a result of Ministerial Order (No. M113) under the British Columbia Environmental Management Act to remediate water quality effects of past mining activities and to guide environmental management of future mining activities in the Elk Valley, including the Canadian portion of Lake Koocanusa. The data collection efforts of BC and MT began in 2015 making Montana among the first states or tribes to undertake derivation of site-specific selenium criteria. In the San Francisco Bay Delta, years of selenium data had already been collected, allowing EPA to use the Ecosystem-Scale model (Presser and Luoma, 2010). On November 29, 2018, EPA signed a proposed rule to revise the current federal CWA selenium water quality criterion applicable to certain fresh waters of California. This rule, Establishment of a Numeric Criterion for Selenium for the State of California, is being proposed to ensure that the criterion is set at a level that protects aquatic life and aquatic-dependent wildlife, and includes 0.2 µg/L dissolved selenium for San

Francisco Bay.

COMMENT NO. 14: The selection of a number of 0.8 µg/L has the potential to set precedent in other areas of the region.

RESPONSE: The board does not agree with the comment. The data used to derive the 0.8 µg/L is site-specific and would not be applicable to other waterbodies.

COMMENT NO. 15: The following comment consists of counterpoints to the comment stated during the public hearing (paraphrased) as follows: The standard will set precedents in other regions of the US imposing hardship on other states and mining prospects.

Counterpoint: The proposed criteria is "site-specific," which means: "site-specific." Valid site-specific processes in other parts of the US should result in unique, site-specific standards for those regions.

RESPONSE: The board agrees with the comment.

COMMENT NO. 16: The complex, collaborative process has been thorough and transparent with ample public involvement.

RESPONSE: The board acknowledges the comment. The department worked to facilitate a transparent, collaborative process with numerous opportunities for public involvement. The department co-led the Lake Koocanusa Monitoring and Research Working Group (LKMRWG) which had a broad range of engaged members. The department co-managed a public website housing all materials associated with the selenium work including but not limited to: data, meeting summaries and presentations, sampling and analysis plans, technical reports, and literature. The department held numerous public meetings on the standard development and data collection efforts in Lake Koocanusa beginning in 2015, and this rulemaking effort met all requirements of the Montana Administrative Procedure Act (MAPA), 2-4-301, MCA *et seq*.; the Montana Water Quality Act (WQA), 75-5-307, MCA; and the federal Clean Water Act.

COMMENT NO. 17: We commend the department for collaborating with multiple stakeholders in Montana and British Columbia for over five years to develop a site-specific selenium water column element for Lake Koocanusa with the mechanistic model approach recommended by EPA.

RESPONSE: The board acknowledges the comment. The department worked collaboratively with British Columbia and multiple stakeholders while following EPA 304(a) guidance (EPA, 2016) for developing a site-specific standard for selenium utilizing the EPA recommended mechanistic model approach.

COMMENT NO. 18: We applaud the formation and work of the LKMRWG. Efforts of this multi-agency collaboration have produced datasets that indicate a need for on-going downstream monitoring.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 19: There has been a short stakeholder outreach process. I think some of the department's most successful efforts in the past have taken a long

time because they have had a robust stakeholder participation, which we do not see in this case.

RESPONSE: The board disagrees with the assertion that there has been a short stakeholder process. The department has held public meetings (a total of seven) on the proposed Lake Koocanusa and Kootenai River selenium standards since 2015. Just in the past year these have included two public meetings in Libby and Eureka in 2019, additional meetings with local officials in 2019 and 2020, and two virtual public meetings in 2020. These public meetings were in addition to engaged participation with a multi-stakeholder working group and maintaining an extensive co-managed public website housing all data, meeting summaries, sampling and analysis plans, technical reports, and literature. See response to COMMENT NO.12.

COMMENT NO. 20: The proposed standards for fish tissue and water quality are derived from an unprecedented and multi-year analysis that involved, among many others, the British Columbia Ministry of Environment and Climate Change Strategy, US Geological Survey, the US Environmental Protection Agency, the Montana Department of Environmental Quality, Montana Fish, Wildlife and Parks, US Fish and Wildlife Service, multiple Tribal and First Nations agencies, and university scientists and researchers. The six-year timeline for this process was agreed to by all parties at the outset, and remains on schedule for completion by close of 2020. Additionally, this robust and transparent scientific analysis conducted by the world's leading selenium experts, the Lake Koocanusa Monitoring and Research Group, and the Selenium Technical Committee (SeTSC) has resulted in sound and peer reviewed findings that at every step have been published and shared in the public domain.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 21: A number of commenters requested the board to not delay in the adoption of the proposed selenium limits. The commenters stated that the water quality and fish cannot afford to wait any longer.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 22: The scientific effort that has resulted in the proposed standards began five years ago, and DEQ proposed then to complete the standard-setting process by the end of 2020. We commend DEQ for reaching that milestone.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 23: A number of commenters expressed the need to stop and slow down this process to do more work.

RESPONSE: The board disagrees with the comment. The LKMRWG has achieved the critical milestones in the scientific process undertaken to establish site-specific selenium standards for Lake Koocanusa. The department has adhered to rulemaking requirements in the Montana Administrative Procedure Act; and to the process for adopting a water quality standard under both the Montana Water Quality Act and the federal Clean Water Act. See response to COMMENT NO. 16.

COMMENT NO. 24: The timing of this rulemaking is particularly bad – the world is in the midst of a pandemic that severely challenges many individual's work performance for a variety of reasons and prevents the face to face meetings that would normally be held by the Committee and Subcommittee to enable consensus building dialogue.

RESPONSE: The board acknowledges the hardship of many during the Covid-19 pandemic. The department agrees that an in-person SeTSC meeting would have been preferable. However, the department viewed the half-day ZOOM teleconference (August 25, 2020) as a major success with 100 percent attendance, robust discussions, and recommendations from all SeTSC members provided. Those positive sentiments were also expressed by participating members.

COMMENT NO. 25: We oppose this rule in the current form. Rather, we ask that you give the experts more time to study the rule and the data, and give the selenium experts, stakeholders, and legislators more time to review options.

RESPONSE: The board acknowledges the comment. See response to COMMENT NO. 23.

COMMENT NO. 26: The majority of WPIC members support a six-month pause in setting this standard to allow for data such as the water treatment data to be investigated and used to set the standard.

RESPONSE: The board notes that WPIC did not lodge either a formal or informal objection to the proposed selenium standards for Lake Koocanusa and the Kootenai River under 2-3-305(9) or 2-4-406(1), MCA. Water treatment information cannot be taken into account in establishing water quality standards under the Clean Water Act. However, treatment technology and economic cost of treatment are considered in the formulation and adoption of standards under the WQA. 75-5-301(2), MCA. In this case, there are no public or private entities discharging to the Kootenai River or Lake Koocanusa with Montana Pollutant Discharge Elimination System (MPDES) permit effluent limits for selenium. Therefore, no permittee will be immediately required to incur additional costs to treat wastewater for selenium. Selenium enters surface water from natural sources. Larger land development activities, such as surface mining and construction are already subject to general discharge permit requirements including implementation and maintenance of best management practices (BMPs). The department foresees no additional treatment requirements associated with these land disturbing activities due to the adoption of site specific selenium criteria. Available treatment technology and economic cost of treatment can play a role in use attainability determinations and in variance development. The department has been and will continue to investigate water treatment data and use it to help guide its work to implement and enforce the selenium standards.

COMMENT NO. 27: The only thing I see is the political rush to set the selenium standards so low, as to force Lake Koocanusa out of compliance of current water quality standards. If there is no "crisis" then setting the standard to the proposed levels will only create an unattainable standard.

RESPONSE: The board disagrees with the comment. Water quality

standards are established based on sound scientific rationale reflecting the latest scientific knowledge on the effects of the concentration and dispersal of pollutants on the aquatic species, or human health. See also, response to COMMENT NO. 149.

COMMENT NO. 28: Why was this proposed very low standard first announced at a virtual meeting in September when there was no reasonable time to question, comment, or petition for change because it immediately went to WPCAC and then immediately to BER?

RESPONSE: Following completion of several milestones in the development of the proposed site-specific selenium standard for Lake Koocanusa (which included five years of data collection, a peer-reviewed modeling report, recommendations from the Selenium Technical Subcommittee (SeTSC), and BC/MT co-developed supplemental model scenarios), the department hosted two public meetings in September 2020 to explain the science and take questions. These meetings were held virtually via ZOOM, due to the Covid-19 pandemic. In parallel, and following the Montana Administrative Procedure Act, the department on September 11, 2020 presented the proposed standard to the Water Pollution Control Advisory Council who unanimously voted to move the rule forward to the Board of Environmental Review (BER) on September 24, 2020. This rulemaking effort met all requirements of MAPA, 2-4-301, MCA *et seq*.; the WQA, 75-5-307, MCA; and the federal Clean Water Act. See response to COMMENT NO. 16.

COMMENT NO. 29: We have always known the department to be very accommodating to the Montana Legislature, but in this case, the Legislature's Water Policy Interim Committee had to request the information from the department. After receiving and considering the information, half of the WPIC members were concerned enough that they voted to object to the rulemaking. The local legislators and county commissioners from Lincoln County have consistently asked for more time in this process. These are clear indications that the rule is too rushed.

RESPONSE: The department is always happy to provide the Montana Legislature with any information they request. The department has briefed the Environmental Quality Council (EQC) about the selenium pollution in Lake Koocanusa in the past. Most recently, the department briefed EQC about this selenium rulemaking process and timeline for public comment and approval at the Council's September 25-26, 2019, meeting. The department is currently following the same timeline it presented to EQC over one year ago. Additionally, the department worked with local stakeholders, state, federal, and Canadian agencies, and selenium experts on the selenium rulemaking process for over six years.

As noted by the commenter, the department briefed the Water Policy Interim Committee (WPIC) on October 13, 2020, providing a summary of the proposed selenium rule and an update on the rulemaking process and schedule. WPIC then discussed the selenium proposal, heard comment from the public, entertained a motion to lodge an informal objection to the proposed rule, held discussion on the motion, and voted not to object to the proposed selenium standards.

COMMENT NO. 30: The following comment consists of counterpoints to the

comment stated during the public hearing (paraphrased) as follows: more time is needed because more data is needed to establish a scientifically rigorous selenium standard.

Counterpoints include: DEQ criteria are based on six years of transboundary collaborative scientific studies, led by agencies in BC and MT, that was preceded by five years of data collection before the collaborative process. MT, BC, FWP, DEQ, Tribes, KNC, EPA, USFWS and USGS agreed that selenium is impacting Lake Koocanusa and needs to be regulated. Only Teck benefits from more time dedicated to this process. Montanans and Idahoans lose as pollution continues to flow and increase in Lake Koocanusa and the Kootenai River below Libby Dam. Only Teck is affected by the standard. Teck has touted its active water treatment and Saturated Rock Fill water treatment. If these technologies are efficacious then Teck should not be concerned with MT setting a Se standard at this time. It is easy to call for more study, but the evidence before us now makes it clear that there is enough data to take action.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 31: The following comment consists of counterpoints to the comment stated during the public hearing (paraphrased) as follows: The process has been rushed and has not given local elected officials enough time to understand the science.

Counterpoints include: On Day 1, November 2014, in Eureka, Montana, the collaborative stakeholders of the Lake Koocanusa Monitoring and Research Subcommittee collectively agreed to set site-specific criteria for selenium by the end of 2020. Montana DEQ has met the timeline agreed by all at the outset. It is understandable that local elected officials may not understand the science. However, it is not necessary for them to understand, as they are not scientists. This is precisely why Montana and other states have departments of environmental quality, in order to conduct the science and recommend the most appropriate standards for controlling pollution. DEQ has provided multiple sessions explaining the six-year process, the data collected, and the methods of deriving the criteria. These sessions have been available for elected officials and the public. If elected officials still do not understand the science, then there is little hope that they ever will. This is not a legitimate reason to delay or halt setting revised criteria for Lake Koocanusa or the Kootenai River below Libby Dam.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 32: Why was the normal Montana legislative process sidestepped until pushed by the conservative legislators of the area that prompted the purview of WPIC and when it was brought to WPIC, a split partisan vote of the members, WPIC can not be considered consensus.

RESPONSE: This rulemaking effort met all requirements of MAPA, 2-4-301, MCA *et seq*.; the WQA, 75-5-307, MCA; and the federal Clean Water Act. See response to COMMENT NOs. 16 and 28.

The department also presented information on the standard setting process and timeline to both the Environmental Quality Council and the Water Policy Interim Committee (WPIC) upon their request. See response to COMMENT NO. 29.

WPIC is the designated administrative rule review committee "where the primary concern is the quality or quantity of water." 5-5-231, MCA. WPIC has authority to lodge an objection to the department-proposed selenium standards. An objection under MAPA must be made by a majority of the WPIC members. 2-4-305(9), MCA. At its October 13, 2020 meeting, WPIC did not have a majority in support of lodging an objection to the proposed selenium standards. See Response to COMMENT NO. 28.

COMMENT NO. 33: I do not see what the immediate crisis is. I do not see why misleading information has been put out there.

RESPONSE: In accordance with 40 CFR §131.11(a)(1), states must adopt water quality criteria that protect the designated use. Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. The proposed selenium water quality standards are intended to protect the aquatic life beneficial use. The current selenium standard for Lake Koocanusa and the Kootenai River is 5 µg/L and is based on 1987 EPA guidance. The results of the bioaccumulation modeling work presented in Presser and Naftz (2020) clearly show 5 µg/L is not protective of the aquatic life beneficial use for Lake Koocanusa. See also, COMMENT NOs. 145 and 149.

COMMENT NO. 34: I have concerns based on incorrect information and misleading suggestions presented in meetings, particularly the WPIC hearing, which may have influenced some members to vote no on the proposal for additional time to understand it. I think some DEQ officials may not fully understand things.

RESPONSE: Thank you for the comment and the opportunity to provide additional information. The board has provided additional information and clarification in response to specific comments. See response to COMMENT NOs. 151 and 153 through 155.

COMMENT NO. 35: As you know, the Water Policy Interim Committee (WPIC) is the designated administrative rule review committee for issues that concern water quality. In this capacity, we appreciate when the Department of Environmental Quality (DEQ) provides timely information to us on upcoming water quality standard rulemaking efforts, such as the updates DEQ provided regarding nutrient and arsenic rulemaking at our July 13-14, 2020 meeting. Curiously absent from those updates was information regarding the above-referenced selenium rulemaking for Lake Koocanusa and the Kootenai River. Additionally, no information on the selenium rulemaking was presented to WPIC during our September 14-15, 2020 meeting even though information had been presented at earlier board meetings and even though the draft rule had been released to the public prior to our meeting.

RESPONSE: See response to COMMENT NO. 29. The board stresses that the department is always willing to provide updates or briefs to WPIC or other Legislative committees on any topic. The department briefed WPIC on five different topics during the July 13-14, 2020, and September 14-15, 2020, committee meetings. Neither selenium nor general water quality standards development were on the agenda for those meetings. The department did answer questions about

selenium rulemaking when they were raised by WPIC committee members during the September 2020 meeting and briefed the Committee on selenium rulemaking when requested by WPIC at the Committee's October 13, 2020 meeting. The Environmental Quality Council (EQC) requested that the department brief the council on selenium standards during their September 25-26, 2019, meeting. The department also answered EQC's questions about selenium rulemaking during their September 9-10, 2020, meeting. The department plans to request time on WPIC agendas in the future to brief the Committee on all water quality standards rulemaking at least once a year.

COMMENT NO. 36: It is unclear how the board will be able to meaningfully consider the testimony from the public hearing as well as the public comments in the limited timeframe – about two weeks – before there is a vote on the proposal.

RESPONSE: The board and department will work within the timelines to thoroughly address all oral and written comments on the proposed rules and meet all requirements under MAPA, the WQA, and the federal Clean Water Act.

COMMENT NO. 37: Nobody at DEQ or any other Montana agency is willing to stand up and say remove Article 13 from CRT because it would be a disaster for ecosystems of both drainages. DEQ and Teck Coal should band together to eliminate Article 13 from CRT because the full diversion would take away 26 percent of the annual Kootenai freshwater flow into Lake Koocanusa, and what would that do to selenium concentration?

RESPONSE: The board acknowledges the comment, but notes that articles within the Columbia River Treaty are outside the scope of this rulemaking.

COMMENT NO. 38: This rulemaking is inconsistent with previous rulemakings. The reason given by DEQ was that they wanted to finish the rulemaking before the change in administration at the end of the year. DEQ's statements indicate that this rulemaking is not aligned with normal, expected and required scientific and technical motivations. Contrary to previous water quality standard rulemakings, this proposed rule was not discussed with the Montana Legislature's Water Policy Interim Committee in a timely fashion. But again, in a significant departure from established procedures, DEQ did not present information to WPIC prior to rulemaking initiation. Instead, WPIC had to request information from DEQ, hold a special meeting, and receive the information after the rule had already been initiated. The WPIC members were concerned enough that half of them voted to invoke statutory rule review authority to ensure that additional time was provided for rulemaking. This indicates that the state's policy makers are hesitant to support this rushed rulemaking.

RESPONSE: See response to COMMENT NOs. 29, 32, and 35.

COMMENT NO. 39: The state of Montana has not updated their selenium standard and still relies on the EPA's 1999 criteria. The state should update their statewide standard to reflect the EPA's updated 2016 criteria before it moves forward to set a substantially lower standard for a single waterbody, particularly one that is not selenium-impaired.

RESPONSE: The department is in the process of gathering data at a state-wide level to determine the implications of state-wide adoption of EPA's 2016 304a selenium criteria. This will be accomplished through the department triennial review of the state's water quality standards. The department's ongoing state-wide work should not preclude adoption of site-specific selenium criterion for Lake Koocanusa where work to develop site-specific criteria has been going on for many years.

COMMENT NO. 40: Given the pre-existing bilateral Selenium Technical Subcommittee (SeSTC) that was underway prior to Montana initiating the rulemaking process, the development of a management approach should fully enable, consider, and address input from the various expert and stakeholder members of the SeSTC. This would likely produce a selenium management strategy for Lake Koocanusa that is technically sound, scientifically defensible, and consistent with good regulatory policy.

RESPONSE: The Selenium Technical Subcommittee was formed to provide information and analysis for the development of selenium criteria/objectives for Lake Koocanusa that are protective of the uses of the lake including, but not limited to, aquatic life, human health, recreation, wildlife, and agriculture, with the specific goal of answering the questions: Is the current Canadian selenium target of 2 µg/L, as set out in the BC Water Quality Guideline, protective of the uses in Lake Koocanusa? If not, what is an appropriate target value for selenium in Lake Koocanusa?

The collaboration and expertise of the SeTSC members was utilized to accomplish these objectives and the department looks forward to continued trans-boundary coordination on future topics pertaining to Lake Koocanusa.

COMMENT NO. 41: The Kootenai River is of immense importance to local communities as a source of pride and an economic driver. Thanks to Montana's efforts to maintain clean waters, the Kootenai River brings out of state tourism. The proposed standards would ensure healthy fish populations. This is important for tourism and recreation associated with fishing on the Kootenai River which plays an important role in Lincoln County's economy and creates direct and indirect jobs for Montana residents.

RESPONSE: The board acknowledges these comments. The proposed standards are established for the protection of aquatic life in Lake Koocanusa and the Kootenai River.

COMMENT NO. 42: I have seen the regions of the west transform. Extractive industries have overall declined, and the major area of growth is in outdoor recreation. Fishing, hunting, boating, hiking, and many other activities are a growing part of the economy in North Idaho. Protecting and supporting a thriving ecosystem benefits all of us, and with the clearly detrimental effects of selenium, it seems clear that we must advocate to limit selenium pollution in our region.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 43: The geology is unique, and the impacts are limited to Canadian mine operators. There are no known selenium deposits in the Montana

geology of this watershed. There are no operating or proposed mines on the Montana side of this watershed. There are no known selenium sources at any existing or proposed mine anywhere in this region of Montana or Idaho. In other words, there is no known potential for negative impact to Montana industries or economies of adopting these proposed standards for selenium contamination. In fact, Montana's only liability lies in not immediately adopting the MDEQ proposed standards.

RESPONSE: The board acknowledges the comments. See also, response to COMMENT NO. 129.

COMMENT NO. 44: The following comment consists of counterpoints to the comment stated during the public hearing (paraphrased) as follows: The proposed criteria will impact the opportunity for Lincoln County to develop mines in its landscape.

Counterpoints include: The geology of NW Montana is not the same as that found in the Elk River Valley, the source of the selenium. The geology in NW Montana will not produce selenium pollution as a by-product of mining. DEQ reviewed all mining potential in the Kootenai watershed and determined that they would not be impacted by the proposed criteria.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 45: We are writing in opposition to the proposed draft rule because of technical and process concerns, as well as concerns about unintended consequences that may negatively affect Montana's economy and communities.

RESPONSE: This rulemaking effort met all requirements of MAPA, 2-4-301, MCA *et seq*.; the WQA, 75-5-307, MCA; and the federal Clean Water Act. The development of the proposed site-specific selenium standard for Lake Koocanusa included five years of data collection, a peer-reviewed modeling report, recommendations from the SeTSC, and development of supplemental modeling scenarios by BC and Montana. Additionally, the department hosted two public meetings in September 2020 to explain the science and take questions. See response to COMMENT NOs. 16 and 28. There are no public or private entities discharging to the Kootenai River or Lake Koocanusa with MPDES permit effluent limits for selenium. Larger land development activities, such as surface mining and construction are subject to general discharge permit requirements including implementation of BMPs and the department foresees no additional treatment requirements for these activities due to the adoption of site-specific selenium criteria. See response to COMMENT NO. 26. There are no known negative economic impacts associated with this rulemaking.

COMMENT NO. 46: We are concerned about the lack of evidence to justify the proposed rule, the process by which the proposed rule was initiated, and the unintended consequences that may negatively affect Montana's economy and communities. Neither the fish tissue or water column data show any evidence that support the dramatic change in water quality standards being proposed.

RESPONSE: The board disagrees with the comment. See response to COMMENT NOs. 45, 145, 160, and 177.

COMMENT NO. 47: DEQ stated, there would be no economic impacts to the surrounding area. If they've done an economic impact study, where is that study? The final rule must include information regarding the costs of the regulated community, yet no such information was provided with the proposed rule so that the regulated community could review and offer comments on the information.

RESPONSE: Following 2-4-111, MCA, prior to the adoption of a proposed rule, an agency must determine if the rule will have significant and direct impacts on small businesses. The department has completed this *Small Business Impact Analysis (October 2020).* This analysis is included in the rulemaking package and is available upon request. Under 2-4-102(13), MCA, a small business is a business entity, including its affiliates, that is independently owned and operated and that employs fewer than 50 full-time employees.

The department's analysis also looked at the cost of wastewater treatment that may be passed on to small businesses. While there are multiple communities with public wastewater treatment systems in the watershed, none discharge selenium, and so would not be required to treat for selenium.

Regarding large businesses, the only large mine in the watershed on the US side of the border is the Montanore Mine. In the most recent permit renewal application for the mine, Montanore Minerals Corporation stated that they do not believe selenium is present at the mine.

COMMENT NO. 48: Statements were made that there would be no negative economic impact on Lincoln County if the standard of .8 micrograms per liter is adopted. However, if the average amount of selenium concentration in Lake Koocanusa is about 1.0 micrograms per liter, it appears that immediately Lake Koocanusa would be listed as an "impaired water body." First, I have serious concern that "scare headlines" about a polluted lake will be detrimental to real estate, recreational home construction, and recreational businesses in the Tobacco Valley and the Libby area. From my experience, many commercial projects are slowed, delayed, stopped, or made more expensive from lawsuits and/or appeals, based on environmental considerations. I believe that the status of "impaired water body by selenium content" will add another road block for mining, logging, gravel pits, roads and bridges, subdivisions, perhaps others. That means unnecessary negative economic impact.

RESPONSE: Lake Koocanusa was listed as an impaired waterbody due to other causes prior to 2012. The department originally listed selenium as a threat to aquatic life use in Lake Koocanusa in 2012. Lake Koocanusa is currently listed as threatened for selenium (2018 Integrated Report). The source of the selenium is believed to be mining activity in the Elk River Valley. There is no evidence that real estate values have been or will be impacted by threatened or impaired status of Lake Koocanusa. Additionally, there is no evidence that local mining or other land disturbing activities would be negatively impacted by a change in the impairment status. Lake Koocanusa's beneficial use assessment record can be accessed via a search on Montana's Clean Water Act Information Center (http://svc.mt.gov/deq/dst/#/app/cwaic). See response to COMMENT NOs. 26, 47, 50, 51, and 131.

COMMENT NO. 49: There is no threat to Montana jobs (the mining company is in Canada), and having an enforceable limit that protects public health would allow for taking action, with the ability to claim compensation, against violators if standards are broken.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 50: We are concerned that if Lake Koocanusa is labeled impaired status, follow-up regulatory actions will only prevent future development and industry within Lincoln County. Projects going forward will most likely have to spend millions of dollars and could even take decades to prove no degradation before being approved to proceed. The hurrying through of this low standard will undoubtedly have a negative effect on the residents and economics of Lincoln County. What regulations will be implemented on future developments and industry in Lincoln County to measure their contribution to selenium in Lake Koocanusa and the Kootenai River? Will future projects and development have to prove they will not contribute selenium to the Kootenai River drainage or Lake Koocanusa?

RESPONSE: If Lake Koocanusa were found to be impaired for selenium as a result of the adoption of the proposed selenium standard (0.8 µg/L), as the comment posits, then new projects would need to discharge at concentrations equal to or less than the proposed standard of 0.8 µg/L. But if the lake is not found to be impaired for selenium, nondegradation rules would apply as follows: a new or increased source of selenium would not be considered significant (and not be subject to further nondegradation review) if the resulting concentration outside of a mixing zone designated by the department does not exceed 15 percent of the standard; see ARM 17.30.715(1)(c). This nonsignificance threshold is equal to 0.12 µg/L for the lake (and 0.47 µg/L for the river, where the proposed standard is 3.1 µg/L). Limited selenium data from tributaries in the watershed using very low detection limits all show concentrations to be ≤0.08 µg/L, concentrations that would not be considered significant per the state's nondegradation regulations. Dozens of other samples in the watershed with detection limits near 1 µg/L are all non-detects as well. The totality of data indicate selenium is at very low concentrations in the watershed; thus, the board has no compelling information indicating that future development and industry in Lincoln County would be subject to the cost and delays described in the comment and as a result of this rulemaking. See also, response to COMMENT NOs. 9, 43, 47, 48, and 53.

COMMENT NO. 51: There has been no consideration of the economics of waste treatment and prevention, as required when adopting water quality standards. 75-5-301(2), MCA.

RESPONSE: Available treatment technology and economic cost of treatment are considered in the formulation and adoption of standards under the WQA. 75-5-301(2), MCA. The department found no public or private entities discharging to the Kootenai River or Lake Koocanusa with Montana Pollutant Discharge Elimination System (MPDES) permit effluent limits for selenium. It is likely that best management practices (BMPs) will be necessary to avoid impact to water quality from land disturbing activities in the local watershed such as mining and

construction. These operations are already subject to BMPs to avoid impacts to surface water and should not incur substantially different treatment costs as a result of this rulemaking. There is no evidence to suggest adoption of the selenium standards will result in increased treatment costs for owners and operators of activities or facilities that discharge to surface water. Data from the Lake Koocanusa/Kootenai River watershed indicates that selenium is very low, below the proposed standards, and all available data indicate watershed concentrations are very likely to be below the nondegradation nonsignificance thresholds as well. See also, response to COMMENT NOs. 26, 43, 50, and 129.

COMMENT NO. 52: We need to stop and see what the effect is going to be on our industries, our communities, our business, and our people. The stakeholders need time to understand the implementation.

RESPONSE: The department carried out, as required by statute, both a takings and a small-business impact analysis. Presently, there are no anticipated effects on Montana industries, communities, or people in the Lake Koocanusa/Kootenai River watershed. Selenium discharge concentrations are regulated via MPDES discharge permits, and there are two communities (Libby and Troy) who have discharges to the Kootenai River where the new Se standard (3.1 µg/L) would apply. Neither of these communities currently has a selenium limit in their discharge permit, and the department's analysis indicates that there is no reason to expect there will be a selenium limit in their permits. See also, response to COMMENT NO. 50.

COMMENT NO. 53: One critical piece that is missing is an assessment method for fish tissue standards. The department is required to assess water and waterbodies for compliance with the standards and for fish tissue standards there is no assessment method in Montana that has been publicly reviewed and vetted and adopted by the department.

RESPONSE: The board agrees that an assessment method specific to fish tissue standards is important. While a publicly reviewed assessment method is not a required component in adoption of a water quality standard, 40 CFR 130.7(b)(6)(i) requires states to submit "a description of the methodology used to develop an impaired waterbody list." The department will undertake this effort beginning in 2021 and will do so in collaboration with the state of Idaho, federal partners, and stakeholders. As a basis for this forthcoming assessment method, the department will utilize our 2016 Standard Operating Procedure (SOP) for fish tissue analysis developed in anticipation of the continuing need for accurate data representing the levels of selenium found in fish species in Montana. The SOP is intended to serve as a guide for and to ensure integrity and consistency in the collection of fish tissue samples from fish populations in Montana waters and has been and will continue to be a reference in development of project planning and design documents. See also, response to COMMENT NOs. 73 and 189.

COMMENT NO. 54: Montana has no publicly reviewed and/or DEQ adopted assessment methodology for assessing waterbodies based on fish tissue data. DEQ has proclaimed that there are issues with aquatic life in the lake, but there is no

assessment method by which DEQ can properly and consistently make the determination. An assessment methodology must be prepared, publicly reviewed, and adopted by DEQ before any conclusion about harm based on fish tissue data can be made and before a rule can be proposed or initiated for fish tissue.

RESPONSE: See response to COMMENT NO. 53.

COMMENT NO. 55: We would strongly recommend that consideration is given to a continuous water quality monitoring regime for the presence of selenium that will provide alerts immediately if there is an increase in selenium levels and inform mitigatory actions before environmental damage is done. Such "canary-in-the mine" technology would be far better than using biosensors (dead fish) to alert stakeholders to a problem.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 56: Training would be needed for compliance. Water quality compliance currently is based on water sampling. Collecting samples for such low-level analyses requires specialized methods. Also, when, where, and how to catch fish for tissue analysis (which should be the matrix upon which a declaration of "impairment" is made) and how to composite fish for analysis will require additional guidance and training. A well-defined assessment method would need to be established as the proposed standard.

RESPONSE: The department works with trained crews for water quality sampling and expects to work with trained fish sampling crews for future fish tissue sampling. See also, response to COMMENT NOs. 53 and 58.

COMMENT NO. 57: The drafting process for the proposed rule has been rushed. A rule this complex, without clear scientific agreement, requires more time for research and collaboration. This specific rule, written in terms of water column requirements and fish tissue criteria, is a brand-new concept in Montana and we do not understand it well enough. For example, the draft rule does not cover how enforcement will occur if fish samples exceed the standard. Is one fish sample enough to support enforcement or regulatory action or will that require multiple fish samples over a period of time? The rule also does not mention how the lake and river will be assessed, or how often. Additionally, the rule does not indicate what fish species will be used, and whether the requirements are the same for all species.

RESPONSE: The board disagrees that the process has been rushed but agrees that a method for the assessment of fish tissue is important. See response to COMMENT NOs. 53 and 73. In addition, clarification for the frequency component of the fish tissue standard will be provided in rule. See response to COMMENT NO. 189.

COMMENT NO. 58: Montana would have a regulatory standard below the ability of most Montana laboratories to actually measure it.

RESPONSE: The department reviewed the method of detection (MDL) and reporting limit (RL) for analytical labs commonly used by the department; a laboratory routinely used by the department can achieve an RL below the proposed standard of 0.8 µg/L. See also, response to COMMENT NO. 59.

COMMENT NO. 59: The standard is less than one tenth the current Practical Quantitation Limit (PQL)6 of 10 µg/L, determined by EPA (2009) (see Gilron and Downie, 2016) and near the Method Detection Limits (MDLs) of EPA-approved methods for Se; There is increased variability/measurement uncertainty as measurements approach a laboratory's MDL; and establishing a standard near the MDL of available methods will lead to uncertain or inaccurate compliance determinations. To minimize uncertainty in the determined sample concentration and the risks of either false compliance or non-compliance, the achieved quantitation limit should be significantly lower than the regulatory limit (i.e., best practice is typically for the quantitation limit to be no more than one fifth of the regulatory standard). Standard would require a quantitation limit of 0.16 µg/L Se. This will be very difficult for most laboratories to achieve.

RESPONSE: The most common reporting limit over the past 17 years for the dataset from the Lake Koocanusa watershed has been 1 µg/L; this level has been routinely reported by laboratories (state and private) in Montana. (It should be noted that reporting limits are commonly set at a concentration 3-5 times higher than the method detection limit.) In the past two years, the USGS has been collecting samples whose reporting limit is most commonly 0.081 µg/L, a level provided by Brooks Applied Labs in Washington state. Recently, the department received updated selenium reporting limits from commercial laboratories who routinely do work for the state; their reporting limits were 0.5 to 1 µg/L. Current reporting limits from commercial laboratories, therefore, can now be achieved at concentrations below the proposed standards.

COMMENT NO. 60: The following comment consists of counterpoints to the comment stated during the public hearing (paraphrased) as follows: Commercial laboratories cannot measure 0.8 ppb of selenium.

Counterpoints include: Many samples are tested from Lake Koocanusa every year down to a reliable detection limit of 0.05 ppb. Teck tests thousands of these samples annually. Inductively coupled plasma mass spectrometry is commonly used to measure many elements in water, including selenium, and is widely available from commercial environmental laboratories.

RESPONSE: The board agrees with the comment.

COMMENT NO. 61: There is no clear pathway to ensure the lake achieves the proposed standard. The proposed rule is incomplete because it does not consider how compliance will be achieved.

RESPONSE: Water quality standards are established for the protection of the beneficial use. Reductions in the source of the pollutant are determined via the development of a Total Maximum Daily Load (TMDL) which allocates the necessary source reductions to achieve the underlying standard. Compliance is typically achieved through multiple programs that use the water quality standard as the basis for implementing their water quality protection responsibilities such as effluent limits in permits or best management practices. This includes the development of a TMDL that provides a road map for achieving compliance with the standard by allocating the necessary source reductions among the pollutant sources. The department will

work with BC as well as EPA and the State Department to ensure that steps are taken to address an impairment of the proposed standard. This could include the establishment of a waste load allocation at the border which BC would be responsible for meeting or other mechanisms to ensure that the standard is attained.

COMMENT NO. 62: Although the department indicated that the proposed standard may be used in the context of an international treaty with Canada, that seems ill-considered and fraught with complications, particularly when local legislators and county commissioners are expressing serious concerns about the rule. We should not allow Montana water quality standards, which should be scientifically driven and achievable, to be used as leverage for international conflict. In the meantime, Montana will have yet another standard set below the existing levels, and that is likely unachievable and cost prohibitive. Indeed, if Teck has invested millions of dollars in treatment at its operations in the Elk Valley, as noted during the public hearing, and the proposed standard is still not achievable, it is doubtful that the regulated community, especially any start-up industry in Montana, could afford treatment necessary to meet the standard.

RESPONSE: The board notes that water quality standards must be scientifically driven and based upon a demonstration of sound science in the protection of the beneficial use. Available treatment technology and economic cost of treatment are also considered in the formulation and adoption of standards under the WQA. 75-5-301(2), MCA. See response to COMMENT NO. 51. The US and Canada have operated under the Boundary Waters Treaty since 1909, which requires that neither country shall cause water pollution that will cause injury to health or property in the other country. Adoption of the selenium standards for Lake Koocanusa and the Kootenai River will not change this obligation.

COMMENT NO. 63: The 2012 DEQ listing of Lake Koocanusa threatened for selenium was wrong and estimated that the lake would exceed the current water quality standard of 5.0 µg/L by 2015. That never happened. That listing is wrong, and therefore should not serve as the basis for setting a stricter standard. There is no document indicating the lake does or will exceed the standard.

RESPONSE: The threatened listing was not the impetus for the derivation of a site-specific standard. The department began the collaborative work with BC-ENV and the bi-national LKMRWG to develop a protective water column standard to protect aquatic life in Lake Koocanusa, an effort determined necessary based on the local environmental factors affecting selenium bioaccumulation. The 2012 determination that Lake Koocanusa was threatened for selenium was based on the best available information and science. The analysis used knowledge about current and future loading and full mixing within the reservoir. At the time of the initial threatened listing, there were no active treatment plants or other treatment technologies in operation in the Elk Valley, British Columbia, thus, the determination incorporated conservative assumptions (i.e., no treatment). See response to COMMENT NOs. 48 and 66. In re-assessing Lake Koocanusa's impairment status for selenium, the department was waiting upon results of the site-specific standard effort. If adopted, the selenium criteria will be used to reassess the impairment status of Lake Koocanusa.

COMMENT NO. 64: There is no valid basis for this rulemaking. There is no threat to Lake Koocanusa that warrants this rulemaking. Neither the public notice of the proposed rule nor the derivation document clearly or thoroughly demonstrates any reasonable necessity for the proposed rule. DEQ's 2012 assessment of the lake has been proven wrong over time and DEQ presents no water quality data or fish tissue data that warrant the rulemaking.

RESPONSE: See response to COMMENT NOs. 13, 63 and 200.

COMMENT NO. 65: The water quality assessment for the lake has not been updated since 2012. In the 2012 assessment, DEQ estimated that the lake would exceed selenium standards by 2015 – which has NOT happened, even today in 2020. DEQ has told us in public meetings that the lake levels range between 0.04 - 2.29 µg/L selenium, with a current average of 1 µg/L selenium. DEQ has shown us graphs of lake data from 2013 – 2019 showing no increase in selenium in the lake. The data shows that the selenium levels have been and remain well below the standard of 5 µg/L selenium. That is NOT an impairment and it does NOT indicate any threat of an impairment. The water treatment data has been overlooked and ignored. The levels of selenium have even leveled out since the start of selenium and nitrates being removed from the water entering the Elk River.

RESPONSE: See response to COMMENT NOs. 62 and 63.

COMMENT NO. 66: What data and standard will be necessary to deem the lake "unimpaired" once deemed "impaired" under the proposed 0.8 standard?

RESPONSE: The department's metals assessment method (which addresses selenium) is available on its website (*The Montana Department of Environmental Quality Metals Assessment Method,* July 2012). For lakes, at least one data collection point is required; however additional sites can be included (this will likely be the case for Lake Koocanusa since multiple sites are already established). Data must be ≤10 years old. To assess the "once in three years" allowable exceedance rate, at least 8 samples are needed. Multiple samples from a site collected within a 30-day period would first be averaged. If more than 10 percent of the assessed samples exceed the standard, then the attainment decision is to list or to remain listed (i.e., deem the lake impaired). If the exceedance rate is equal to or less than 10 percent, then the attainment decision is not to list or delist (i.e., deem unimpaired).

COMMENT NO. 67: The proposed rule sets up a confusing situation impossible to resolve. Per DEQ's data, the lake already exceeds 0.8 µg/L much of the time. Therefore, the lake may automatically be considered "impaired" because it will not always meet the new water quality standard. An "impairment" listing implies that harm is occurring, yet none has been noted. Further, because DEQ has no permitted sources within Montana to regulate, the lake will apparently remain impaired in perpetuity. Not only is such an automatic "impairment" listing contrary to the data and evidence before the board, it also serves no valid purpose in terms of state laws and rules.

RESPONSE: The board disagrees that the proposed standard sets up a

confusing situation. The proposed selenium standard is established to protect the beneficial use. If through the department's surface water assessment process, selenium concentrations are found to exceed the water quality standard, the water body will be identified as impaired and submitted to EPA in its Integrated Report. The water body will remain designated as impaired until such time that the standard is no longer exceeded.

COMMENT NO. 68: The proposed rule is unworkable. The proposed rule inserts new concepts in the Montana Water Quality Act that are poorly defined and not understood. Fish tissue criteria are a new concept that are problematic because no accompanying assessment methodology has been provided. Additionally, "steady state" is a new concept, poorly understood and poorly defined. The proposed rule is also unworkable because it provides no mechanism from determining how violations will be determined or how enforcement will take place. It states that "fish tissue standards are expressed as instantaneous measurements not to be exceeded," but elsewhere acknowledges that selenium bioaccumulates over time. It is illogical for an "instantaneous measurement" of something that bioaccumulates over time to be used for compliance and enforcement. The proposed rule provides no logical means for determining liability for water quality exceedances. Further, DEQ states that is has no sources in Montana to regulate; therefore, not only does DEQ lack anything to regulate, it has not described how it will regulate anything or control any water quality exceedances.

RESPONSE: The board does not agree with the comment that the proposed rule is unworkable. The water column standards are intended to limit selenium accumulation in fish tissue and the proposed rule clearly states that fish tissue standards are applicable for assessment purposes. See response to COMMENT NOs. 53, 72, 73, 185, and 189.

COMMENT NO. 69: The proposed standard will be difficult to implement. Setting a water-based standard at 0.8 µg/L would result in implementation issues that have not been addressed. These include the inability of the state's commercial testing laboratories to measure concentrations this low without changes to their analytical methods that require substantial time and expense to implement. Sampling fish tissue as a supplement to the water standard also requires implementation guidance that Montana has not yet considered or developed.

RESPONSE: See response to COMMENT NOs. 53 and 59.

COMMENT NO. 70: Considering Lake Koocanusa is not currently at or below the proposed standard, the draft rule will set up a scenario where the lake may be considered impaired. We are concerned that setting the proposed standard below the current selenium level will not have a path to being undone and the science does not support the low standard. We believe that the study of selenium in Lake Koocanusa has produced some great information, but there is still a lot of information that is missing or inconclusive. We do not see a need for immediate action. Immediate action could drastically affect the future of the industry and the economy of Lincoln County.

RESPONSE: The board acknowledges the concern of the commenter but

does not agree with the comment. See response to COMMENT NOs. 47, 61, and 161.

COMMENT NO. 71: Will data taken to enforce the proposed 0.08 µg/L standard be collected only during the runoff season, during non-run off season, or will an average or median number be considered? Will that trigger the specific regulatory actions when the lake is deemed impaired? What are those actions?

RESPONSE: The board presumes the commenter means 0.8 µg/L which is the water column standard for Lake Koocanusa proposed in this rulemaking. As stated in the proposed rule, water column standards are the numeric standards for total dissolved selenium computed as a 30-day average, not to be exceeded more than once in three years. See response to COMMENT NO. 66.

COMMENT NO. 72: The proposed rule would result in the lake likely indefinitely impaired with no way to regulate to bring the lake into compliance. Why rush to do this?

RESPONSE: Water quality standards are established for the protection of the beneficial use. The standard will be the basis for water quality assessments, making impairment determinations, development of Total Maximum Daily Loads, establishment of permit limits and enforcement. Establishing the numeric standard is part of the process that furthers our ability to protect the beneficial use through multiple programs and process steps that build from the setting of a water quality standard. This includes engagement with federal partners to ensure trans-boundary clean water treaty commitments are maintained. The standards adoption process under the Clean Water Act is designed to set protective standards based on existing science, with states required to revisit water quality standards every 3 years, subject to public review, and resubmittal to EPA. A protective water quality standard is the best tool federal agencies have to ensure that water flowing across the boundary from Canada is not polluted on either side to the injury of health or property in the US as required by Article IV of the Boundary Waters Treaty, and to give the US the clarity and certainty to ensure that Canada is accountable for meeting Article IV. See also, response to COMMENT NO. 67.

COMMENT NO. 73: How will enforcement be handled if tissue samples exceed the standard? Is one fish sample enough to support enforcement or regulatory action, or will that require multiple fish samples over some period of time? How will the lake and the river be assessed and how often?

RESPONSE: See response to COMMENT NOs. 53, 66, 74, and 189.

COMMENT NO. 74: What will enforcement of the proposed standards look like?

RESPONSE: Enforcement of the standard may be achieved through development of a TMDL to allocate loads and reduce sources of pollutants to achieve the water quality standard. Compliance with the standard is typically achieved through multiple programs, including incorporation of effluent limitations, and other terms and conditions in discharge permits. See response to COMMENT NOs. 4, 53, 61, 66, 67, and 72.

COMMENT NO. 75: What is the plan of action if selenium in Lake Koocanusa is over the proposed 0.8 µg/L?

RESPONSE: See response to COMMENT NOs. 4, 53, 61, 66, 67, 72, and 74.

COMMENT NO. 76: We see no benefit, only problems and confusion, from this proposed rule. The average selenium level of Lake Koocanusa is 1.0 microgram per liter, which is greater than the proposed standard of 0.8 micrograms per liter. This indicates that most of the time, the lake will exceed the proposed standard, creating a situation where the lake will be perpetually impaired. And to what end? The department does not have anything to regulate to bring the lake into compliance with this low standard, meaning that Lake Koocanusa will forever be impaired. We urge the board to not promulgate this rule, as proposed, because it will create a scenario that is impossible to resolve.

RESPONSE: The board does not agree with the comment. The board recognizes that the lake will probably be considered impaired for selenium if the proposed standard is adopted. The board also acknowledges that, at this time, there are no sources in Montana to regulate. However, there is no reason to believe the lake will be forever on Montana's impaired waters list; it is clear in Table 1-5 of the department's technical support document that selenium loads from Canada have great potential to be reduced if proper actions are taken in the Elk River. Adoption of the standard is the basis for implementation of pollutant reduction plans to achieve the site-specific standard and protect aquatic life in Lake Koocanusa and the Kootenai River. See also, response to COMMENT NO. 66.

COMMENT NO. 77: The following comment consists of counterpoints to the comment stated during the public hearing (paraphrased) as follows: MT will not be able to enforce the selenium standard, so it should not update or set a new, more restrictive standard.

Counterpoints include: If MT does not adopt the proposed, updated standard, the legal level of selenium will remain at 5 ppb, even though the multi-agency six-year effort concluded that it has to be at maximum 0.8 ppb to protect the fish in the reservoir. The proposed standard allows MT to protect its waters by setting a protective limit that can be enforced via international treaty or via legal means within the US (Teck has an American subsidiary, has been found liable in US courts for pollution from the Trail smelter in Canada that flows into Washington State, and does business in Montana so is subject to Montana's "Long-Arm Law"). Given the six years of data demonstrating the need for a protective standard, Montana stands to be liable itself for releasing water into Idaho that does not meet Idaho's standard.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 78: The sudden implementation of an aqueous Se standard of 0.8 µg/L for Lake Koocanusa - which is six times more restrictive than Montana's standard for Se in other surface water and nearly two times more restrictive than the U.S. EPA standard – is untimely, unnecessary, and unachievable.

RESPONSE: The board disagrees with the comment. The proposed

standard was developed over a multi-year collaborative process among many stakeholders. The department has presented data indicating a site-specific selenium standard for Lake Koocanusa is necessary (see response to COMMENT NO. 136). Achievability will depend on the degree of work undertaken in Canada to control the elevated selenium loads coming out of the Elk River.

COMMENT NO. 79: The proposed rule lacks scientific evidence, is incomplete, and is unrealistic.

RESPONSE: The board disagrees with the comment. The development of a site-specific selenium criterion for Lake Koocanusa implements a peer-reviewed and science-based approach, as recommended by EPA (2016), for ascertaining protective tissue and water quality criterion for the reservoir. See also, response to COMMENT NOs. 28, 78, 110, and 159.

COMMENT NO. 80: The following comment consists of counterpoints to the comment stated during the public hearing (paraphrased) as follows: The standard means Lake Koocanusa is already impaired and cannot be remediated.

Counterpoints include: The only way to remediate Lake Koocanusa is to adopt a more protective standard. Without a protective standard, water quality will remain impaired and Montana will not have the legal standard to enforce remediation. If Teck's technology cannot "stabilize and reduce" the selenium contamination, Montana and Lincoln County may be entitled to financial compensation, or other mitigation to offset the loss of "beneficial uses" and other impacts. If we do not adopt a standard now, Montana will not have any leverage over the BC process of permitting mine expansion by Teck or the other proposed mountaintop removal mines currently under consideration by the province. The result will be a continuing increase in selenium loading to Montana waters.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 81: How would these fish tissue concepts be implemented into permits?

RESPONSE: There are no current permits that would be affected by the proposed rule. The proposed rule includes the following language, "Permit conditions and limits developed from water column standards comply with fish tissue standards." Implementation of this rule will be addressed in a forthcoming guidance document. This follows the process defined in the EPA national criteria recommendations. See response to COMMENT NO. 26.

COMMENT NO. 82: Would this standard mean that we will have to have zero degradation, for all projects moving forward? If we propose any kind of subdivision or any kind of new mining development or any kind of industry, do they have to spend millions and decades trying to figure out if they can actually have zero selenium going into the river?

RESPONSE: Some level of change is allowed in high quality waters (high quality waters are those in which water quality is currently better than the standard). For discharges where selenium is a pollutant of concern, if the discharge meets the nonsignificance criteria in ARM 17.30.715, further nondegradation review may not

be required. For toxic compounds like selenium, a change to high quality water is not significant if the resulting concentration outside of a designated mixing zone does not exceed 15 percent of the applicable standard. If the water body is not considered a high-quality water, then a discharge would need to meet the water quality standard at end-of-pipe. See also, response to COMMENT NO. 50.

COMMENT NO. 83: The rule does establish a nondegradation trigger value that is set at a very low method detection. We would like to know if the department has contacted laboratories or can provide some sense of whether or not that can be measured and at what cost before imposing a limit like that. Second, if the nondegradation limit is set at that, what would that mean for future permitted discharges? Does it mean that any measurable amount of selenium will exceed the trigger value and require treatment prior to discharge?

RESPONSE: As stated in the rule notice, the department will include a second selenium trigger value in DEQ-7 at a concentration of 0.02 µg/L. This is the method detection limit (MDL) for very sensitive selenium analysis, and because it is an MDL, it is appropriate to use as a trigger value. Exceeding a trigger value does not necessarily mean treatment will be required prior to discharge; the next test is whether the discharge will result in change to water quality that is significant, requiring nondegradation review and implementation of treatment or other water quality protection practices. See also, response to COMMENT NOs. 58 and 82.

COMMENT NO. 84: Years of data from the Elk River upstream of Lake Koocanusa through the lake and down into the Kootenai River below show unequivocal, steady increases in levels of selenium in the water column and in fish tissue as a result of ongoing and proposed increases in coal mining and processing in the Elk River headwaters of British Columbia.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 85: We cannot expect BC to protect Montana water quality if they are not protecting their own waters or people in the Elk Valley.

RESPONSE: The board acknowledges the concern of the commenters. The mission of the department is to protect, sustain, and improve a clean and healthful environment to benefit present and future generations.

COMMENT NO. 86: Currently there are proposed mine expansions as well as application for new mining permits in the Elk Valley. The selenium problem may only get worse and will not be going away anytime soon. Setting the DEQ's proposed standard is a first, critical step in protecting Montana's aquatic resources.

RESPONSE: The board agrees that a protective standard for Lake Koocanusa and the Kootenai River must be set. The department believes comments related to mining activity, treatment, mitigation, and compliance in the Elk Valley, British Columbia are outside the scope of this rulemaking.

COMMENT NO. 87: Failing to adopt the proposed standards leaves Montana without the necessary legal tools to compel compliance from British Columbia, provide for mitigative relief, and protect the aquatic resources of these waterbodies.

RESPONSE: See response to COMMENT NO. 72.

COMMENT NO. 88: This standard fails to account for Teck's increasing success in source control and water treatment, which is significantly reducing selenium load to the Elk River and Lake Koocanusa. These selenium models used must consider the reduction in selenium and release in setting any standard.

RESPONSE: The board recognizes and commends investment in selenium control by the Canadian coal company operating in the Elk Valley. The department has determined the appropriate data for developing a site-specific standard for Lake Koocanusa is data from the site. In this case, the site is defined as Lake Koocanusa. This follows guidance outlined in the EPA national criteria document (EPA, 2016). The available effluent water treatment data at mining operations in the Elk Valley, British Columbia is considered by U.S. federal agencies such as the U.S. Environmental Protection Agency as they participate in an independent expert review of saturated rock fill (SRF) technology proposed for use by Teck Resources for its coal mining operations in the Elk Valley, British Columbia. Effluent or source pollutant data may also be used for provincial regulatory purposes.

COMMENT NO. 89: The company applying to develop that new mine has admitted repeated violations of Canadian pollution guidelines, and remains under federal investigation through the Canadian Fisheries Act for selenium contamination. Already, British Columbia's waterways immediately downstream of existing mines faced a near collapse (~90 percent) of their fishery, and in US waters trends show selenium concentrations increasing and further increasing downstream into Idaho. The company was recently subject to a Direction under the Fisheries Act that requires them to take certain action that it is hoped will limit selenium and other pollution in the long term, but it is unknown if these actions will be effective. The company has also repeatedly violated provincial pollution limits, even when those limits were suggested by the company themselves at levels far above those considered safe for fish.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 90: The history at this border has proved that the state of Montana cannot rely upon Canada to enforce protection of our interests, and without a selenium standard we cannot enforce protection on our own. Once a standard is set, however, several enforcement options become available, including the Boundary Waters Treaty of 1909 and the International Joint Commission, as well as the Clean Water Act, the Endangered Species Act, CERCLA Superfund law, and other diplomatic avenues.

RESPONSE: The board acknowledges the comment and agrees that adoption of a scientifically sound water quality standard for selenium on Lake Koocanusa, a trans-boundary waterbody, is the critical first step for any subsequent assurances or actions on clean water commitments.

COMMENT NO. 91: Selenium is a difficult pollutant to see the effects of directly and also a pollutant that quickly goes from merely risky to highly dangerous as concentrations increase. Even if pollution is causing reproductive failure for a

certain proportion of a fish population, the effects might not be seen until they reach a tipping point where populations collapse.

RESPONSE: The board agrees that selenium toxicity occurs most often at the reproductive stage, and the proposed standard is being established to prevent harm to the beneficial use. See also, response to COMMENT NO. 145.

COMMENT NO. 92: Regardless of what might happen with water treatment, the biggest challenge is much longer term. Selenium leaching from the Elk Valley waste rock dumps will continue for an unknown length of time. Even waste rock from the 1970s is still leaching at its maximum rate. Selenium will keep flowing from the Elk Valley for centuries, perhaps longer. The company has not made any plans to deal with the pollution problem beyond their short-term treatment facilities—and that leaves our waterways facing a ticking time bomb of water pollution that will go off as soon as water treatments ends. Once BC and Montana adopt a shared standard, crucial discussions to push Teck to develop a plan to meet that standard over the coming centuries can begin.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 93: The proposed rule inappropriately focuses on Teck's British Columbia operations. No other Montana water quality standard rulemaking process has been, nor should be, premised on a single corporation's operation, let alone a corporation that operates on the other side of an international border and is wholly regulated by a foreign government.

RESPONSE: The board agrees that water quality standards should not be premised on a single corporation's operations. Rather, water quality standards, under the Clean Water Act, must be based on sound scientific rationale for the protection of the beneficial use. The department has demonstrated this rationale for selenium standards that protect the aquatic life of Lake Koocanusa.

COMMENT NO. 94: Teck's operations are appropriately regulated by British Columbia. British Columbia is already appropriately regulating selenium issues that may, arguably, impact Lake Koocanusa.

RESPONSE: The board acknowledges the comment. The proposed water quality standards for Lake Koocanusa and the Kootenai River are for protection of the aquatic life in those Montana waterbodies.

COMMENT NO. 95: The following comment consists of counterpoints to the comment stated during the public hearing (paraphrased) as follows: We should just wait for Teck's active water treatment and saturated rock fill (SRF) to work to reduce selenium levels.

Counterpoints include: SRF is an experimental technology, currently in use at one pilot facility in the Elk Valley, and the technology has not been proven at scale. Teck has failed to stabilize and decrease pollutant trends as required under the Elk Valley Water Quality Plan and has failed to meet selenium pollution limits in BC in Lake Koocanusa and upstream in the Elk Valley, despite their pilot SRF and one water treatment plant. Teck has not shared peer-reviewed data from their mitigation technologies verifying that they are actually effective at the scale of the mines. Teck

may have a working technology, but they have publicly stated that it will be many years, decades, before it can be implemented at the scale of the mines. Teck is under investigation by Environment and Climate Change Canada for violations of the federal Fisheries Act. This includes major native trout population declines downstream of their biggest mine, where selenium pollution is at its highest. The US EPA hired independent experts to review the SRF technology and concluded that there was not sufficient evidence that it would be effective at mitigating mining contamination and highlighted that it is unknown if the selenium can be kept in the SRF once it is closed. The regulation should be set based on the scientific conclusions of the level of selenium needed to protect fish, not on what Teck is promising.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 96: Knowing also that the selenium is coming from coal mining in Canada which is beyond Montana's reach places the State of Montana and its citizens at a standstill. I believe that the practical outcome would be to shut down Montana for any development that could take place in our state. Furthermore, Canada and the mining companies are treating the water, successfully, so impacts are not increasing as previously predicted by officials and as more water is treated decreases should occur.

RESPONSE: The development of a site-specific selenium criterion for Lake Koocanusa implements a peer-reviewed and science-based approach, as recommended by EPA (2016), for ascertaining protective tissue and water quality criterion for the reservoir. The process is independent of any other considerations and is guided solely by science. In other words, criteria development is a stand-alone process that informs what levels of selenium in Lake Koocanusa are protective for fish. Existing or proposed water treatment capabilities in Canada as mentioned by the commenter, or existing or proposed permitting or development activities within the State of Montana, are irrelevant to the development of the criteria. See also, response to COMMENT NOs. 47 through 51.

COMMENT NO. 97: Selenium concentration in Lake Koocanusa has averaged about 1.0 µg/L annually for quite a few years. Indications are that in coming years, a high percentage of selenium will be eliminated or reduced from drainages by Teck Coal through a couple different selenium elimination processes. I have visited these facilities and heard the pride of success in the voices of the local folks who are doing the work. A very high percentage of selenium is being cleaned from water before it leaves the mine.

RESPONSE: The board acknowledges the comment. The department commends the research and development efforts Teck Coal is implementing with regards to selenium treatment. The 2019 average selenium concentrations in Lake Koocanusa were about 0.95 µg/L, with limited treatment occurring in Canada. Additional and improved treatment should only result in a reduction in selenium pollution.

COMMENT NO. 98: For the last several years I have seen the signs of selenium poisoning on rainbow trout and westslope cutthroat trout in the Kootenai

River.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 99: Failing to adopt the proposed standards risks possible permanent collapse in the Lake Koocanusa and Kootenai River wild and native coldwater fishery. From a fisheries standpoint this is especially concerning since this system is home to threatened species such as Endangered Species Act-listed bull trout and white sturgeon, as well as Montana identified Species of Special Concern westslope cutthroat trout.

RESPONSE: See response to COMMENT NO. 3.

COMMENT NO. 100: Insect levels have shifted simply due to the significantly reduced nutrient flows caused by the construction of Libby Dam. Increased selenium levels upstream in the Elk River headwaters have added an insidious, destructive element to the most basic life forms in the river.

RESPONSE: The department acknowledges the concern of cumulative impacts to the aquatic ecosystem.

COMMENT NO. 101: The proposed standards are necessary to protect designated beneficial uses in Idaho including protection of endangered populations of sturgeon and burbot in the Kootenai River.

RESPONSE: See response to COMMENT NO. 3.

COMMENT NO. 102: Fish sampling in the Kootenai River in Idaho has found mountain whitefish egg and ovary samples in exceedance of the Idaho standards and the state of Idaho has listed the Kootenai River as impaired for selenium. Idaho must now adopt a TMDL in order to achieve water quality standards and protect designated beneficial uses. Idaho will likely assign a selenium load allocation to the State of Montana.

RESPONSE: The board understands Idaho will be assigning a selenium load allocation to the State of Montana in order to reduce the load of selenium from Montana to Idaho. The board also understands that Idaho DEQ requires reductions in the selenium concentrations in the Kootenai River in Idaho to avoid further violations of Idaho Water Quality Standards. Idaho DEQ has also specified they do not support permitting of additional land-disturbing activities, which result in increased selenium concentrations in the Kootenai River until such time as concentrations are below the criterion in Idaho Water Quality Standards (IDAPA 58.01.02.210).

COMMENT NO. 103: I have watched the Fording River fishery collapse in the five years I have been fishing in the Elk River drainage in neighboring BC. It went from a great fishery, to a fishery with only big fish, to just a few fish. Spawning gravel has been solidified by Teck Coal's operations. Selenium levels only continue to rise. I fish every year in the Kootenai, putting in at Troy and taking out at Twin Rivers in Idaho. Will you let upstream polluters violate existing treaties protecting our rivers downstream from them?

RESPONSE: The board acknowledges the comment and the proposed

standards are for the protection of aquatic life in Lake Koocanusa and the Kootenai River.

COMMENT NO. 104: Both Montana and BC have agreed to adopt a shared standard based on the best available science in 2020. If Montana adopts this standard in 2020, we believe it is reasonably likely that BC will follow suit and adopt the shared "one lake, one number" standard for Lake Koocanusa as planned, likely in early 2021 due to delays brought on by the recent election in our province. If Montana does not adopt this standard now, we fear that BC will use any sign of uncertainty as an excuse to delay or weaken a provincial standard for Lake Koocanusa. BC's current unenforceable guideline for selenium pollution is 2.0 µg/L and BC has already allowed selenium levels to peak at more than 2.5 µg/L in the Canadian portion of the reservoir. If Montana does not move forward to adopt this selenium limit, we fear BC will continue to allow selenium levels to rise over the long term.

RESPONSE: The board acknowledges the comment and agrees the most preferable outcome is an aligned selenium standard for Lake Koocanusa on both sides of the border. Montana will continue to work with BC to achieve this outcome.

COMMENT NO. 105: The proposed standards are based on many years of data collection and sound science.

RESPONSE: The board agrees with the comment.

COMMENT NO. 106: The proposed standards are based on six years of research and represent the best available scientific information.

RESPONSE: The board agrees with the comment.

COMMENT NO. 107: The USGS and US EPA have employed the best selenium scientists in the country to derive these standards as part of the Selenium Technical Committee.

RESPONSE: The board agrees with the comment.

COMMENT NO. 108: A lot of the information that we need still has not been collected.

RESPONSE: The board presumes the commenter is referring to data for Lake Koocanusa and acknowledges the commenter's desire to collect more data. The department believes the multi-year data collection effort produced reliable and appropriate data to support the derivation of the site-specific dissolved selenium standard for Lake Koocanusa following the guidance defined in EPA (2016). A multi-agency data collection effort continues for Lake Koocanusa and that data will be incorporated into the department's future triennial review processes for review of the state's water quality standards.

COMMENT NO. 109: The following comment consists of counterpoints to the comment stated during the public hearing (paraphrased) as follows: the science is not sufficient or is unclear or ambiguous.

Counterpoints include: The science was led by state, federal, provincial, tribal

governments, and Teck Coal Ltd. The process included six years of meetings with these parties to decide what data to collect, why and where. There was complete buy-in on all aspects of the process. The USGS model for calculating the appropriate standard has been peer-reviewed, and all the data and the model itself are publicly available for review. The data clearly show that Koocanusa Reservoir is already impacted by selenium and certain species of fish exceed safe levels of selenium. The science from multiple entities (MT FWP, MT DEQ, USGS, ACoE, Teck Coal) shows that Koocanusa Reservoir is particularly sensitive to selenium pollution and that the national EPA standard will not protect all species of fish in the reservoir. Among the SeTSC there was broad consensus, except for one scientist, a consultant who is paid by Teck, that the limit should be less than 0.9 µg/L. This consensus indicates that the science is clear and conclusive. That Teck's consultant reached a different conclusion is not material to the process at hand as Teck has business interests in keeping pollution limits as high as possible.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 110: The paper applying the selenium model to Lake Koocanusa, upon which the proposed rule relies, was not peer reviewed.

RESPONSE: The work of Jenni et al. (2017) and Presser and Naftz (2020) are both interpretive reports, which in fact undergo a thorough colleague review process whereby a minimum of two individual technical experts in either the USGS or other government agencies provide critical review of the document. The USGS follows the rigorous scientific protocols defined in the USGS Survey Manual 502.3, which includes approval by the center director and a delegated bureau approval officer. Moreover, the global model described in Presser and Luoma (2010) was published in the open scientific literature and therefore was subject to peer-review. The only changes made by Presser and Naftz (2020) were to the model inputs (not the model structure itself). Hence the model has undergone peer-review at a number of levels.

COMMENT NO. 111: The report and model developed by the US Geological Survey was developed by the leading cohort of selenium scientists in North America, with decades of experience researching selenium. This model represents the best available science on the planet with regard to selenium contamination, and was developed with a conservative and protective approach. The standards derived from this effort are uniform across multiple analyses, including federal, state, tribal, and provincial agencies. The only outlier was the analysis by the coal company itself, which perhaps is not unexpected given the company's financial interests in blocking standards that protect downstream waterways and fisheries.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 112: We note that the USGS modelling for Lake Koocanusa is far stronger than the modelling undertaken by Teck and their consultants to set selenium pollution limits in BC as part of the Elk Valley Water Quality Plan. We question Teck's sincerity in their attempts to call into question the USGS modelling on this basis, especially as Teck has been part of the Koocanusa process since it began. It was only after it became clear that the results were not to Teck's liking that

their complaints began.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 113: The USGS report is, to our knowledge, only peer reviewed inside the USGS. So, we request the state take the time to have this modeling work truly peer reviewed.

RESPONSE: It is the department's understanding that the colleague review was undertaken by experts outside of USGS to further strengthen the scientific process. See also, response to COMMENT NO. 110.

COMMENT NO. 114: The derivation document is technically deficient. DEQ has not responded to, nor explained, its deviation from the expert recommendations offered by the Subcommittee members, which is unreasonable, arbitrary and capricious given the high level of expertise recruited for the Subcommittee and the technical acuity of their recommendations. Notably, the Subcommittee could have, but was not requested to review or provide input on either the Proposed Rule or DEQ's Derivation Document. Without review and input from the Subcommittee, the Proposed Rule cannot be said to incorporate the best available science.

RESPONSE: The board does not agree with the comment. The Technical Support Document (TSD) (DEQ, 2020) does not require the review of the SeTSC, nor did the department expect or request review from the SeTSC. The TSD supporting the selenium standards for Lake Koocanusa is based on foundational peer reviewed work, followed protocols defined by EPA (2016), and incorporated guidance by the SeTSC and LKMRWG.

The department's process for responding to recommendations of SeTSC members was outlined during a SeTSC meeting, clearly noting that neither the department nor BC-ENV would be providing individual responses to the recommendations provided. In addition, DEQ (2020) includes outlines of the derivation process by the department in collaboration with the BC-ENV. The SeTSC was involved at every step of the multi-year derivation process, including providing recommendations on model inputs and final criteria. Each of these recommendations was considered and incorporated in subsequent model runs and analysis conducted by the department and BC-ENV. The model produced a range of candidate criteria and a policy decision was made regarding the level of protection of the aquatic life beneficial use. Four members opted to provided final recommendations. Three of those four recommendations were between 0.6-0.85 µg/L. There was a single SeTSC member who recommended 1.5 µg/L (See COMMENT NO. 9). The proposed rule is based on and supported by the best available science. The proposed rule is based on the updated EPA 2016 304(a) guidance, which utilizes the peer reviewed Presser and Luoma (2010) model, tailored to the Lake Koocanusa ecosystem (Presser and Naftz, 2020). Additionally, model input recommendations were solicited from SeTSC members. The department looks forward to continued and further engagement with the SeTSC on subsequent selenium related topics as identified by the LKMRWG Steering Committee.

COMMENT NO. 115: Figure 2-9 of the TSD shows no increasing trend in

selenium concentrations and the bulk of the data is below the federal guideline. According to Figure 1-7, selenium loads increased during a period of time following the run off season. Are all these data points in Figure 2-9 taken during the same season each year? What are the dates of each data point taken in Figure 2-9?

RESPONSE: The data in Figure 2-9 represent in-pool observations from 2012 through 2018, including samples at all depths and locations. Due to the short period of record and spatial variability in the sampling, a trend cannot be characterized directly from those data. An increase in loading trend is unequivocally apparent in Figure 1-6. Data displayed in Figure 2-9 is primarily from the months April through November. All data points are publicly available through the EPA WQX water quality portal.

COMMENT NO. 116: We were impressed that scientists serving on the SeTSC from various agencies and First Nations all recommended a standard less than 1.0 µg/L for Lake Koocanusa. We think that narrow range represents a scientific consensus.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 117: The proposed DEQ selenium standards are appropriate, well-vetted, and agreed upon standards resulting from more than five years of consultation by first the LKMRWG, which formed the Selenium Technical Committee comprised of scientists from the aforementioned agencies and entities.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 118: The scientific process is being rushed. The derivation document was only provided to the public eight days prior to initiating rulemaking. There has been no time for collaboration, revisions, shared understanding or efforts to improve the rule. There has not been consensus among the selenium technical subcommittee.

RESPONSE: The scientific process has not been rushed. In accordance with the Montana Administrative Procedure Act, the proposed NEW RULE I was provided to the Water Pollution Control Advisory Council (WPCAC) in accordance with 75-5-307(1), MCA, to allow WPCAC 30 days to comment on the proposed rule prior to first publication of the notice of the proposed rule. In addition, collaboration and project understanding has been on-going throughout the five-year development of the proposed standard. See also, response to COMMENT NOs. 114 and 119.

COMMENT NO. 119: The rulemaking process employed for this proposed rule has been problematic and unreasonable because it short-circuited and then bypassed the planned, consensus driven, collaborative, science-based process established through the committee and subcommittee. It did not allow time for expert dialogue and consensus. It is inconsistent with previous water quality standard rulemakings, and it disregarded requests from, and concerns raised, by Montana legislators and Lincoln county commissioners.

RESPONSE: The commenter is mistaken to understand that there was an expectation by the LKMRWG Steering Committee, the SeTSC co-chairs, or the broader SeTSC to seek consensus. The SeTSC co-chairs specifically noted during

the LKMRWG meeting held November 2019, that the SeTSC would not be seeking consensus. The co-chairs described to the SeTSC and LKMRWG how recommendations would be considered by the regulatory agencies and LKMRWG Steering Committee (BC-ENV and DEQ), and that final decisions for deriving a protective dissolved selenium standard for Lake Koocanusa were to be made by the regulatory agencies, informed by the science guided by the SeTSC. See also, response to COMMENT NO. 114. This rulemaking effort met all requirements of MAPA, 2-4-301, MCA *et seq*.; the WQA, 75-5-307, MCA; and the federal Clean Water Act. See response to COMMENT NOs. 16 and 28.

COMMENT NO. 120: Experts were never provided the opportunity to review and consider each other's comments. In fact, the Subcommittee comments on the model were not provided until the end of August, after the last Subcommittee and Committee meetings. It was therefore impossible for either the Subcommittee or the Committee to review and discuss the expert recommendations regarding the model inputs and the use of the model. This missed opportunity counsels against any conclusion that the modelling report upon which the proposed rule is based in the best available science. Given the time, effort, and expense already devoted to this project, it does not make sense for DEQ to abandon that process, deny requests for additional time, and abruptly end six years of collaborative work without reaching a final consensus or even a majority decision – indeed without even receiving input from the specially recruited experts.

RESPONSE: The board disagrees with the comment and strongly notes that the department did not abandon a pre-defined process. The assertion of a missed opportunity for further dialogue is solely the opinion of the commenter. On the contrary, the LKMRWG and SeTSC co-chairs informed the LKMRWG and SeTSC of the timeline at every opportunity in addition to publicly posting the BC-MT Workplan which defined the timeline in greater detail. Both the SeTSC and LKMRWG Monitoring and Research Committee (MRC) co-chairs have been in communication with the broader group to provide updates. The specially recruited experts provided significant input which has been considered by the department in development of the selenium standards for Lake Koocanusa. The department looks forward to continued collaboration with the SeTSC on future topics agreed upon by the LKMRWG Steering Committee. See also, response to COMMENT NO. 119.

COMMENT NO. 121: The group of experts that was convened on this topic never reached consensus and did not even reach a majority decision. This raises concern about the scientific basis for the rule. More work should be done with experts to obtain consensus, or at least a majority decision, before the rule is finalized.

RESPONSE: See response to COMMENT NO. 119.

COMMENT NO. 122: The lack of understanding how the SeTSC members' comments were incorporated causes us to question the scientific validity of the draft rule and whether the science has been sufficiently developed to support rulemaking at this time. At a minimum, it seems to require more work among the experts, and in turn, proper consideration of that input in any proposed standard-setting. Here, two

leading national selenium experts provided comments that have not been addressed, nor does there appear to have been any continuing dialogue with those experts that the public and regulated community could consider.

RESPONSE: See response to COMMENT NOs. 23, 110, 119, and 120.

COMMENT NO. 123: The following comment consists of counterpoints to the comment stated during the public hearing (paraphrased) as follows: The proposed standard lacks the consensus of the Selenium Technical Subcommittee members.

Counterpoints include: Every entity on the committee with the exception of Teck agreed that Lake Koocanusa requires a standard that is below 1.0 ppb (all the recommendations were between 0.6-0.9). Only Teck recommended (through their consultant) a criterion above 1.0 ppb, recommending 1.5 ppb. We question the integrity of Teck's position at the scientific table (SeTSC) as they are a self-interested party.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 124: DEQ has not described how the differing views of the SeTSC experts were considered in the proposal.

RESPONSE: The department reviewed all recommendations provided by individuals of the SeTSC. Those recommendations on both final numeric recommendations and model assumptions were reviewed and considered, additional model scenarios were completed, the results of which were analyzed. The recommendations of the entire SeTSC guided the department's decisions.

COMMENT NO. 125: Only data from 2014 forward should be used as that is when Teck improved their treatment and significant changes happened.

RESPONSE: The modeling effort does not utilize pre-2014 data for predicting a protective dissolved selenium concentration for Lake Koocanusa. Presser and Naftz (2020) did include pre-2014 data in the context of defining trends in species composition and density, but these were not included in calculation of Kd values in the modeling.

COMMENT NO. 126: The derivation document wrongly relies on data from the Elk River from the 1980s through 2019 to establish increasing selenium trends.

RESPONSE: The board does not agree with the comment. There is a clear increasing trend in selenium concentrations from 1984 through 2019 detected at the federal Canadian long-term monitoring station located on the Elk River, BC (Figure 2-A; Presser and Naftz, 2020).

COMMENT NO. 127: Why is there no data from water treatment being collected, gathered, and studied?

RESPONSE: There is extensive data collection and analysis occurring in Elk Valley, BC at the site of water treatment plants. See response to COMMENT NO. 88.

COMMENT NO. 128: The following comment consists of counterpoints to the comment stated during the public hearing (paraphrased) as follows: the proposed

standard is not derived from site-specific data.

Counterpoints include: The model took into account six years of site-specific data for Koocanusa Reservoir including paired samples for water, suspended sediment, algae, invertebrates, and fish. The data showed that selenium is being taken up by algae, bugs, and fish in the reservoir. At the beginning of the process in 2014, it appeared likely that the site-specific criteria would come in at the national EPA number of 1.5 µg/L, yet the data collected over the intervening years actually demonstrated that the national criteria would not protect the fish in the reservoir.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 129: What is the contribution of selenium in other streams to Lake Koocanusa and the Kootenai River?

RESPONSE: The department reviewed all selenium data it has collected over the years in surface waters of the Lake Koocanusa/Kootenai River watershed (HUC 17010101). Sampling has occurred for a variety of projects and purposes, e.g., to support Total Maximum Daily Loads, monitor regional lakes, and characterize high-quality (reference) streams. In July 2016 the department collected total and dissolved selenium at or near the mouth of all major (and several minor) tributaries where they join Lake Koocanusa (on the west side Young, Sullivan, Boulder, Big, Parsnip, Ural, Bristow, and Barron creeks, and on the east side the Tobacco River and Pinkham, Sutton, McGuire, Tweed, Sheep, Tenmile, Fivemile, Warland, Cripple Horse, and Canyon creeks). The reporting limit for these samples was 0.9 µg/L (just above the proposed lake standard of 0.8 µg/L) and no selenium was detected in any of the samples from the tributaries.

Between 2004 and 2016, the department also sampled total selenium in several tributaries to the Kootenai River (from the north: Bobtail Cr and the Yaak River; from the south: Dunn, Libby, and Lake creeks). The reporting limit for these samples was ≤1.0 µg/L, below the proposed standard for the river (3.1 µg/L). There were no detections among any of these 22 samples. The USGS also sampled tributaries to the Kootenai River during three seasons (spring, fall, winter) between 2018 and 2019. Tributaries in the sampling effort included the Fisher River, Yaak River, and Moyie River. All samples were reported below detection, with a reporting limit for these samples of 0.081 µg/L.

All of these findings are consistent with dozens of other water samples from numerous streams and lakes (excluding Lake Koocanusa and the Kootenai River) the department has collected in the watershed between 2003 and 2018: no selenium has been detected, with the exception of one stream (North Fork Canyon Cr) where the selenium was <0.1 µg/L. Collectively, these data suggest that the selenium contribution from tributaries to the lake and river are very low and would not contribute to standards exceedances. All data referenced here is publicly available through the EPA WQX water quality portal.

COMMENT NO. 130: The background levels do not appear to have been considered in this proposed rule. DEQ partnered with the University of Montana to document background numbers for many of Lake Koocanusa's tributaries. DEQ studies show there is natural occurrence of selenium coming in from several drainages, and naturally occurring in soils and lake bed.

RESPONSE: Background concentrations were characterized for most of the Lake Koocanusa tributaries in July 2016. Every one of the tributaries came back as below the reporting limit (0.9 µg/L) but the data suggest the concentrations in the tributaries are much lower. See also, response to COMMENT NOs. 129 and 154.

COMMENT NO. 131: Data collected and published by DEQ in 2016 indicate that all Lake Koocanusa tributaries currently exceed the proposed trigger value of 0.02 µg/L. How much selenium do soil-disturbing activities generate? Before a standard is set that will result in such extremely low permit limits, we need to know more about the sources and background levels of selenium and how those will be considered in permits.

RESPONSE: The 2016 Lake Koocanusa tributary sampling showed all tributary samples were found to be below the reporting limit of 0.9 µg/L. The results the commenter is referring to are only estimates. Additional waterbodies in the Kootenai watershed have been sampled for selenium for various projects, which all show samples for selenium below reporting limit, except for one sample detected at 0.08 µg/L. These results are corroborated by the understanding that the underlying geology in the Montana portion of the Kootenai watershed is very unlikely to release elevated levels of selenium to the environment. The geology of Lincoln County differs dramatically from the geology in the Elk Valley. The underlying geology in the Elk Valley is selenium-rich, so the anthropogenic disturbance of these seleniferous soils releases high levels of selenium to the nearby water. As noted in COMMENT NO. 52 there are no current permits affected by the proposed rule. Regarding the trigger value, see also, response to COMMENT NO. 83.

COMMENT NO. 132: Why did DEQ not present to WPIC the 2016 selenium study that indicates selenium exists in the tributaries to the lake, at some level near the proposed standard? Why is the standard being proposed at a level so near the tributary background levels? Where is the data showing non-detect levels and what is that non-detect level?

RESPONSE: The 2016 study along with other selenium data collected since 2003 show there are no detectable contributions of selenium coming from Montana tributaries to Lake Koocanusa. There are also no permitted point sources that will be impacted by the proposed rule in Montana (see COMMENT NO. 52). Moreover, the results of McDonald (2009) showed the Elk River contributed 95 percent of total selenium loading to the reservoir. Given that the results of the 2016 study show every sample was below the reporting limit of 0.9 µg/L (see COMMENT NO. 129), it cannot be concluded that the tributary background concentrations are near the level of the standard.

COMMENT NO. 133: Derivation document fails to account for naturally occurring selenium contributed to the water from band sloughing events along the reservoir.

RESPONSE: To our knowledge, no direct research has been conducted on shoreline erosion contributions of selenium to Lake Koocanusa. However, simple calculations can be made to show this is not an appreciable source. Assuming the entire shoreline of Lake Koocanusa is 980,000 lineal feet (185.6 miles), and all of the

shoreline is eroding at a height of 10 feet and lateral distance of 1 feet each year (which we think is likely a gross overestimate), and assuming a sediment bulk density of 1,500 kg/m^3 and bulk concentration of 0.21 mg Se/kg (the latter measured in DEQ, 2013), the approximate shoreline erosion contribution would be 87.4 kg per year. As a point of reference, the Elk River contribution was approximated at 13,000 kg per year in 2012 (DEQ, 2020). Shoreline erosion is not believed to be an appreciable selenium source in the watershed.

COMMENT NO. 134: The recent Arsenic TSD included estimated loadings by segment of the Yellowstone River from tributary to tributary and the contributions of tributaries. Why is this not done for Lake Koocanusa and the Kootenai River? It is crucial to know the contribution of selenium from the tributaries.

RESPONSE: To develop nonanthropogenic arsenic standards on the Yellowstone River, it was necessary to collect loading data as described in the comment, quantify human-caused arsenic sources, and then compute what the river's concentrations would be in the absence of the human-caused sources. The work ultimately led to the adoption of nonanthropogenic arsenic standards at concentrations higher (less stringent) than the previously adopted human health standard. This process is not necessary in the case of selenium standards for Lake Koocanusa and the Kootenai River. In this instance, the standards are not based on the nonanthropogenic condition, but instead, they represent a level of selenium above which harm will occur to aquatic life. Regarding the selenium contribution from the tributaries, all available data suggest that their concentrations are lower than the proposed standards, and would therefore be a source of dilution to the lake and river where concentrations are elevated due to selenium sources from Canada. See also, response to COMMENT NO. 129.

COMMENT NO. 135: Was an analysis for selenium in the Kootenai River drainage done like the HAWQS analysis for arsenic in the Yellowstone River? If not, why not and how was it determined that the naturally occurring selenium will not negatively influence the proposed standard? If so, where were the samples taken from?

RESPONSE: See response to COMMENT NO. 134.

COMMENT NO.136: The current water column concentrations are below the EPA guideline. This does not indicate a problem that warrants hurrying a rulemaking process.

RESPONSE: The board recognized that current water column selenium concentrations in Lake Koocanusa are mostly below the EPA lentic guideline of 1.5 µg/L (see Figure 2-9 in the department's TSD). However, the lake's concentrations are mostly above the concentration (0.8 µg Se/L) identified as the protective standard and proposed in this rulemaking. This suggests that emplacing a protective criterion is, contrary to the comment, of the utmost importance, as detrimental impacts may have already begun. The board does not agree that the rulemaking has been hurried.

COMMENT NO. 137: The proposed rule fails to recognize the fact that data

shows that annual average levels of selenium in Lake Koocanusa are not increasing and have been stable since 2014. It also fails to account for Teck's increasing success in source control and water treatment, which is significantly reducing selenium loads to the Elk River and Lake Koocanusa.

RESPONSE: As the department has reiterated, water quality standards are established to protect the beneficial use and not the ambient waterbody concentrations of the pollutant. Moreover, Figure 17 from Presser and Naftz (2020) show the cross-sectional area of the reservoir over 1 µg/L is increasing over the last several years. See also, response to COMMENT NO. 26.

COMMENT NO. 138: The data presented does not support the proposed rule. Water samples collected from 2013-2019 show Se concentrations ranging from 0.23 to 2.3 µg/L with an average 1 µg/L. The data set shows the lake to be in compliance with not only the Montana standard of 5 µg/L but also the more restrictive EPA guideline of 1.5 µg/L and the British Columbia water quality guideline of 2.0 µg/L. Importantly, the data, as graphed by DEQ, does not show an increasing trend in Se levels in the lake. Neither an upward trend in Se levels, nor any harm is shown by DEQ's presentation of fish tissue data.

RESPONSE: Water quality standards are the maximum allowable pollutant level that is protective of a beneficial use, in this case, aquatic life. Site-specific data were used in the bioaccumulation modeling work, accounting for site-specific conditions. Whether or not Lake Koocanusa is in compliance with the current standard (5 µg/L) or the EPA 304(a) criteria (1.5 µg/L) does not determine the protectiveness of the standard. This is particularly important in this case, where the department has determined those standards are not protective of the beneficial uses in Lake Koocanusa. See also, response to COMMENT NOs. 9, 96, and 199.

COMMENT NO. 139: The following comment consists of counterpoints to the comment stated during the public hearing (paraphrased) as follows: Selenium concentrations have not increased since 2014.

Counterpoints include: Considerable variation from year to year in the amount of selenium leaching from waste rock piles due to changes in weather and precipitation. 2014 was a high selenium year and not an appropriate baseline. Using 2014 as a baseline is cherry-picking the data to Teck's advantage. The trend is clear, selenium concentrations are increasing. Data in the Elk and Kootenai River show the same increasing trend. Data from Lake Koocanusa, going back to 2013 is consistent with the trend. The amount of selenium leaching waste rock at the mines is increasing with no sign it is leaching less selenium over time. Teck's treatment plant and SRF do not remove enough selenium to change the overall trend downstream. There is no mechanism that would stabilize the trend over the last 6 years to validate this claim.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 140: We do not see sufficient water quality data or fish tissue data supporting this proposed rule. Without sufficient supporting data, the proposed rule, although labeled "site-specific," is not connected to, and does not reflect, the reality at Lake Koocanusa. Therefore, the rule appears designed to

protect the lake from unrealistic, perceived potential harm not validated by any data. Promulgating rules that protect from unrealistic, perceived harms unnecessarily sets up an unrealistic and likely unachievable regulatory framework, which will create more uncertainty in the future.

RESPONSE: The board does not agree with the comment. See also, response to COMMENT NOs. 10, 136, 160, 161, and 177.

COMMENT NO. 141: DEQ's data on fish tissue is not conclusive. There are only four individual fish that exceed the federal guideline for egg/ovary tissue. We do not see evidence that those fish exceed the standard for whole body tissue, which was the focus of DEQ's model. We heard concerns that the data may not be appropriate, that the eggs/ovaries from those four fish may not have been "ripe" and not appropriate for sampling. Is it true that redside shiner have a higher tolerance for selenium and may naturally ingest more than other fish would? If so, where is that considered and explained in the draft rule or DEQ's publications?

RESPONSE: We presume the commenter is referencing the unpublished work funded by Teck (EcoTox, 2020) which suggests that for northern pikeminnow, the highest selenium concentrations may not be found at the time of vitellogensis. While the department recognizes this work, and acknowledges ever-evolving selenium research, the EcoTox (2020) study is not yet peer-reviewed, and draws vastly different conclusions than what is currently understood by the scientific community (presented to the SeTSC in June of 2020). With regards to redside shiner tolerance, Teck also has a draft report (again not peer reviewed) on the reproductive effects of selenium on redside shiner. The conclusions suggest the tolerance of redside shiner may be different than other species, with levels of selenium up to 28 mg/kg dw in eggs. In the future, the department may consider both of these reports following a peer review process.

It is important to note that no egg/ovary sample (or other tissue) exceedances are acceptable to EPA (2016). Moreover, there are many tissue exceedances in cyprinid fish species not referenced in the comment that prompt additional concern (see slide 13 DEQ Presentation to BER, 9/24/20). The department recognizes the science of selenium is ever-evolving. These considerations are important, and we look forward to continued discussions during the development of an assessment methodology. Presser and Naftz (2020) identified several reasons that fish egg/ovary tissue was not appropriate for modeling.

COMMENT NO. 142: Of the more than 1200 individual samples of non-segregated fish in the reservoir, only three measures exceed U.S. egg ovary criteria, and those were for fish species that are not sensitive.

RESPONSE: Three species (not individual fish) have shown egg/ovary selenium tissue concentrations above the proposed 15.1 mg/kg dw, in four different years, including 2013, 2017, 2018, and 2019 (see slide 13 DEQ Presentation to BER, 9/24/20). Between 2008 and 2013, there were significant increases in selenium concentrations in all species. In 2018, concentrations were found at lower concentrations for many species. However, several species that had limited tissue data (longnose suckers, rainbow trout, and westslope cutthroat trout) had been sampled in 2016 and 2017, and showed continued increases in Se concentrations

over 2013 sampling.

COMMENT NO. 143: The current water column concentrations of 1.0 µg/L are not resulting in fish tissue concentrations that are above the threshold, where reproductive effects start to occur.

RESPONSE: The commenter is correct that some species with tissue exceedances are not considered highly sensitive to selenium; however the species in Lake Koocanusa considered to be the most sensitive species to elevated selenium is the native westslope Cutthroat trout. Sampling of egg/ovaries in cutthroat has been difficult as they are tributary spawners, thus it has been a challenge to collect eggs from gravid females. On the US portion of Lake Koocanusa, three cutthroat have been sampled with egg/ovaries and concentrations averaged 11.43 mg/kg dw, approaching the EPA tissue criteria of 15.1 mg/kg dw. There have been no documented reproductive effects on fish in Lake Koocanusa, although MT FWP has determined it would be difficult to detect population levels effects with the limited net sampling efforts. This reinforces the importance of adopting the proposed site-specific criteria to protect against any future reproductive effects.

COMMENT NO. 144: Selenium poisoning in fish can be "invisible," because the primary point of impact is the egg, which receives selenium from the female's diet (whether consumed in organic or inorganic forms), and stores it until hatching, whereupon it is metabolized by the developing fish. If concentrations in eggs are great enough (about 10 µg/g or greater) biochemical functions may be disrupted, and teratogenic deformity and death may occur. Adult fish can survive and appear healthy despite the fact that extensive reproductive failure is occurring--19 of the 20 species in Belews Lake were eliminated as a result of this insidious mode of toxicity. The lessons learned from Belews Lake provide information useful for protecting other aquatic ecosystems.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 145: I cannot see where there is ANY science that definitely proves that elevated selenium levels in Lake Koocanusa are harmful to fish or other aquatic organisms in that environment.

RESPONSE: The department has made clear that water quality standards are not set once harm occurs, but rather in advance of that, consistent with how ALL water quality standards for the protection of both aquatic life and human health are established. For example, the department does not wait for human populations to show neurological harm to establish lead standards to protect human health. Water quality standards are set to protect the beneficial use of the water body. Sufficient evidence has been presented in Presser and Naftz (2020) and DEQ (2020) to establish a protective standard. It can be challenging to detect the effects of selenium on populations due to the fact that toxic effects of selenium exposure most often occur at the reproductive stage. This means that the point at which harm may be documented could be years later, during fish sampling efforts, where MT FWP may find decreased populations. Or impacts could be fully missed due to survivorship bias because fish sampling techniques employed by MT FWP tend to

capture adult fish. In a reservoir as large as Lake Koocanusa and limited sampling efforts to truly detect population level effects, if the department waited until there was a dramatic decline in fish populations to set a standard, that could create a scenario that would be extremely challenging to recover from.

COMMENT NO. 146: No exceedances of the whole-body Se criterion have been observed or reported. The site-specific field data suggest that current water concentrations do not result in aquatic risk. Based on evaluations of ovary Se concentrations and ovary maturity discussed for cyprinids and mountain whitefish, there is uncertainty in some of the ovary Se data for other fish species (e.g., the potential to overestimate egg Se concentration due to immature ovaries). Most ovary Se concentrations, however, fall well below EPA's egg Se criterion, so this uncertainty is unimportant for most of the cases.

RESPONSE: The commenter is correct that of the four whole body samples collected on the Montana portion of the reservoir, all were below 8.5 mg/kg dw. However, it is debatable that these limited data are appropriate to draw the conclusion that no harmful effects are occurring in Lake Koocanusa. Moreover, existing data in certain species of both cyprinid and non-cyprinid fish exceed the egg/ovary standard, which suggests impacts could already be occurring. The commenter references unpublished work pertaining to selenium concentrations in northern pikeminnow. The conclusions of that study may be considered by the department in the future, once the study has gone through peer review. Importantly, while most ovary concentrations fall below the 15.1 mg/kg dw, some species show elevated levels, increasing over time.

COMMENT NO. 147: As reported in the northern pikeminnow study (EcoTox et al. 2020), the elevated ovary Se concentrations are associated with immature ovaries as samples were not collected at the time of spawning. A similar pattern appears to have been observed in peamouth chub. Recent studies with redside shiner have yielded more information on Se bioaccumulation in redside shiner eggs and effects; specifically, the effect level is unbounded, as follows: egg/ovary > 28 mg/kg Se dw, whole body >13.5 mg/kg Se dw. These data on cyprinids in Lake Koocanusa, coupled with EPA's conclusion that cyprinids are not uniquely sensitive, based on evaluations of data from sites in the United States with high Se concentrations, indicate that it is unlikely that cyprinids in the lake are uniquely sensitive to Se and, in fact, may be relatively insensitive. Since the above-mentioned data for redside shiner are now available, they should be used and incorporated into the model.

RESPONSE: The department may consider these studies in the future, after they have gone through the peer-review process.

COMMENT NO. 148: The results of the fish tissue sampling do not show an impact for that particular species of fish based on EPA's "No Observed Effects Level," which has not been exceeded in Lake Koocanusa. Therefore, the fish tissue data does not clearly indicate adverse impacts, even when measured against the existing federal guidelines.

RESPONSE: See COMMENT NOs. 53 and 145.

COMMENT NO.149: The data I have seen on fish tissue sampling does not indicate a crisis requiring the toughest regulation in the world. The data on reproductive issues in mature or spawning age fish is not there, or I do not understand it. I see a number of concerns expressed, including downstream for burbot and white sturgeon, but I also know several other conditions have been blamed for the same concerns such as water temperature, fluctuating levels, lack of ideal spawning habitat, lack of spring floods. There seems to be generalized statements that ask for the conservative number, but I still do not see the supporting data.

RESPONSE: The board acknowledges the comment. The department has not indicated that there is a crisis. While the elevated selenium samples in both the water column and the fish tissue are cause for concern, the proposed standards are not being proposed because a crisis may or may not be occurring. Rather, the department has been collaborating with a bi-national working group with the goal of determining a protective water column standard for Lake Koocanusa. That work included utilization of the Presser and Luoma (2010) Ecosystem-Scale Model, the state of the science for modeling selenium bioaccumulation. This same model was used by EPA (2016) in the derivation of their nationally recommended selenium criteria. The water quality standard must be protective of the beneficial use. The proposed standard would ensure protection of the aquatic life beneficial use, and ensure there are no additional fish with high levels of selenium detected.

COMMENT NO. 150: The evidence about fish deformities is all anecdotal. The scientific team did not document deformities. I understand that they may not have been looking for deformities, but why not? Before we take this drastic step, we should know whether deformities are real.

RESPONSE: The board understands that the department has clarified and reiterated during many public meetings that Montana Fish, Wildlife and Parks (MT FWP) does not expect to see deformities in adult fish, the age class most commonly captured in their sampling efforts. Moreover, MT FWP has confirmed that if any deformities were observed during their sampling, that information would certainly have been recorded. The commenter should be aware that the proposed standards are not based on whether or not deformities are present. The department has made clear that it intends to protect fish populations from harmful effects at all points during reproduction, including the effect of decreased populations of fish species from reductions in fry survival. See also, COMMENT NO. 145.

COMMENT NO. 151: The WPIC hearing also included testimony on fish deformities. Deformities were reported from fishing guides in tributaries near the coal mines and also from the Kootenai River below Libby Dam. DEQ officials stated that NO deformities were found by FWP biologists studying fish tissue from fish in Lake Koocanusa. Then a DEQ official noted that the biologists had not been instructed to look for deformities. Again, it appeared that testimony about deformities may have influenced WPIC voting, at least it came up in questions and comments from the committee. If testimony about deformities is important, why was not this stressed during the studies, or why do we not take time now to gather this

data. Why weren't tests done on deformed fish to verify that selenium is the cause, or not. I am unclear on whether DEQ feels this is important.

RESPONSE: The department is happy to clarify what it meant at the statements made at the October 13, 2020 WPIC meeting. The department's statement was intended to emphasize that it is important that Montana not wait until we see direct impacts of selenium on fish and fish populations in Lake Koocanusa before adopting a protective standard. FWP has been collecting fish tissue data for years in Lake Koocanusa and that data played a critical role in this rulemaking. Additionally, the impact to aquatic life in Lake Koocanusa from increasing selenium levels is more likely to be seen as changes or decreases in fish populations and propagation. See also, response to COMMENT NO. 150.

COMMENT NO. 152: When testifying before the WPIC, DEQ Director McGrath implied that selenium is continuing to build up in the lake to a degree that immediate action is needed. But I have reviewed DEQ's "Analysis of 2013 Lake Koocanusa Sediment Data" and while it does suggest that minor settling is occurring, the rate of selenium deposition is very slow. According to this study on the sediment, there does not appear to be a measurable amount of settling. Where does the urgency come from? Has there been another sediment study since 2013? If so, where is the data?

RESPONSE: The commenter is correct that selenium loadings to Lake Koocanusa have been, and continue to increase to the waterbody. This is evident in Figure 1-6 of the TSD (DEQ, 2020). Elevated selenium concentrations also have been found by Montana Fish, Wildlife and Parks in several fish species in the reservoir, meaning trophic transfer is likely occurring in the waterbody. This could potentially be related to the sediments of the reservoir. The need for immediate action stems from the fact that egg/ovary guidelines for fish tissue samples in Lake Koocanusa are already exceeded, beyond the threshold deemed safe by EPA (2016). Accumulation of selenium in these fish can result in transfer of selenium to offspring and cause reproductive effects or reduced fry survival. Bioaccumulation of selenium therefore should not be misconstrued with reservoir sediment concentrations or the results of the DEQ sediment sampling (DEQ, 2013). The objective of the 2013 analysis was to understand if there were appreciable differences in sediment concentrations in the reservoir. The average selenium concentration in the reservoir bottom was lowest at the international border and increased significantly in the forebay. The DEQ characterization however provides no information on trophic transfer and selenium bioaccumulation in aquatic species of the reservoir. This has subsequently been further investigated by the USGS (Jenni et al. 2017; Presser and Naftz, 2020) and the SeTSC, showing appreciable risk to fish in the reservoir.

COMMENT NO. 153: My understanding is that selenium is carried in the water as a solution with selenium actually bonded to water molecules rather than travelling in a suspension which would drop to the bottom of Lake Koocanusa. This point has been misunderstood by many people. Former County Commissioner Mike Cole and I questioned this issue several years ago, and that led to a USGS study of the sediment on the bottom of Lake Koocanusa. After 45 years of this reservoir, the

USGS study showed no, or negligible, buildup of selenium at the bottom of the lake. This point was described inaccurately by the DEQ director during the WPIC meeting, and I believe that influenced one of the WPIC no votes. The request to WPIC for extended time to allow better understanding was defeated by a tie vote of 5 yes and 5 no. One more yes vote would have changed the outcome, but certainly with the votes of five legislators, half the WPIC membership, that should place reasonable doubt about going forward. Especially if you consider the senator and two representatives from Lincoln County asking for the extension, and all three Lincoln County commissioners signed a letter asking for the extension.

RESPONSE: The commenter is partially correct in their understanding of selenium in the water column. However, the underlying narrative of the comment suggests a description of selenium cycling and bioaccumulation in reservoirs is needed in our response. First, selenium exists in both dissolved and suspended particulate material (SPM) forms in Lake Koocanusa. The former is ionized in water, but not attached to the water molecules (analogous to dissolved table salt dissolved in water or sugar in coffee), while the latter is bound to suspended particles either sorbed to their surface directly or incorporated into phytoplankton or benthic algae tissue. Partitioning between dissolved and particulate selenium in the water column (e.g., how much is dissolved and how much is particulate, an important consideration in selenium transfer to high order organisms) depends on the selenium concentration in the water column and the site-specific waterbody response. Selenium transfer occurs up through the food chain by invertebrates (e.g., macroinvertebrates or zooplankton) that eat the SPM, and ultimately to fish that eat the invertebrates. Elevated selenium in fish tissue is the ultimate problem since it causes issues in fry development or survival. As you will note, the process described above has little to do with direct selenium buildup in bottom sediments, and more to do with the amount of selenium in the water column and how readily it enriches SPM.

Given this understanding, whether or not the bottom of Lake Koocanusa has accumulated selenium over the years is not the primary issue at hand. We are unaware of any study by USGS that characterizes long term concentration changes of selenium in reservoir sediments. The only study to our knowledge was done by the department (DEQ, 2013). Sediments were collected in a single sampling year and showed that reservoir sediments in the forebay (near the dam) are statistically higher than the international border site, and also are statistically higher than shoreline soils. No attempt was made to characterize selenium or sediment buildup in the bottom of the reservoir since samples would be required periodically through time (which was not done). As for whether this influenced WPIC voting, the board understands this is the commenter's opinion. A better understanding of selenium bioaccumulation should hopefully help clarify this issue for the commenter.

COMMENT NO. 154: Sediment studies show no buildup of selenium in sediment at the bottom of Lake Koocanusa after decades of existence, and the coal mine operation has gone on far longer than that. A benthic selenium study conducted in 2013 by DEQ to establish benchmark measurements "was not significantly different than in the native soils." Nothing is settling out to the bottom of Lake Koocanusa, after decades. It is not a settling pond. People do not understand,

and they give inaccurate information to others who repeat incorrect information.

RESPONSE: Similar to COMMENT NO. 153, this suggests the need for a better understanding of selenium cycling in reservoirs, and clarification about the department's past sediment studies. We have described the selenium bioaccumulation process in response to COMMENT NO. 153, and the department's understanding of selenium behavior in the reservoir can be found in the Technical Support Document describing the criterion development process (DEQ, 2020; Figure 4-1). It is the same understanding as published by federal scientists (Presser and Luoma, 2010; Jenni et al. 2017; Presser and Naftz, 2020). Furthermore, the department has not suggested that Lake Koocanusa is a settling pond, nor has the department made any robust analysis of the buildup of selenium in Lake Koocanusa sediments. The reviewer is correct that in 2013 the department did sample metals concentrations, including selenium, which was found to be statistically elevated over native soils in the forebay (near the dam) during a single sampling year; this could potentially be inferred as accumulation over time. However, multi-year sampling would be needed to prove/disprove such a hypothesis, noting the forebay was the only site that exhibited a statistical difference between reservoir sediments and native soils. Additionally, as noted in prior comments, the environmental partitioning of selenium between water and suspended particulate material is more important than accumulation of selenium at the bottom of the reservoir.

COMMENT NO. 155: At the October 13, 2020 WPIC meeting, it was implied that selenium is settling out in Lake Koocanusa and accumulating in the sediment at a rate that will cause problems over the next 20 years. However, we recently became aware of DEQ's "Analysis of 2013 Lake Koocanusa Sediment Data" which seems to conclude otherwise after finding no alarming levels of selenium in the sediment, even after the dam has been in place for 35 years. This echoes concerns raised by local legislators about the need to better understand the operation of Libby Dam and its impact on selenium levels.

RESPONSE: The questions that the department responded to during the October 13, 2020, WPIC meeting, as the department understood it at the time, are: how does Libby Dam impact how selenium affects aquatic life and is that impact greater because selenium concentrations are increasing in the reservoir? The department responded that the retention time of selenium in the reservoir poses a higher risk to aquatic life. That is why there are different standards proposed for Lake Koocanusa versus the mainstem of the Kootenai River. The department also stated that it is concerned that selenium concentrations will increase in the reservoir if the amount of selenium coming from the Elk River Watershed continues unimpeded. See also, responses to COMMENT NOs. 152, 153, and 154.

COMMENT NO. 156: When I asked questions at the last WPIC meeting it was stated that selenium settles to the bottom of the lake and did not remain in suspension. I have since found evidence to the contrary and I would not have voted for the standard recommended by the DEQ if I had known that the information provided was inaccurate.

RESPONSE: See response to COMMENT NOs.152 through 155.

COMMENT NO. 157: Very little data from the tributaries to Lake Koocanusa and the Kootenai River has been collected. The main focus is on the Elk River. Have any of the Elk River tributaries been studied to see what their contribution of selenium is? If not, why not? If so, where is the data?

RESPONSE: The main focus of the department's work is (and has been) Lake Koocanusa. With respect to the Elk River, extensive publicly available data collected in BC tributaries can be found at the British Columbia Surface Water Quality Monitoring (link below). Additionally, there is no doubt by any state, federal, or provincial agency that the preponderance of the selenium entering Lake Koocanusa is from coal mining operations in the Elk Valley, and thus the focus on the Elk River. The Canadian coal mining company operating in the Elk Valley has acknowledged this too. See also, COMMENT NO. 134. Referenced website: https://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/monitoring/tools-databases/surface-water-monitoring-sites

COMMENT NO. 158: The model is generic in nature and the model is ten years out of date. It does not use specific data and it is not state of the art modeling. Techniques for setting water quality standards have evolved considerably since 2010.

RESPONSE: The department followed the most recent mechanistic modeling approach defined in the EPA national guidance for developing site-specific selenium criteria which was published just four years ago (EPA, 2016). Moreover, contrary to the reviewer's suggestion, the generalized model of Presser and Luoma (2010) was made site-specific with recent water/particulate partitioning (Kd) data collected directly from Lake Koocanusa and through calibration of bioavailability to observations of selenium in suspended particulate matter (SPM) and invertebrates. The department is unaware of any literature that suggests the ecosystem based modeling approach recommended by EPA or used by DEQ is antiquated, or alternatively that techniques for setting water quality standards for selenium have evolved since 2016. Furthermore, the commenter has not provided any specific evidence that EPA's modeling approach is out of date, or was inappropriately used by the department to develop standards.

COMMENT NO. 159: We have concerns that the model being used is not the most current science and data available, as it is more than a decade old. The model at the time it was made showed selenium content would be far higher by this date in time. However, it does not consider the filtration systems and the changes to current mining practices that Teck Coal has brought online.

RESPONSE: The board understands that the model is state-of-the-art for selenium criteria development (EPA, 2016), and although first published as a global ecosystem model in the scientific literature a decade ago (Presser and Luoma, 2010), model inputs have been updated and made specific to Lake Koocanusa using current data (Presser and Naftz, 2020). The commenter is also incorrect in their assertion that the model would show selenium content to be far higher by this date in time. First, the model is not time-variable, nor does it make predictions of selenium content through time. Second, the model does not consider the influence of water treatment or mining practices because it solely predicts what a protective criterion

will be based on site-specific selenium partitioning and trophic transfer through the food chain.

COMMENT NO. 160: The modeling approach applied is basically a model sensitivity exercise rather than a predictive exercise. The USGS model Presser and Naftz (2020) significantly overpredicts Se concentrations in observed fish tissue. Specifically, many of the model calculations utilize input variables (i.e., TTFs) that are distinctly different from the site data, particularly pertaining to non-cyprinid fish. The argument that the site data are too variable is not valid, particularly when 99.8 percent of the above-mentioned data illustrate that fish species present are below conservative effects thresholds. It should be noted that the data used to generate the Presser and Luoma (2010) model were also site-specific (versus generic) data.

RESPONSE: The department's work in standard setting directly predicts protective water column concentrations based on several different assumptions for whole body guidelines, site-specific model partition coefficients (Kds), calibrated bioavailability factors, and a single set of trophic transfer factors (TTF) from the literature, resulting in very similar levels of protective water column standards across all scenarios. Moreover, criteria are very similar in magnitude to those recommended by several of the SeTSC members using a variety of assumptions, and closely approximating the 20th percentile of model runs done by USGS for sensitive food webs (e.g., the IFM and TFM 100 percent aquatic insects scenarios). The department's approach and resulting criterion, therefore, can hardly be characterized as a sensitivity approach towards criteria development.

Furthermore, with respect to the commenter's assertion that a large percentage of the non-cyprinid fish data are below conservative effects thresholds, it must be questioned whether having any fish samples above the effects threshold is appropriate. Fish tissue sample criteria proposed by EPA (2016) are not to be exceeded, therefore any exceedance is a concern. In fact, multiple species and appreciable percentages of cyprinid fish show elevated tissue concentrations relative to the EPA (2016) tissue standard.

COMMENT NO. 161: The lentic water criterion (national) published by EPA (2016) is 1.5 µg/L. Criteria other than those proposed by EPA (EPA 2016), should be based on site-specific data versus laboratory data. EPA language reads: "The fish egg (or ripe ovary) Se criterion of 15.1 mg/kg dw supersedes (i.e., is given priority over) the Se criteria for muscle or whole-body tissue and for surface water concentrations." EPA's intent is that site-specific adjustments are allowed; however, they should only be based on site-specific data. The data used by USGS in their model Presser and Naftz (2020) did not incorporate site-specific data, with the exception of Kd values. Additionally, assumptions about the bioavailability of Se as inputs to the USGS model Presser and Naftz (2020) were made simply as model-fitting or sensitivity analyses, which were not supported by actual bioavailability measures.

RESPONSE: With respect to EPA guidance and the priority of fish tissue vs. water column concentrations, EPA (2016) indicates that a hierarchy suggested by the commenter should be applied—except under non-steady state loading conditions. Page xvi of the EPA (2016) guidance specifically states (bold added

below for emphasis), "For purposes of this document EPA defines "new inputs" as new activities resulting in the release of selenium into a lentic or lotic aquatic system. New inputs will likely result in a greater concentration of selenium in the food web and a relatively slow increase in the selenium concentration in fish until the new selenium release achieves a quasi- "steady-state" balance in the aquatic system. EPA estimates that the concentration of selenium in fish tissue will not reach steady state for several months in lotic systems and longer time periods (e.g., 2 to 3 years) in lentic systems. Achievement of steady state in an aquatic system also depends on the hydrodynamics of the aquatic system, (particularly reservoirs with multiple riverine inputs), the location of the selenium input and the particular food web. EPA expects the time needed to achieve steady state with new or increased selenium inputs to be site-specific. **Thus, EPA recommends that fish tissue criterion elements <u>not</u> take precedence over the water column criterion elements until the aquatic system achieves steady state**. In the interim, EPA recommends sampling and using site-specific data to determine steady state in the receiving water to gain a better understanding of the selenium bioaccumulation dynamics in a given system." So, in this case, the commenter is misinterpreting EPA (2016) guidance and tissue should not supersede water until the receiving waterbody is in steady state.

As for using site-specific data for criteria determination, EPA (2016) indicates the greatest reduction in uncertainty when translating a selenium fish tissue concentration to a water column concentration is achieved by collecting temporally and spatially coincident site-specific partitioning (Kd) data. This was done in model development by USGS (using multiple years of data), and was carried forward into criteria development by the department. There were a wide range of measured Kd, and consequently the department used both the 50th and 75th percentile in criterion development, assumed a bioavailability calibration fraction of 45 percent and 60 percent, and two different protective tissue endpoints to derive the criterion. Each of these assumptions result in a proposed criterion of 0.8 µg/L.

Site-specific TTFs were not used due to data limitations identified in Presser and Naftz (2020). Moreover, several reviews by SeTSC members provide conflicting thoughts about the use of site-specific TTFs. For example, DeForest (2020) argues that TTFs are overestimated according to site data and, therefore, the USGS model overpredicts fish tissue concentrations. Discussions by the Ktunaxa Nation (2020) citing Thorley (2020) suggest TTFs are temporally variable and use values similar to those selected by the USGS (with assumed bioavailability of 60 percent). Given these contrasting recommendations, along with the department's knowledge that egg/ovary data from fish already exceed EPA (2016) tissue recommendations under current water quality conditions, and knowledge that certain fish species (e.g., burbot and red shiner) have even higher tissue concentrations, the modeling approach and recommended criterion are appropriate and justified.

<u>COMMENT NO. 162</u>: The DeForest (2020) review found through a series of model validation steps, a range of predicted fish tissue concentrations from the model were developed and compared to empirical data for fish tissue. Deforest (2020) found that even when considering site-specific enrichment factors, summary statistics, and site-specific invertebrate TTFs, the USGS model predicts muscle and

whole-body selenium concentrations that, on average, are a factor of 2.9 greater than observed.

RESPONSE: DeForest (2020) completes a quasi-model validation exercise with available fish tissue data oriented at central tendencies (caveats discussed later), but fails to provide a compelling argument that can counter the preponderance of evidence suggesting impacts are already occurring to fish in Lake Koocanusa. As noted in COMMENT NO. 9, he concludes the U.S. Environmental Protection Agency's (US EPA's) surface water quality criterion of 1.5 µg/L for lentic water bodies is fully protective of fish and the aquatic community in Koocanusa Reservoir. However, as indicated in his alternative bioaccumulation model calculations (see Table 2 of his comments), three of the eight scenarios he presents reflecting different diets, food web sensitivities, and assumptions of TTFs and Kds based on his own judgment, suggest the criterion could be as low as 1.1 µg/L. So, the conclusion that the EPA (2016) lentic criterion is fully protective of Lake Koocanusa is not supported by his calculations.

Furthermore, the use of mean measured fish tissue concentrations and standard deviations for developing predicted to observed ratios to make the point that the USGS model is overpredicting fish tissue data is disingenuous (e.g., Figure 19 and Table 4). More realistically, the computations should be compared to maximum fish tissue data, as the EPA (2016) tissue threshold reflects a "not to exceed" criterion and the department is interested in protecting all fish from impacts in the reservoir. Comparison to the mean and standard deviation neglects the most important data in the entire tissue distribution, the upper 15.9 percent of the distribution, and comparisons to data in that region are more appropriate in validation of the model.

Lastly, DeForest (2020) surprisingly chooses to overlook certain fish tissue data altogether. This is despite the fact that several cyprinid species (e.g., redside shiner, peamouth chub) already have elevated tissue concentrations above EPA (2016) egg/ovary criteria, and in multiple samples. The data were dismissible in his opinion because of collection methods and were further marginalized as species less sensitive to selenium in non-peer-reviewed studies.

COMMENT NO. 163: The proposed standard retains the exact same fish tissue criteria as the federal guidelines, in effect acknowledging the protective nature of one portion of the federal guideline while making a 50 percent reduction in the other portion. This departure from federal guidelines is internally inconsistent and not explained.

RESPONSE: EPA (2016) indicate selenium bioaccumulation potential depends on biogeochemical factors that are unique to a particular aquatic system and uncertainty in the translation of the egg-ovary criterion element to the water column element can be reduced by deriving a site-specific criterion that uses site-specific selenium data and information on food web dynamics and a biological assessment of the aquatic system. It is important to note that the 8.5 mg/kg dw proposed in this standard was also used in modeling that led to the proposed site-specific water column standard.

COMMENT NO. 164: We support the use of the 8.5 mg/kg dw whole-body

fish tissue as appropriately conservative; we do not, however, support the use of generic TTFs used in the model. Site-specific TTFs should be used to decrease uncertainty in the model.

RESPONSE: The board acknowledges the comment. See also, the response to COMMENT NOs. 162, 163, 165, and 169.

COMMENT NO. 165: The modeling that was done is basically a sensitivity analysis rather than a predictive exercise, and this model significantly overpredicts selenium concentrations in the observed fish tissue.

RESPONSE: It is unclear whether this comment pertains to the Monte Carlo ecosystem modeling done by the U.S. Geological Survey in Jenni et al. (2017), which is indeed a combination of a sensitivity and uncertainty analysis, follow-up work by USGS (Presser and Naftz, 2020), or the criteria derivation done by the department (DEQ, 2020). The department's work in standards setting directly predicts protective water column concentrations based on assumed whole body guidelines, model partition coefficient (Kd), bioavailability, and trophic transfer factor (TTF). Each of these requires a user decision/input. The department relied on recommendations from the bi-national SeTSC for each. The department also relied on recommendations from the USGS to consider a single TTF for fish, aquatic insects, and zooplankton for standard setting, reflecting a broader understanding and central tendency from the literature. Three different scenarios were considered by the department for sensitive food web pathways and diets, which is hardly sensitizing input variables. A fourth considered different tissue thresholds [8.5 vs. 5.6 mg/kg dry weight (dw)], bioavailability factors (60 percent vs. 45 percent, each of which increase the criterion over what would typically be computed using 100 percent), and Kd values (75th vs 50th percentile). Very similar levels of protective water column standards are computed in all scenarios. See also, response to COMMENT NOs. 160 and 161.

COMMENT NO. 166: The model is not predicting what is actually being measured in the fish in Lake Koocanusa and not validated to fish tissue.

RESPONSE: The model calibrates a peer reviewed global model to local conditions by modifying the global model parameter values (in this case, the TTFs through the bioavailability factor and then using site-specific Kd data based on repeat field-observations over multiple years). The Lake Koocanusa model overpredicted Se concentrations in zooplankton and invertebrates, relative to the concentrations seen in Lake Koocanusa. Thus, the global model was calibrated to improve predictions on the local level, using a 60 percent bioavailability scenario to address unmeasured local factors causing over prediction. While the current model is not scientifically validated to fish tissue, the 60 percent bioavailability model has been calibrated to be accurate to local conditions informed by the zooplankton and macroinvertebrate tissue concentrations as well as the Kd samples. The USGS determined the fish tissue data was not appropriate to use in the modeling effort. However, there is greater certainty in the TTF used for fish (1.1) than observed variability in Kd. No global average Kd exists in the literature, a wide range was measured in situ, and it is known to be affected by hydrologic factors such as residence time and selenium speciation. In the global dataset fish TTFs vary far less

across ecosystems (0.52 - 1.6) than do Kds (107 - 21,500). Thus, for the Lake Koocanusa model, the USGS applied a modeling approach utilizing all observed pairs of dissolved: particulate Se (Kd) to create scenarios accounting for the full range of the observed dataset (full uncertainty). See also, the responses to COMMENT NOs. 162 and 167.

COMMENT NO. 167: The model consistently overestimated Se concentrations in fish tissue, even in the most conservative model scenario and using site-specific inputs. A generic multi-step modeling approach has too much uncertainty to support, by itself and without validation, recommendations for a site-specific, water-based selenium standard for Lake Koocanusa.

RESPONSE: See response to COMMENT NO.162. The commenter implies that SeTSC comments provided by DeForest (2020), representing Teck, conclude that the USGS model (Presser and Naftz, 2020) overestimates fish tissue concentrations and therefore was not validated. However, there is considerable belief by a cross-section of scientists in both Canada and the U.S. that the approach and recommendations by the department are appropriate and valid (see comments by other SeTSC members). Conservative model scenarios with respect to protecting fishery resources in Lake Koocanusa indicate the proposed criterion could even be lower. At a very basic level, the EPA (2016) tissue standard indicates no sample exceedances are acceptable and currently the reservoir (whose Se concentration is approximately 1 µg/L) has produced egg/ovary samples at levels above the proposed tissue standards. There have also been elevated levels of selenium found in burbot tissue downstream, a species known to be culturally important and, may be among the most selenium sensitive fish species with populations which have been declining since 1990. In this regard, a level of protection slightly under the existing concentration of the lake is recommended and the 0.8 µg/L proposed criterion is an appropriate recommendation in the face of uncertainty.

COMMENT NO. 168: We believe the proposed criteria has been developed using overly conservative assumptions, not supported by site-specific data.

RESPONSE: See response to COMMENT NO. 165.

COMMENT NO. 169: TTF values reported for the original Presser and Luoma (2010) model were based on previous research and were not specific to Lake Koocanusa. Upon reassessment of the model, it was determined that the TTF values assumed in the model were significantly higher than site-specific TTFs (e.g., the site-specific median value for zooplankton was determined to be 0.52, whereas the model assumed a value of 1.5). Validation of the model revealed that even when using site-specific TTF values, the model consistently overestimates Se concentrations in fish tissue. This fact may be due to Kd values that overestimated Se exposure in Lake Koocanusa or perhaps Se exposures by fish were overestimated (e.g., the default whole-body fish TTF is "too high"). Even when using site-specific Kd and TTF values, the model predicted muscle and whole-body Se concentrations that, on average, were a factor of 2.9 greater than what was observed. Checking model predictions of fish tissue Se concentrations against the

reported data from the site in question (in this case, Lake Koocanusa) is critical.

RESPONSE: See responses to COMMENT NOs. 162, 165, and 167. The starting point for the bioaccumulation modeling work is a scientifically robust global model (Presser and Luoma, 2010) and associated global average model coefficients. For reasons provided in Presser and Naftz (2020), there were not sufficient data to develop empirically derived TTFs and we believe the commenter does not accurately represent the limitations of the TTFs and quasi-model validation exercise discussed in DeForest (2020). Nonetheless, we recognize it is common to calibrate a global model to local conditions by modifying the global model parameter values (in this case, the TTFs). Given that the model overpredicted Se concentrations in zooplankton and invertebrates relative to the concentrations seen in Lake Koocanusa, the global model was calibrated by Presser and Naftz (2020) to improve predictions on the local level, using a 60 percent bioavailability scenario to address unmeasured local factors causing over-prediction.

Furthermore, for reasons defined in Presser and Naftz (2020), the calculation of empirically derived TTFs and validation in fish tissue could not be completed. Yet, two SeTSC performed this exercise with TTF results ranging from 1.1 - 1.2 for aquatic insects. These values are very close to the USGS aquatic insect TTF with the 60 percent bioavailability correction (~1.68) and the 45 percent bioavailability correction (~1.26). The same members of the SeTSC calculated zooplankton TTFs which ranged from 0.58-0.85. These are very close to the zooplankton TTF with the 60 percent bioavailability correction (~0.9) and the 45 percent bioavailability correction (0.675). The department took a cautionary approach in the consideration of these site-specific TTFs due to some of the data coming from the Elk River (a lotic system) which would presumably result in a lower TTF as well as the clear reasons defined in Presser and Naftz (2020) for why site-specific TTFs could not be calculated. The TTFs used for the modeling effort are the best available science and representative of local conditions.

COMMENT NO. 170: Site-specific BAFs illustrate lentic water criteria is adequately protective. Using site-specific data for Lake Koocanusa, it is clear that calculated site-specific criteria using a BAF approach can result in a significant proportion of values greater than the MTDEQ (2020) proposed value of 0.8 µg/L.

RESPONSE: We disagree that site-specific BAFs for Lake Koocanusa indicate the national lentic water quality criteria of 1.5 µg/L is fully protective. First, as noted by EPA (2016) when using site-specific BAFs, "Because of uncertainties associated with the BAF approach, EPA does not recommend developing BAFs from data extrapolated from different sites or across large spatial scales." As such, BAFs are to be calculated from specific spatial locations with paired fish and water samples, as was attempted by the commenter in delineating Zones in the reservoir. However, per recommendations of the SeTSC, all regions of the reservoir must be protected, which includes the most sensitive areas. In this instance Zone A delineated by the commenter is clearly the most sensitive (reasons not known), and computations indicate the proposed value by the department of 0.8 µg/L is within an appropriate range. For example, BAF predicted criteria from Table 1 provided by the commenter for both egg/ovary and whole-body samples (which are hierarchically more reliable than muscle criteria) suggest the criterion to protect Zone A of the

reservoir could be as low as 0.56 to 0.65 µg/L. Therefore, in order to maintain the recommendation by the SeTSC, it is noted that the value proposed by the department is not that different from that identified using BAFs for Zone A in the comment.

COMMENT NO. 171: Does the modeling and criteria used for the proposed standard consider that the characteristics of Lake Koocanusa is far different than the characteristics of a natural lake?

RESPONSE: The model is agnostic to whether it is applied to a lake or a reservoir, and relies solely on selection of the Kd coefficient and TTFs. Notably, Kd coefficients in lakes tend to be higher than rivers; however, few comparisons have been made individually between lakes, reservoirs, and ponds (collectively referred to as lentic waterbodies). Anecdotally, EPA (2016) has a Kd compilation in Appendix H of their document and from inspection of those data, it is difficult to parse out a difference between any of the lentic (lakes, reservoirs, and pond) waterbodies. Clearly there is a difference between lentic (non-flowing) and lotic (river-like) Kd. This difference is reflected in EPA (2016) national criterion recommendations. The Kd coefficients for Lake Koocanusa were made site-specific, which is the best possible representation.

COMMENT NO. 172: A different standard exists for the static water of lakes than for a flowing stream. I understand this, but I also know that Lake Koocanusa is not a standard static body of water. Lake Koocanusa was designed for an annual vertical fluctuation of about 100 feet in elevation, with a considerable amount of lake bottom becoming mucky and then dusty dry ground as the reservoir level drops during late summer, autumn, winter and early spring. So, in addition to the normal current of the Kootenai River running downstream through the reservoir all year long, the reservoir is drained and refilled each spring with fresh snowmelt. So, the selenium does not continually build up in, or be added to, the same water.

RESPONSE: Lake Koocanusa by definition is a reservoir and has a mean water residence time of approximately 9 months (Easthouse, 2013). It is no doubt a lentic system and behaves far more like a lake than a river, with bioaccumulation processes characteristic of lentic systems. See also, responses to COMMENT NOs. 153, 171, and 173.

COMMENT NO. 173: Based on the past 10 years of data collection, what does the model predict for the next ten years? Does the model differ if only data from 2014 to the present is used? Does the model differ if only data during spring runoff is used as opposed to data from season of low flow?

RESPONSE: The model does not predict concentrations through time. It is a bioaccumulation or trophic transfer model that considers only a single dissolved and particulate selenium concentration enrichment factor (Kd), along with trophic transfer factors. Based on site-specific Kd data measured by USGS from 2015 through 2019 (including samples by BC-ENV/Teck), selenium enrichment appears to potentially be increasing. Mean Kd factors for samples across all years are trending upward (visual inspection only), noting interannual Kd is variable due to time of year (runoff vs. freshet as suggested by the reviewer) as well as variation in reservoir primary

productivity, hydrodynamics, reservoir operation, and seasonal water temperature variation.

COMMENT NO. 174: Does the modeling consider the large fluctuation of selenium in the Elk River between the runoff season and the season with low flows? (Technical Support Doc -Figure 1-7. Selenium loads from the Kootenay River and Elk River).

RESPONSE: The variability in selenium loadings pointed out by the commenter is reflected in enrichment factors or partitioning coefficients (Kd values) used in the modeling. Kds vary seasonally as a function of runoff and controlling reservoir factors such as biogeochemical processing. Since Lake Koocanusa is a long linear reservoir, with a hydraulic residence time on the order of three quarters of a year, it is believed it partitions selenium uniquely compared to other waterbodies. Therefore, site-specific Kd values were acquired and used in the model. Those ultimately selected for use in the criteria development were near the middle (50th percentile) and upper quartile (75th percentile) which were used to reflect average and moderate bioaccumulation potentials.

COMMENT NO. 175: The 0.8 µg/L selected for Lake Koocanusa is within the range recommended by selenium experts.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 176: I am opposed to the proposal for a selenium standard of 0.8 µg/L for Lake Koocanusa because I do not believe that the facts and science of the situation warrant a selenium standard more stringent than the national EPA standard of 1.5 µg/L.

RESPONSE: The board does not agree with the commenter's assertion, but acknowledges the comment.

COMMENT NO. 177: The number 0.8 µg/L is not defensible.

RESPONSE: The department followed the procedures in EPA (2016) for developing site-specific selenium criteria. Data were collected under established rigorous scientific protocols. Modeling was based on published, peer-reviewed work—considered the state of the science—and bioaccumulation modeling was completed by the U.S. Geological Survey following their rigorous scientific procedures. The department reviewed and analyzed recommendations from the SeTSC on model inputs. This included a detailed analysis and review of each model input recommendation received. The department ran subsequent model scenarios based upon the SeTSC recommendations.

DEQ (2020) says "As previously stated, the goal of this work was to co-develop a site-specific water column standard for Lake Koocanusa. A challenge of that work has been the differing protection goals between BC-ENV and DEQ." To address this challenge, the department followed two routes: one that worked collaboratively with BC to meet the more stringent regulatory requirements in BC, and a second route that considered the less stringent EPA-recommended whole-body selenium threshold of 8.5 mg/kg. Per the first route, the department considered the SeTSC recommendations (both oral and written) to develop the

scenarios with model inputs displayed in Table 5-1 and Table 5-2 of DEQ (2020). Route one comprised three scenarios developed in collaboration with BC-ENV, and among those the department selected scenario 3 (see Table 5-1; DEQ, 2020) which included a whole-body tissue threshold of 5.6 mg/kg dw, the trophic fish model, 100 percent aquatic insects, 45 percent bioavailability, and the median Kd percentile. This resulted in 0.8 µg/L.

For the second route, the department considered the EPA-recommended whole-body tissue threshold of 8.5 mg/kg with the same trophic fish model at 100 percent aquatic insects, retained the USGS proposed 60 percent bioavailability, and selected 75th percentile of the Kd distribution.

Both of these different approaches arrived at a protective selenium water column criterion of 0.8 µg/L, which meets the protection goals previously defined by the SeTSC, ensures protection of the beneficial use, and strikes a balance between protection of the fish assemblages in Lake Koocanusa, the downstream Kootenai River, and current conditions.

COMMENT NO. 178: The value of 0.8 µg/L makes no scientific sense, as selenium levels in Lake Koocanusa are stable, and the current level of 1.0 µg/L is not causing fish tissue concentrations anywhere close to high enough to impair reproduction.

RESPONSE: Repeat samples and multiple fish species in the reservoir already exceed the EPA (2016) tissue recommendation. Additionally, the department followed a rigorous scientific process in developing the proposed standard for Lake Koocanusa, using EPA recommended protocols. At current concentrations, some fish show selenium levels in their fish tissue above the proposed standard. This is cause of concern and suggests reproductive impairment may already be occurring.

COMMENT NO. 179: I understand this would be the harshest standard for selenium in the world. If 0.8 µg/L is necessary for Lake Koocanusa, why would it not apply to every water body in Montana. Is this site-specific standard business simply a way to divide and conquer? Is this fair to my constituents?

RESPONSE: The proposed site-specific selenium criteria is based on the ecosystem modeling of Lake Koocanusa, and thus would not apply to other lentic or lotic waterbodies in Montana. On November 29, 2018, EPA signed a proposed rule to revise the current federal CWA selenium water quality criterion applicable to certain fresh waters of California. This rule, Establishment of a Numeric Criterion for Selenium for the State of California, is being proposed to ensure that the criterion is set at a level that protects aquatic life and aquatic-dependent wildlife, and includes 0.2 µg/L dissolved selenium for San Francisco Bay. Thus, the proposed site-specific criteria for Lake Koocanusa is not the most restrictive proposed standard in the country and is supported by the procedures in EPA (2016) for developing site-specific selenium criteria, the data were collected under established rigorous scientific protocols, and modeling was based on published, peer-reviewed work. See also, the responses to COMMENT NOs. 13 and 177.

COMMENT NO. 180: I expected the regulation to be reduced from the

Montana standard of 5 micrograms per liter, and I expected it to be reduced to the EPA recommended level of 1.5 micrograms per liter. I was shocked when instead it was proposed at .8 micrograms per liter. What samplings or data make this necessary?

RESPONSE: The board acknowledges the comment. See responses to COMMENT NOs. 9, 161, and 166.

COMMENT NO. 181: Presser and Naftz (2020) provided over 174 different possibilities of potential criteria values, 87 from each model. Despite the conservative assumptions of the models, both yielded median predicted water criteria greater than 0.8 µg/L. It appears the choice to pursue a value of 0.8 µg/L came down to two different scenarios. It appears that the water criterion proposed was a choice not necessarily driven by the outcome of a significant modeling effort.

RESPONSE: As described in COMMENT NO. 177, two scenarios were considered by the department both of which resulted in the 0.8 µg/L. The department selected the upper 25 percent of the distribution, matching the 75th percentile of the Kd distribution for the scenario including 8.5 mg/kg whole body as the tissue guideline. A different set of assumptions with a more conservative tissue guideline and less conservative Kd (50th percentile) and bioavailability fractions were also considered. As noted by the commenter, the cumulative frequency distribution of the USGS modeled water criteria were not considered the criteria development. However, the board notes the median value of that distribution, as suggested by the commenter, would be an incorrect percentile to choose for protectiveness anyway. EPA (2016), in developing their national criteria, selected the 20 percent percentile of the distribution of median water column values as the statistical cut-off to ensure adequate protection. Should a similar approach be used with the USGS models, a very similar criterion to the department value would be arrived at for the two most sensitive food webs (e.g., 0.83 µg/L for the IFM and 0.75 µg/L TFM with 100 percent aquatic insect diet and 60 percent bioavailability). Thus, the approach is similar to the department's recommendations, and meets the protection goals previously defined by the SeTSC, to protect the beneficial use for Lake Koocanusa, and protect downstream water quality.

COMMENT NO. 182: DEQ unexplainably varies the use of model inputs under different scenarios. For example, when DEQ uses the overly conservative fish tissue threshold of 5.6 mg/kg dry weight, they use the Subcommittee recommended enrichment factor and a site-specific bioavailability factor, but when DEQ uses the more appropriate fish tissue threshold of 8.5 mg/kg., the enrichment and bioavailability factors are increased without explanation.

RESPONSE: See response to COMMENT NO. 177.

COMMENT NO. 183: The State of Montana has full legal authority to set these standards. In fact, Montana is required under section 303(c)(2)(B) of the federal Clean Water Act (CWA) to establish water quality criteria for toxic pollutants, including selenium. The CWA authorizes states to adopt numeric values for toxins like selenium that reflect site-specific conditions. Furthermore, 2016 EPA guidance recommends that states adopt site-specific selenium standards based on local

environmental conditions. This is just what DEQ has done.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 184: We recommend using the term "elements" or "criterion elements" in the rule language to clarify that the fish tissue and water column criterion elements are separate elements of the single selenium criterion rather than individual water quality criteria.

RESPONSE: The board does not see a need to change the proposed language of the rule. The rule is plainly written, consistent with other Montana rules, and clearly states in the introductory paragraph that the numeric selenium standard is expressed as both fish tissue and water quality concentrations. It explains which components take precedent over the others and under what circumstances. All of these descriptions are consistent with EPA's national recommendations for selenium.

COMMENT NO. 185: We suggest the state consider whether it would be beneficial to clarify whether under the "steady state" definition that "activities" includes only anthropogenic activities.

RESPONSE: The board considers the definition to be correctly worded as written, and does not consider it appropriate to limit "activities" to only anthropogenic ones. If, for example, a nonanthropogenic selenium increase was documented and Lake Koocanusa was in steady state at the time, the nonanthropogenic change could alter the lake from steady to non-steady state. Regardless of the fact that the change was nonanthropogenic, the effect on the fish tissue standard would be the same as if the source were anthropogenic: fish tissue selenium concentrations would be transient, and the water column and fish tissue standards would all apply simultaneously, as described in the rule.

COMMENT NO. 186: We recommend adopting the intermittent exposure water column criterion element to protect Lake Koocanusa and the Kootenai River if, in the future, intermittent discharges occur into those waters. If Montana chooses to proceed without this element, please provide an explanation for how the state intends to implement the selenium criterion to protect the applicable designated uses without this element.

RESPONSE: The intermittent exposure element is unnecessary because MPDES 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.

COMMENT NO. 187: We recommend states/tribes adopt a selenium criterion that clearly indicates the egg-ovary criterion element supersedes any other criterion element because egg and ovarian tissue is the location of selenium toxicity and their selenium concentrations are most strongly correlated with larval deformity and mortality. The egg-ovary criterion element served as the basis for deriving all the other criterion elements.

RESPONSE: The board agrees with the comment, and notes that the department drafted the proposed rule to reflect the importance of the egg-ovary criterion. In NEW RULE I(6), the rule clearly states that the egg-ovary criterion supersedes both the muscle/whole body and water column standards, so long as egg-ovary data are actually available and the aquatic ecosystem is in steady state. No change is made to the proposed language of the rule in response to this comment.

COMMENT NO. 188: We recommend the whole-body/muscle criterion element supersedes the water column criterion elements because whole-body/muscle concentrations provide a more robust and direct indication of potential selenium effects in fish than water concentrations. We suggest adding rule text specifying that muscle or whole-body criterion elements also supersede the water column criterion element when the aquatic ecosystem is in steady state.

RESPONSE: The board agrees that NEW RULE I(6) could be better worded to clarify the hierarchical relationship among different fish tissue standards and the water column standards. Section (6) will have the following sentence added at the end: "When fish egg/ovary samples are unavailable and the aquatic ecosystem is in steady state, fish muscle or whole-body standards supersede the water column standards in (7)."

COMMENT NO. 189: We recommend adding rule text specifying the duration and frequency for the fish tissue elements. For the fish tissue elements, EPA's recommended duration and frequency is an instantaneous measurement, not to be exceeded.

RESPONSE: The board agrees with the comment; therefore, NEW RULE I(6) will be modified as follows: "Fish tissue standards will be instantaneous measurements not to be exceeded." Moreover, language clarifying the number of samples required will be added to the rule: "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 of five individuals from the same species." Additional details on assessment will be defined in the assessment methodology, see response to COMMENT NO. 53.

COMMENT NO. 190: The statement of reasonable necessity for NEW RULE I indicates a new nondegradation trigger value for selenium of 0.02 µg/L and footnote applying only to NEW RULE I will be incorporated into DEQ-7 as part of the current triennial review (anticipated completion in 2021). Based on this language and confirmation from DEQ, our understanding is that this change is not part of the current public comment period or rulemaking and will be open for public comment as part of the triennial review rulemaking.

RESPONSE: The comment is correct. The department plans to make the described change to Department Circular DEQ-7 during its current, ongoing triennial review, which will subject to public review and comment.

COMMENT NO. 191: Should Montana fail to establish a protective selenium standard at the international border, and should British Columbia's mine waste

continue to pass through Montana and into Idaho, then the State of Montana will be exposed to a claim of Clean Water Act liability by Idaho interests, as well as other community and Tribal interests both in Montana and Idaho.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 192: Failure by the State of Montana to establish a protective selenium standard at the international border exposes the state to a claim of Endangered Species Act liability by downstream interests in Idaho, where Kootenai River white sturgeon remain a listed species. Best available science indicates fish tissue concentrations of selenium already are having deleterious physiological and morphological effects in white sturgeon burbot, mountain whitefish, and freshwater mussels.

RESPONSE: The board acknowledges the comment.

COMMENT NO. 193: The department asserts Montana would or could somehow be financially liable to the state of Idaho, be required to treat water in Lake Koocanusa or the Kootenai River before it reaches Idaho, or otherwise be held accountable for selenium levels coming into Lake Koocanusa from Canada. But DEQ stated that there are no permitted sources of selenium in the watershed to regulate and it does not appear that Idaho considers Montana as the source of selenium. Therefore, it is not clear how this causes liability for Montana. This heightens the concern that the rulemaking is being pursued too quickly, perhaps prompted by fears and assumptions that require further dialogue and better understanding.

RESPONSE: Idaho and EPA can establish a waste load allocation for the selenium in the future. In that situation, Montana's responsibility is to take steps to ensure that the source of selenium that is impairing Idaho's waters is decreased to the point where those waters are not impaired. The source of selenium, as both Idaho and the department have pointed out, is the Elk River watershed in British Columbia, Canada. Additionally, future permitted sources in Montana may be required to incorporate special limits or conditions to avoid impairment to aquatic life downstream in Idaho. See ARM 17.30.1383. See response to COMMENT NO. 61.

COMMENT NO. 194: DEQ has also indicated a need to enact the strict standard, otherwise the State of Montana may be liable to the State of Idaho for selenium pollution. There appears to be no legal basis for the statement.

RESPONSE: See response to COMMENT NO. 193.

COMMENT NO. 195: Neither EPA (2016) or MTDEQ (2020) establish or define what constitutes "steady state." MTDEQ (2020) defers to Presser and Naftz (2020) who state, "This upward trend has created a non-steady state for dissolved selenium in the lake that the ecosystem is responding to throughout this 35-year period." MTDEQ is moving toward site-specific criteria even though the EPA recommends data collection and understanding the problem when the system is in "non-steady state."

RESPONSE: The board disagrees with the comment. In EPA (2016) on page xvi, pages 101-102, and elsewhere, EPA describes the conditions that will

need to be achieved in order to reach selenium steady state in an aquatic ecosystem. In those same paragraphs, EPA essentially describes what non-steady state is. Presser and Naftz (2020) provide a technical explanation why Lake Koocanusa is not in steady state. Regarding the proposed rule, it contains a clear, plainly written definition for steady state corresponding to EPA's description. The rule states the ecosystem is not currently in steady state, and provides for a re-evaluation of that status every three years**.** See also, response to COMMENT NO. 161.

COMMENT NO. 196: DEQ has portrayed the need for the rule as based on a "concern" that the current standard is not protective and on "uncertainty" of what standard is protective. Neither provides a legal basis for setting a water quality standard.

RESPONSE: Water quality standards are not established based on "concern" or "uncertainty." With designated authority to establish water quality standards under the Clean Water Act and in accordance with 40 CFR §131.11(a)(1), the department adopts water quality criteria that protect the designated use. Such criteria must be based on sound scientific rationale and must contain parameters or constituents to protect the designated use. It is necessary to adopt the proposed numeric selenium standards to incorporate the best available science for selenium toxicity and protect selenium-sensitive aquatic life in Lake Koocanusa and the Kootenai River. The proposed fish tissue and water column standards for the mainstem Kootenai River are based on current EPA 304(a) criteria for lotic (flowing) waters. The proposed fish tissue and water column standards for Lake Koocanusa are based on EPA 304(a) fish tissue criteria, and site-specific water column criteria derived following procedures set forth by EPA in the 304(a) guidance.

COMMENT NO. 197: The proposed rule states the EPA guidance "includes a recommendation that states and tribes develop site-specific selenium standards, whenever possible, due to the local environmental factors affecting selenium bioaccumulation in aquatic ecosystems." This language, specifically "whenever possible" is not found in the EPA guidance.

RESPONSE: The phrase "whenever possible" is in DEQ's Reason Statement for proposed New Rule I and is not in the rule language.

COMMENT NO.198: There is not a straight line between environmental selenium concentrations and toxicity to fish; it depends on the various conditions of the ecosystem. Therefore, while water concentrations are easier to obtain than fish tissue concentrations, it is fish tissue concentrations that indicate whether a system is selenium-impaired. Here, Montana Department of Environmental Quality (DEQ) appears to be promoting the use of a (very low) water standard for Lake Koocanusa based on the erroneous perception that the system's selenium conditions are not at equilibrium and are worsening. However, the data show that the (1) water, (2) sediment, and (3) fish tissue selenium values are all stable. Therefore, insofar as Montana proceeds with adopting a new selenium management approach for Lake Koocanusa, a more appropriate approach for this non-impaired system is a tissue-based approach, with a water number used only as a trigger for additional fish tissue

sampling, the approach recommended in the EPA's 2016 national water criteria for selenium.

RESPONSE: The department did not derive the proposed standard based on the perception that the system is in steady-state. Rather, the department defined steady state and clarified that at present the system is not considered in steady state, in line with EPA (2016) characterizations. The proposed rule follows guidance from EPA, in that the fish tissue takes precedence over water column only when the system is in steady state. Language from EPA (2016) says, "EPA recommends that fish tissue criterion elements not take precedence over the water column criterion elements until the aquatic system achieves steady state" (see also the response to COMMENT NO. 161). While the data do show that water concentrations are relatively stable, the department cannot ignore the conclusions in Presser and Naftz (2020) that the cross-sectional area of concentrations greater than 1 µg/L has been increasing. Moreover, some fish tissue data (rainbow trout, westslope cutthroat trout, longnose sucker) show a continued increase of selenium found in fish tissue from 2013-2019 (see slide 13 DEQ Presentation to BER 9/24/20). See the responses to COMMENT NOs. 151 through 154.

COMMENT NO. 199: We must show harm to change the status quo, the six years of data to establish a trend. This caused me concern, as I proposed that the current levels are actually traditional levels and we have no evidence of the contrary.

RESPONSE: The department determines whether the state's beneficial uses are harmed through our Monitoring and Assessment programs and development of our Integrated Report. Water quality standards are established not at background levels, but at concentrations to ensure protection of the beneficial use. Water quality criteria are based on data and scientific evaluation regarding the relationship between pollutant concentrations and potential environmental and human health effects. See COMMENT NOs. 129 and 149.

COMMENT NO. 200: The proposed rule is illegal. The proposed rule is more stringent than the federal guideline for the water column concentration portion, but without the required compliance with 75-5-203(2), MCA. There must be evidence in the record that the proposed standard protects public health or the environment.

RESPONSE: The board disagrees that the proposed rule is illegal because it did not comply with 75-5-203(2), MCA. EPA's 2016 selenium criterion document for freshwater contains an appendix, Appendix K. Appendix K describes methods by which site-specific selenium standards may be developed for individual waterbodies. Appendix K is discussed in twelve different locations throughout EPA's 2016 selenium document. EPA is very clear that "states and tribes may choose to adopt the results of site-specific water column translations as site-specific criteria..." Montana chose this approach.

The selenium standards in proposed NEW RULE I are not more stringent than currently recommended federal criteria. The proposed water column standard for the mainstem Kootenai River (3.1 µg/L) corresponds to the current (2016) EPA 304(a) criterion for lotic (flowing) waters. The proposed water column standard for Lake Koocanusa (0.8 µg/L) is based on EPA 304(a) fish tissue criteria and site-specific bioaccumulation modeling, following site-specific procedures set forth by

EPA in its current 304(a) guidance. The fish tissue standards in NEW RULE I include egg/ovary, muscle, and whole body, expressed as mg/kg dry weight, correspond to EPA's currently recommended 304(a) fish tissue criteria. Therefore, the proposed Kootenai River and Lake Koocanusa water column and fish tissue standards are no more stringent than currently recommended EPA 304(a) criteria because they correspond to federal standards or were developed using federally recommended site-specific procedures. Therefore, the board is not required to make written findings required by 75-5-203(2), MCA.

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Reviewed by: BOARD OF ENVIRONMENTAL REVIEW

/s/ Edward Hayes BY: */s/ Christine Deveny*
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Rule Reviewer Chair

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