



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10**

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Seattle, WA 98101

WATER  
DIVISION

September 29, 2023

Dr. Mary Anne Nelson  
Surface and Wastewater Division Administrator  
1410 N. Hilton Street  
Boise, Idaho 83706-1255

Re: EPA's Clean Water Act Action on the July 6, 2023, Submittal of Revisions to Idaho's Surface Water Quality Standards for Arsenic Human Health Criteria, and Application of Toxics Criteria (Idaho Rule Docket 58-0102-2201)

Dear Dr. Nelson:

The U.S. Environmental Protection Agency has completed its review of the new and revised water quality standards (WQS) at IDAPA 58.01.02.210 of the Idaho Administrative Code, submitted to EPA by the Idaho Department of Environmental Quality (DEQ) by letter dated July 6, 2023. Under Clean Water Act (CWA) section 303(c), 33 U.S.C. § 1313(c), and EPA's implementing regulations, states and authorized tribes must submit new and revised WQS to EPA for review and action. EPA must either approve or disapprove those WQS based on whether they are consistent with the CWA and the regulations. The details of EPA's action are outlined below and are further described in the enclosed Technical Support Document.

EPA's action applies only to waters in the state of Idaho and does not apply to waters that are within Indian country, as defined in 18 U.S.C. § 1151. Nothing in this action shall constitute an approval or disapproval of a WQS that applies to waters within Indian country. EPA, or authorized Indian Tribes, as appropriate, retain the authority to establish WQS for waters within Indian country.

**Background**

In 1992, EPA promulgated human health criteria (including criteria for arsenic) for Idaho and several other states in the National Toxics Rule (NTR). In 1994 and 1995, Idaho adopted the human health criteria (HHC) in the NTR by reference, except for arsenic, where Idaho recalculated its own arsenic criteria of 0.02 ug/L for consumption of water plus organisms and 6.2 ug/L for consumption of organisms only. In 1996 and 1997, EPA approved all of Idaho's human health criteria, including arsenic, and removed Idaho from the NTR. In 1999, Idaho revised its arsenic criteria to a criterion of 50 ug/L, which was consistent with EPA's Safe Drinking Water Act (SDWA) Maximum Contaminant Level (MCL) for arsenic at the time. EPA took no action on this revision, but under the applicable EPA regulation, the revision took effect for CWA purposes even without EPA's approval (40 CFR 131.21(c) and (e)).

Over the years, in guidance and policy documents, EPA has recommended not using MCLs as surface water quality criteria, especially where routes of exposure other than drinking water are of concern (e.g., fish consumption), and where consideration of available treatment technology, costs, or availability of analytical methodologies has resulted in an MCL that is less protective than a maximum contaminant

level goal (MCLG).<sup>1</sup> In 2010, Idaho revised its arsenic criteria to 10 ug/L, consistent with EPA's revised (and current) SDWA MCL for arsenic; EPA approved Idaho's revision in June of that year.

In June 2015, Northwest Environmental Advocates (NWEA) filed a complaint in the U.S. District Court for the District of Oregon. The complaint alleged that EPA's approval of Idaho's 10 ug/L arsenic criterion was arbitrary and capricious, an abuse of discretion, and contrary to law. In May 2016, EPA and NWEA entered into a Consent Decree (subsequently modified to extend deadlines) in which EPA agreed to reconsider EPA's 2010 approval of Idaho's arsenic HHC. Upon reconsideration, EPA disapproved Idaho's arsenic HHC in September 2016. Subsequently, in 2018 Idaho initiated rulemaking to update the arsenic HHC in response to EPA's September 2016 disapproval. Under the Consent Decree, EPA must either approve the State's arsenic HHC or propose federal arsenic HHC by November 15, 2023. If EPA proposes federal arsenic HHC, EPA must finalize the rule by November 2024.

### **Summary of EPA's Action**

The WQS revisions submitted to EPA for CWA review and action include revised numeric arsenic human health criteria for protection of recreation uses and domestic water supply (DWS) use, revised frequency and duration components for human health toxics criteria, and new provisions for the application of the fish tissue element of the arsenic criterion to protect waters designated for recreation uses.

In addition to these WQS revisions, the submittal package includes non-substantive clarifications at IDAPA 58.01.02.210.01 and 210.01.b, and changes to headings in Table 2.

Pursuant to EPA's authority under CWA section 303(c) and the implementing regulations at 40 CFR Part 131, EPA is approving the following provisions at IDAPA 58.01.02.210 as new or revised WQS, with the exceptions noted. Please refer to the enclosed Technical Support Document for the rationales for EPA's actions.

- Non-substantive clarification at IDAPA 58.01.02.210.01 and 210.01.b that the numeric toxics criteria for metals for the protection of aquatic life and human health are expressed as a dissolved fraction unless otherwise noted, and changes to headings in Table 2 indicating the numeric criteria are expressed as µg/L, unless otherwise specified;
- Revised numeric human health criteria for arsenic to protect waters designated for recreation uses and DWS use at IDAPA 58.01.02.210.01.b, including all applicable footnotes;
- Revision of the frequency and duration of human health toxics criteria at IDAPA 58.01.02.210.03.d.ii;
- New provisions for the application of the fish tissue element of the arsenic criterion to protect waters designated for recreation uses at IDAPA 58.01.02.210.03.e, with the following exceptions:
  - IDAPA 58.01.02.210.03.e.i and e.ii, and the provision "the Department will evaluate all representative fish tissue data to determine compliance with this criterion element" at IDAPA 58.01.02.210.3.e.iii. EPA is not acting on these new provisions because, as discussed in the enclosed Technical Support Document, EPA has determined that these provisions are not WQS subject to EPA review and action under CWA section 303(c).
  - IDAPA 58.01.02.210.03.e.v(4). EPA is disapproving the provision to calculate bioaccumulation factors using "... other scientifically defensible method for deriving protective BAF."

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<sup>1</sup> MCLGs for all carcinogenic pollutants, including arsenic, are zero.

## Remedy to Address the Disapproval

CWA section 303(c)(3) and the federal WQS regulations at 40 CFR 131.21 state, in part, that if EPA determines that any standard is not consistent with the applicable requirements of the CWA or implementing regulation, the Agency shall notify the state or authorized tribe and specify the changes to meet the requirements. As a result of EPA's approval action described above, Idaho's WQS will now include arsenic criteria that EPA has determined to be protective of applicable designated uses. Therefore, disapproval of the clause "or other scientifically defensible method for deriving protective BAF" does not require EPA to specify any changes that Idaho must adopt to meet CWA requirements. The effect of EPA's disapproval is that the clause "... or other scientifically defensible method for deriving protective BAF" at IDAPA 58.01.02.210.03.e.v(4) is not an applicable WQS for CWA purposes. EPA recommends removing the disapproved clause from the State's WQS regulations to provide clarity as to what is in effect for CWA purposes.

In the event that Idaho seeks to use an alternative method for deriving a BAF to use in the calculation of arsenic human health criteria, Idaho must adopt the resulting criteria and submit those criteria to EPA for review and action under CWA section 303(c).

EPA appreciates the efforts your staff have dedicated to providing new protections for Idaho waters and looks forward to continuing close collaborations with Idaho DEQ.

EPA reiterates the previous comment by letter dated April 1, 2022, and urges DEQ to revise Idaho's WQS to protect tribes exercising their treaty-reserved subsistence fishing rights in Idaho, such as by adopting a subsistence fishing designated use and associated HHC, where applicable.

If you have any questions regarding this letter, please contact me at 206-553-0171 or Jason Pappani, the acting manager for the Standards and Assessment Section, at (208) 378-5756 or [pappani.jason@epa.gov](mailto:pappani.jason@epa.gov).

Sincerely,

**HANH  
SHAW**

Digitally signed by  
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Hanh Shaw, Manager  
Standards, Assessment and Watershed Management  
Branch

Enclosure: Technical Support Document

cc (e-copy): Julia Achabal, Surface Water Bureau Chief, Idaho DEQ



# Technical Support Document

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EPA's Clean Water Act Action on Idaho's  
Revised Human Health Criteria for Arsenic

Submitted on July 6, 2023

September 29, 2023

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## **I. Introduction**

This Technical Support Document provides the basis for the U.S. Environmental Protection Agency's (EPA) action under section 303(c) of the Clean Water Act (CWA), 33 U.S.C. 1313(c), and the federal water quality standards (WQS) regulations at 40 CFR Part 131, to approve certain WQS that the Idaho Department of Environmental Quality (DEQ) submitted to EPA on July 6, 2023, and to disapprove one WQS provision included in that submission.

### **A. Clean Water Act Requirements for Water Quality Standards**

The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters with an interim goal, where attainable, to achieve water quality that provides for the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water. Under section 303(c) of the CWA and federal implementing regulations at 40 CFR 131.4, states and authorized tribes<sup>2</sup> have the primary responsibility for reviewing, establishing, and revising WQS, which consist of the designated uses of a waterbody or waterbody segment, the water quality criteria necessary to protect those designated uses, and an antidegradation policy. This statutory and regulatory framework allows states and tribes to adopt appropriate designated uses (as required at 40 CFR 131.10(a)), criteria to protect those designated uses (as required at 40 CFR 131.11(a)), and an antidegradation policy to protect existing uses and high quality waters (as required at 40 CFR 131.12(a)).

States and authorized tribes are required to hold public hearings for the purpose of reviewing applicable WQS periodically but at least once every three years and, as appropriate, modify existing and adopt new standards (40 CFR 131.20). Each state or authorized tribe must follow its own legal procedures for adopting standards (40 CFR 131.5(a)(6)) and submit certification by the appropriate legal authority within the state or tribe that the WQS were duly adopted pursuant to state or tribal law (40 CFR 131.6(e)). EPA's review authority and the minimum requirements for state and tribal WQS submittals are described at 40 CFR 131.5 and 131.6, respectively.

Section 303(c) of the CWA requires states and authorized tribes to submit new or revised WQS to EPA for review and action. EPA is required to review these WQS and approve or disapprove based on whether they are consistent with the CWA and EPA's implementing regulations.

EPA considers four questions (described below) when evaluating whether a particular provision is a new or revised WQS. If all four questions are answered "yes" then the provision would likely constitute a new or revised WQS that EPA has the authority and duty to approve or disapprove under CWA section 303(c)(3).<sup>3</sup>

1. Is it a legally binding provision adopted or established pursuant to state or tribal law?
2. Does the provision address designated uses, water quality criteria (narrative or numeric) to protect designated uses, and/or antidegradation requirements for waters of the United States?

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<sup>2</sup> The term "authorized tribe" means a tribe eligible under CWA section 518(e) and 40 CFR 131.8 for treatment in a similar manner as a state (TAS) for the purpose of administering a water quality standards program.

<sup>3</sup> What is a New or Revised Water Quality Standard under 303(c)(3)? Frequently Asked Questions, EPA No. 820F12017 (Oct. 2012). Available at <https://www.epa.gov/sites/production/files/2014-11/documents/cwa303faq.pdf>

3. Does the provision express or establish the desired condition (e.g., uses, criteria) or instream level of protection (e.g., antidegradation requirements) for waters of the United States immediately or mandate how it will be expressed or established for such waters in the future?
4. Does the provision establish a new WQS or revise an existing WQS?

If EPA approves a state's WQS submission, such standard(s) is thereafter the applicable standard for CWA purposes. When EPA disapproves a state's WQS, EPA specifies any changes that are needed to assure compliance with the requirements of the CWA and federal WQS regulations and explains why the WQS is not in compliance with such requirements (40 CFR 131.21).

Finally, EPA considers non-substantive edits to existing WQS to constitute new or revised WQS that EPA has the authority to approve or disapprove under CWA section 303(c)(3). While such edits and changes do not substantively change the meaning or intent of the existing WQS, EPA believes it is reasonable to treat such edits and changes in this manner to ensure public transparency as to which provisions are applicable for CWA purposes. EPA notes that the scope of its review and action on non-substantive edits or editorial changes extend only to the non-substantive edits or changes themselves. EPA does not re-open or reconsider the underlying WQS that are the subject of the non-substantive edits or editorial changes.

## **II. The Idaho WQS Submittal**

By letter dated July 6, 2023, DEQ submitted revisions to various sections of the Idaho Water Quality Standards, IDAPA 58.01.02, to EPA for review and action under section 303(c) of the CWA.

To develop these revised WQS, under Idaho rule docket 58-0102-1801, DEQ held public negotiated rulemaking meetings pursuant to Idaho Code § 67-5220 and IDAPA 58.01.23.810-815. DEQ held thirteen public negotiated rulemaking meetings from April 2018 to November 2021. A preliminary draft rule was published on the DEQ website on December 9, 2020.

The draft rule was revised and published as a proposed rule under Idaho rule docket 58-0102-2201, and published in the March 2, 2022, issue of the Idaho Administrative Bulletin. Following a 30-day formal public comment period, the revisions were adopted as a pending rule by the Idaho Board of Environmental Quality on May 26, 2022. The pending rule was noticed in the July 6, 2022, issue of the Idaho Administrative Bulletin and finalized by the 2023 Idaho Legislature, becoming effective under Idaho Law on April 6, 2023. The revisions were certified by the Idaho Attorney General on July 5, 2023, as duly adopted pursuant to state law.

Idaho submitted the following documents in electronic format by electronic mail to EPA in accordance with the minimum requirements of a WQS submittal at 40 CFR § 131.6:

- Cover letter from Dr. Mary Anne Nelson, Idaho DEQ Surface and Wastewater Division Administrator, to Michael Szerlog, Acting Water Division Director, EPA Region 10, dated June 27, 2023
- Idaho Human Health Criteria for Arsenic Technical Justification;
- Attorney General's certification that the rules were adopted according to state law;
- April 4, 2018, Notice of Negotiated Rulemaking;
- March 2, 2022, Notice of Rulemaking - Proposed Rule announcing opening of 30-day public comment period on proposed rule;



- Negotiated Rulemaking Summary prepared pursuant to Idaho Code § 67-5220(3)(f), including the summary of public comment and Idaho’s response;
- May 26, 2022, Board Meeting Minutes;
- July 6, 2022, Notice of Rulemaking – Adoption of Pending Rule announcing adoption by the Board; and
- June 7, 2023, Omnibus Notice of Legislative Action - Summary of Action Taken on Pending, Pending Fee, Temporary, and Final Rules.

The WQS revisions submitted to EPA for review and CWA action pursuant to section 303(c) include updates to Idaho’s WQS provisions at IDAPA 58.01.02.210.

Idaho also submitted provisions or specific changes that do not express or establish a desired condition or instream level of protection now or in the future and are therefore not WQS subject to EPA approval or disapproval pursuant to section 303(c) of the CWA. These non-WQS provisions are discussed in the section titled “Provisions that EPA is Not Taking Action On.”

### **III. EPA’s Action on Idaho’s New and Revised WQS**

EPA has completed its review and is acting on Idaho’s submittal, as described below.

This action does not apply to waters within Indian country. Nothing in this letter and Technical Support Document shall constitute an approval or disapproval of a WQS that applies to waters within Indian country.

#### **A. EPA Approval of Non-substantive Clarifications at IDAPA 58.01.02.210.01 and 210.01.b**

##### **EPA Action**

In accordance with its CWA authority, 33 U.S.C. 1313(c)(3) and 40 CFR 131.11, EPA approves the following non-substantive clarifications at IDAPA 58.01.02.210.01 that the numeric toxics criteria for metals for the protection of aquatic life and human health are expressed as a dissolved fraction unless otherwise noted, and changes to headings in Table 2, indicating the numeric criteria are expressed as µg/L unless otherwise specified. All underlined text indicates language that is new and strikeout text indicates language that is removed.

##### **Rule Excerpt:**

#### **210. NUMERIC CRITERIA FOR TOXIC SUBSTANCES FOR WATERS DESIGNATED FOR AQUATIC LIFE, RECREATION, OR DOMESTIC WATER SUPPLY USE.**

**01. Criteria for Toxic Substances.** The criteria of Section 210 apply to surface waters of the state as provided in Tables 1 and 2 Criteria for metals (arsenic through zinc) listed in Tables 1 and 2 are expressed as a dissolved fraction (i.e., passes through a forty-five hundredths (0.45) micron filter) unless otherwise noted.

**a.** Table 1 contains criteria ~~set for to protection of aquatic life. Criteria for metals (arsenic through zinc) are expressed as dissolved fraction unless otherwise noted. For purposes of these criteria, dissolved fraction means that which passes through a forty five hundredths (0.45) micron filter.~~

b. Table 2 contains criteria ~~set for to protection of~~ human health. The Water & Fish criteria apply to waters designated for domestic water supply use. The Fish Only criteria apply to waters designated for primary or secondary contact recreation use.

| Table 2. Criteria for Protection of Human Health (based on consumption of:) |                            |                 |  |   |
|---|----------------------------|-----------------|--|---|
| Compound  | <sup>a</sup><br>CAS Number | Carcinogen<br>? | Water &<br>Fish (µg/L<br><u>unless</u><br><u>otherwise</u><br><u>specified</u> ) | Fish Only<br>(µg/L<br><u>unless</u><br><u>otherwise</u><br><u>specified</u> ) |

## Rationale

EPA approves the above revisions clarifying that metals criteria for toxic substances to protect aquatic life and human health are expressed as the dissolved fraction of the metal, unless otherwise noted. EPA has determined that this is a non-substantive clarification of the application of Idaho's metals criteria. Idaho retained the footnote denoting that the Water & Fish criterion for arsenic is expressed as total recoverable (unfiltered) concentration. Previous versions of Table 2 within IDAPA 58.01.02.210.b included a footnote indicating when human health criteria were expressed as total recoverable (unfiltered) concentration, this indicated that the default was for Idaho's human health criteria for metals to be expressed as a dissolved fraction but it was not explicitly stated for the aquatic life criteria in Table 1.

EPA also approves the revision to the headings in Table 2, clarifying that the numeric human health criteria are expressed as µg/L unless otherwise specified. EPA has determined that this is a non-substantive revision to clarify that certain of Idaho's human health criteria, including the revised arsenic human health criteria that are the subject of this action, are expressed in different units such as concentrations in fish tissue rather than in water.

## B. EPA Approval of Revised Numeric Human Health Criteria for Arsenic at IDAPA 58.01.02.210.01.b

### EPA Action

In accordance with its CWA authority, 33 U.S.C. 1313(c)(3) and 40 CFR 131.11, EPA approves the revised numeric human health criteria for arsenic to protect waters designated for recreation uses and DWS use at IDAPA 58.01.02.210.01.b, including all applicable footnotes. All underlined text indicates language that is new, and strikethrough text indicates language that is removed.

### Rule Excerpt:

| Table 2. Criteria for Protection of Human Health (based on consumption of:) |                            |                 |  |                                     |
|---|----------------------------|-----------------|--|-------------------------------------|
| Compound  | <sup>a</sup><br>CAS Number | Carcinogen<br>? | Water &<br>Fish (µg/L<br><u>unless</u> | Fish Only<br>(µg/L<br><u>unless</u> |

|                      |         |   |                             |     |  |                  |
|----------------------|---------|---|-----------------------------|-----|--|------------------|
|                      |         |   | <u>otherwise specified)</u> |     | <u>otherwise specified)</u>                    |                  |
| Arsenic <sup>2</sup> | 7440382 | Y | 10                          | cdj | <del>10</del> 4.3;<br>8.0 µg/kg<br>fish tissue | <del>cdj</del> k |

|  |
|--|
| c. Inorganic forms only.   |
| d. Criterion expressed as total recoverable (unfiltered) concentrations. |

|   |                            |
|---|----------------------------|
| j. This criterion is based on the drinking water Maximum <del>Containment</del> <u>Contaminant Level (MCL)</u> .  |                            |
| k. <u>For Fish Only exposure to inorganic arsenic, the human health criterion is:</u>   |                            |
| <u>Fish Tissue (µg/kg wet-weight)</u>   | <u>Water Column (µg/L)</u> |
| 8.0 <sup>1</sup>  | 4.3 <sup>2</sup>           |
| <sup>1</sup> <u>Fish tissue element is based on total recoverable inorganic arsenic in muscle or fillet. The fish tissue element super- sedes the water column element provided at least ninety (90) days have passed since any new activity or dis- charge has occurred within the water body. Fish tissue element will be applied in accordance with Subsection 210.03.e.</u> |                            |
| <sup>2</sup> <u>Water column element is based on dissolved inorganic arsenic in water.</u>  |                            |

## Rationale

Idaho applies human health criteria to two separate designated uses. The Water & Fish criteria are applied to waters designated for DWS use, while the Fish Only criteria are applied to waters designated for contact recreation uses.

EPA has determined that the Water & Fish arsenic criterion of 10 µg/L is protective of Idaho's DWS use. Idaho's DWS use requires "water quality appropriate for use as untreated raw water (as defined under IDAPA 58.01.08, "Idaho Rules for Public Drinking Water Systems") for public drinking water."<sup>4</sup> EPA approved Idaho's revised DWS use description on September 16, 2019,<sup>5</sup> noting that it was consistent with Idaho's interpretation that surface waters designated for domestic water supplies are to be protected as source waters that will undergo appropriate treatment by a public drinking water system. States have discretion in how they express drinking water supply uses, and many, like Idaho, choose to express them as water quality sufficient to ensure public water systems that withdraw water from those source waters are not required to provide additional treatment beyond conventional disinfection in order to provide finished water supply at the tap. Protection of the finished water supply provided at the tap is the province of the Safe Drinking Water Act (SDWA). Therefore, the question is whether the Water & Fish criterion adopted by Idaho protects the DWS designated use, i.e., whether it assures a level of ambient water quality that will be suitable for public drinking water, after conventional treatment is completed.

<sup>4</sup> IDAPA 58.01.02.100.03.a.

<sup>5</sup> Letter from Daniel Opalski, Director of US EPA Region 10 Water Division, to Dr. Mary Anne Nelson, Idaho Department of Environmental Quality, re: The EPA Review and Action on Idaho's New and Revised Water Quality Standards, Domestic Water Supply, Idaho Rule Docket 58-0102-1703.

One way to protect the post-treatment drinking water supply use is to set the Water & Fish instream water quality criterion to be as stringent as the maximum contaminant level (MCL) of 10 µg/L required by the SDWA for finished water; Idaho did so here. On this basis, EPA approves Idaho's Water & Fish criterion as protective of the (post-treatment) drinking water use.

In addition, since recreation uses are applied to all Idaho waters designated DWS, the Fish Only criterion will be applied to all waters designated DWS to additionally protect recreational fish consumption in those waters. Where the default water column element of the Fish Only criterion (4.3 µg/L) is applied to a waterbody, EPA notes it will be more stringent than the DWS criterion. EPA's rationale for approving the Fish Only criterion is discussed below.

EPA has determined that the Fish Only criterion composed of a water column element of 4.3 µg/L and a superseding fish tissue element of 8.0 µg/kg (wet weight) is protective of Idaho's recreation uses. Idaho's Fish Only arsenic human health criterion is intended to protect recreational fish consumers from the carcinogenic effects of arsenic. Fish Only human health criteria for carcinogenic effects are calculated using the following input parameters: cancer slope factor (CSF), cancer risk level, body weight, fish consumption rate (FCR), and a bioaccumulation factor(s) (BAFs) – see Figure 1.

Each of these inputs is discussed in EPA's 2000 Human Health Methodology.<sup>6</sup> While the 2000 Human Health Methodology provides national default values, it also recommends that states use the guidance to derive criteria that appropriately reflect local conditions.

|  |  |
|--|--|
| $AWQC = \frac{(\text{Risk Level} \bullet BW)}{[\text{CSF} \bullet (\text{FCR} \bullet \text{BAF})]}$ |  |
| where:   |  |
| AWQC   | = Ambient Water Quality Criterion (milligrams per liter) |
| Risk Level   | = Risk level (unitless)                                  |
| CSF  | = Cancer slope factor (milligrams per kilogram per day)  |
| BW   | = Human body weight (kilograms)                          |
| FCR  | = Fish consumption rate (kilograms per day)              |
| BAF  | = Bioaccumulation factor (liters per kilogram)           |

Figure 1. Simplified version of the equation used to derive human health criteria for carcinogens.

### *Cancer Risk Level*

EPA's CWA section 304(a) national recommended human health criteria for carcinogens are typically based on the assumption that carcinogenicity is a "non-threshold phenomenon," which means that there are no "no-effect" levels, because even extremely small doses are assumed to cause a finite increase in the incidence of cancer. Therefore, EPA calculates 304(a) human health criteria for carcinogenic effects as pollutant concentrations corresponding to lifetime increases in the risk of developing cancer. EPA calculates its 304(a) human health criteria values at a 10<sup>-6</sup> (one in one million) cancer risk level and recommends lifetime excess cancer risk levels of 10<sup>-6</sup> or 10<sup>-5</sup> (one in one hundred thousand) for the general population.

### *Cancer Slope Factor and Reference Dose*

A dose-response assessment is required to understand the quantitative relationships between the exposure to a pollutant and the onset of human health effects. EPA evaluates dose-response relationships derived from

<sup>6</sup> USEPA. 2000. *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health*. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA 822-B-00-004.

animal toxicity and human epidemiological studies to derive dose-response metrics. For carcinogenic toxicological effects, EPA uses an oral CSF to derive human health criteria. The oral CSF is an upper bound, approximating a 95 percent confidence limit, on the increased cancer risk from a lifetime oral exposure to a stressor.

### *Exposure Assumptions*

EPA's latest 304(a) national human health criteria recommendations use a default FCR of 0.022 kg/day for consumption of fish and shellfish from inland and nearshore waters, multiplied by pollutant-specific BAFs to account for the amount of the pollutant in the edible portions of the ingested species. EPA's 2000 Methodology for deriving human health criteria emphasizes using, when possible, measured or estimated BAFs, which account for chemical accumulation in aquatic organisms from all potential exposure routes, rather than other bioaccumulation measures such as bioconcentration factors (BCFs) which only account for the water exposure route.<sup>7</sup>

EPA's national default FCR of 0.022 kg/day represents the 90th percentile consumption rate of fish and shellfish from inland and nearshore waters for the U.S. adult population 21 years of age and older, based on National Health and Nutrition Examination Survey (NHANES) data from 2003 to 2010.<sup>8,9</sup> EPA calculates human health criteria using a default body weight of 80 kilograms (kg), the average weight of a U.S. adult age 21 and older, based on NHANES data from 1999 to 2006.

Although EPA uses these default values to calculate national 304(a) recommended human health criteria, EPA's 2000 Methodology notes a preference for the use of local data to calculate human health criteria (e.g., locally derived FCRs, drinking water intake rates and body weights, and waterbody-specific bioaccumulation rates) over national default values, where data are sufficient to do so, to better represent local conditions.<sup>10</sup>

### *Human Health Criteria Inputs Selected by Idaho*

When developing the Fish Only arsenic criterion using the equation in Figure 1 (above), Idaho used the following inputs:

**Cancer risk level:**  $1 \times 10^{-5}$  (1 in 100,000)

**BW:** 80 kilograms (consistent with EPA's national recommended default)

**FCR:** 0.0665 kilograms per day

**BAF:** 1.87 L/kg, based on trophic level (TL) weighted BAF

**CSF:** 1.5 (mg/kg)/day<sup>11</sup>

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<sup>7</sup> EPA's 2000 Human Health Methodology, section 5.

<sup>8</sup> Estimated Fish Consumption Rates for the U.S. Population and Selected Subpopulations (NHANES 2003-2010), U.S. Environmental Protection Agency, Washington, DC, USA, EPA 820-R-14-002 (Apr. 2014). Available at <https://www.epa.gov/fish-tech/estimated-fish-consumption-rates-reports>

<sup>9</sup> The EPA's national FCR is based on the total rate of consumption of fish and shellfish from inland and nearshore waters (including fish and shellfish from local, commercial, aquaculture, interstate, and international sources). This is consistent with a principle that each state does its share to protect people who consume fish and shellfish that originate from multiple jurisdictions. Human Health Ambient Water Quality Criteria and Fish Consumption Rates: Frequently Asked Questions, U.S. Environmental Protection Agency (Jan. 2013). Available at <https://www.epa.gov/wqc/human-health-ambient-water-quality-criteria-and-fish-consumption-rates-frequently-asked>

<sup>10</sup> EPA's 2000 Human Health Methodology, pp. 2-2, 2-10

<sup>11</sup> This value represents the current oral cancer slope factor contained in EPA's Integrated Risk Information System (IRIS) at the time of this approval. EPA is currently in the process of reassessing the cancer assessment for inorganic arsenic. USEPA. Integrated Risk Information System (IRIS). U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC [www.epa.gov/iris](http://www.epa.gov/iris).

Idaho's use of a cancer risk level of  $1 \times 10^{-5}$ , a body weight of 80 kg, and an FCR of 66.5 g/day are the same inputs Idaho used to update its human health criteria for certain pollutants (not including arsenic) submitted to EPA on December 13, 2016, and approved by EPA on April 4, 2019. At that time, EPA determined that Idaho's human health criteria calculated using these inputs were consistent with the CWA and protective of Idaho's recreation uses.<sup>12</sup> While EPA acknowledges that Idaho tribes hold treaty-reserved rights to fish for their subsistence in Idaho waters, Idaho has not yet adopted a designated use to protect subsistence fishing. Consistent with EPA's regulation at 40 CFR 131.5, EPA's task in reviewing Idaho's revised Fish Only arsenic criteria is to determine whether those criteria protect the relevant use, which is recreation. For the reasons explained herein, EPA has determined that the criteria protect the State's recreation use. Nonetheless, in exercising its CWA section 303(c) authority, EPA has an obligation to ensure that its actions are consistent with treaties reflecting tribal reserved rights. While EPA is choosing not to re-evaluate the cancer risk level and FCR inputs in this action which is specific to arsenic criteria to protect the State's recreation use, EPA is evaluating options to exercise its oversight authority to ensure that Idaho's WQS protect reserved subsistence fishing rights in Idaho. EPA urges Idaho to revise its WQS to protect tribes exercising their treaty-reserved subsistence fishing rights in Idaho, such as by adopting a subsistence fishing designated use and associated human health criteria, where applicable.

Regarding the other inputs that Idaho used to derive its arsenic criteria, Idaho's selected CSF is consistent with EPA's current quantitative estimate of carcinogenic risk from oral exposure to arsenic, as noted above. Therefore, EPA focused the remainder of its analysis on Idaho's selected BAF. A BAF is necessary to calculate a water column concentration that will ensure fish tissue concentrations of arsenic are protective of fish consumers, based on the pollutant toxicity and selected exposure factors and risk level. Idaho calculated a BAF for arsenic of 1.87 L/kg as a trophic-level weighted BAF using extensive paired fish-tissue and water column data from across Idaho<sup>13,14</sup> and trophic level specific consumption ratios from the NHANES 2003-2010.<sup>15</sup> The trophic-level weighted BAF Idaho derived, based on site-specific field data from across Idaho waters, is consistent with EPA recommendations to use available local and regional data when developing criteria.<sup>16</sup> The resulting water column criterion element of 4.3 µg/L is protective of recreational fishers consuming fish from Idaho waters.

Idaho calculated the fish tissue element of 8.0 µg/kg by removing the BAF term from the equation used to calculate the water column element (see Figure 1). EPA finds the fish tissue element to also be protective of Idaho's recreation uses, based on the inputs used.

The fish tissue element is directly related to the route of fish only exposure to arsenic by recreational fishers. Because the fish tissue element is a direct measure of the amount of arsenic that recreational fishers are exposed to and because the BAF used to calculate the water column element adds some uncertainty, EPA agrees with Idaho's determination that the fish tissue element provides a more certain representation of risk. Accordingly, Idaho's revised WQS provide that the fish tissue element supersedes the water column element "... provided at least ninety (90) days have passed since any new activity or discharge has occurred within the water body." EPA has determined that having the fish tissue element supersede the water column

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<sup>12</sup> Technical Support Document: EPA Approval of the State of Idaho's New/Revised Human Health Water Quality Criteria for Toxics and Other Water Quality Standards Provisions Submitted on December 13, 2016. April 4, 2019.

<sup>13</sup> DEQ (Idaho Department of Environmental Quality). 2019. *Arsenic Monitoring to Support Human Health Criteria Adoption (QAPP)*. Boise, ID: Idaho Department of Environmental Quality.

<sup>14</sup> DEQ (Idaho Department of Environmental Quality). 2020. *2019 Arsenic Accumulation in Fish Tissue: Preliminary Monitoring Results*. Boise, ID: Idaho Department of Environmental Quality

<sup>15</sup> See *Idaho Aquatic Human Health Criteria for Arsenic Technical Justification* for a full description of the TL-weighted BAF calculation.

<sup>16</sup> EPA. 2000. Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA-822-B-00-004. page 2-6. Available at: <http://www.epa.gov/waterscience/criteria/humanhealth/method/complete.pdf>



element is protective provided arsenic concentrations are not increasing in a water body, and provided enough time has elapsed to allow for fish tissue concentrations and water column concentrations to equilibrate. The scientific literature suggests that 90 days is sufficient to ensure that fish tissue has reached equilibrium with water column arsenic concentrations.<sup>17</sup>

### **C. EPA Approval of Frequency and Duration of Human Health Toxics Criteria at IDAPA 58.01.02.210.03.d.ii**

#### **EPA Action**

In accordance with its CWA authority, 33 U.S.C. 1313(c)(3) and 40 CFR 131.11, EPA approves the revision to the frequency and duration components for human health toxics criteria at IDAPA 58.01.02.210.03.d.ii. All underlined text indicates language that is new and strikeout text indicates language that is removed.

#### **Rule Excerpt:**

- ii. Frequency and duration for human health toxics criteria. Criteria in Table 2 ~~in~~, Subsection 210.01, are not to be exceeded based on an annual ~~harmonic~~ arithmetic mean concentration.

#### **Rationale**

In statistics, a harmonic mean is used to average rates, whereas water quality data are typically measured as concentrations. The arithmetic mean is more appropriate for measuring the central tendency of concentrations and estimating exposure to toxic pollutants. Furthermore, the harmonic mean of a data set will always be less than the arithmetic mean of the same dataset.<sup>18</sup> Therefore, the use of the arithmetic rather than the harmonic mean in this context is more protective. Idaho's revision to the frequency and duration components for human health toxics criteria is consistent with the CWA and is protective of Idaho's DWS and recreation uses.

### **D. EPA Approval of New Provisions for the Application of the Fish Tissue Element of the Fish Only Arsenic Human Health Criterion at IDAPA 58.01.02.210.03.e, With Exceptions**

#### **EPA Action**

In accordance with its CWA authority, 33 U.S.C. 1313(c)(3) and 40 CFR 131.11, EPA approves Idaho's new provisions for the application of the fish tissue element of the Fish Only arsenic human health criterion at IDAPA 58.01.02.210.03.e, with the following exceptions:

- IDAPA 58.01.02.210.03.e.i and e.ii, and the provision "the Department will evaluate all representative fish tissue data to determine compliance with this criterion element" at IDAPA 58.01.02.210.3.e.iii. EPA is not acting on these new provisions because, as discussed below, EPA has reviewed and concluded that these provisions are not WQS subject to EPA review and action under Section 303(c) of the CWA.
- The provision to calculate bioaccumulation factors using "...other scientifically defensible method for deriving protective BAF" at IDAPA 58.01.02.210.03.e.v(4). EPA disapproves this revision as discussed below.

All underlined text indicates language that is new and strikeout text indicates language that is removed.

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<sup>17</sup> Cui, D., P. Zhang, H. Liu, Z. Zhang, Y. Song, Z. Yang. 2021. The dynamic changes of arsenic biotransformation and bioaccumulation in muscle of freshwater food fish crucian carp during chronic diet-borne exposure. *Journal of Environmental Sciences* 100: 74-81.

<sup>18</sup> Zar, JH. 1984. *Biostatistical Analysis*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

## Rule Excerpt:

e. Application of the fish tissue element of the arsenic criterion for human health.

i. The fish tissue element for total recoverable inorganic arsenic is based on a single measurement using sufficiently sensitive methods.

ii. The single measurement must be made on a sample that is an average or composite of a minimum of five (5) individual fish of the same species collected from the same water body within the same calendar year. When available, game fish species representative of the size and species that may be legally harvested within the waterbody are preferred. Results from multiple sample events may be averaged or composited provided they represent the same species collected from the same water body within the same calendar year.

iii. Not to be exceeded; the Department will evaluate all representative fish tissue data to determine compliance with this criterion element.

iv. For purposes of determining water column targets for the development of effluent limits, TMDL targets, or water column targets for fishless waters, the fish tissue element may be translated to a water column value using a site-specific bioaccumulation factor (BAF) based on the ratio of total recoverable inorganic arsenic in fish muscle or fillet tissue to dissolved inorganic arsenic in the water column using the following equation:

$$WC_T (\mu\text{g/L}) = \frac{8.00 \mu\text{g/kg}}{BAF_{ss} \text{ L/kg}}$$

Where:

$WC_T$  ( $\mu\text{g/L}$ ) is the translated water column value; and

$BAF_{ss}$  L/kg is the site specific BAF calculated consistent with 210.03.e.

In fishless waters, surface water and fish tissue from the immediate downstream waters may be used for bioaccumulation modeling. In the absence of sufficient fish tissue data, the water column element is the applicable criterion element in fishless waters.

v. When translating the fish tissue element to a water column value, the following procedures will be followed.

(1) Data used to translate the fish tissue element must be based on current conditions and consistent with Subsections 210.03.e.i. and ii.

(2) Whenever practical, fish tissue samples must be representative of the game fish species present within the waterbody and include game fish of legally harvestable size. In the absence of suitable game fish species, other resident fish species may be used.

(3) Water column samples must be representative of the annual average concentration of dissolved inorganic arsenic at the site.

(4) BAFs are calculated as a trophic-level weighted BAF or other scientifically defensible method for deriving protective BAF

## Rationale

The above revisions address frequency (Subsection 210.03.e.iii) and provide binding procedures (Subsections 210.03.e.iv and v), to translate the fish tissue element of the Fish Only criterion. These provisions ensure that the fish tissue criterion element and its translations are protective of Idaho's recreation uses.

Subsection 210.03.e.iii identifies the frequency component of the fish tissue criterion element. The frequency component of the fish tissue criterion element differs from the typical water column frequency. Since chemical pollutants are integrated into fish tissue over time, elevated levels in tissue require a relatively longer period to decrease following reduction or removal of an elevated arsenic exposure. Since fish tissue has a longer recovery time than water column concentrations, a frequency of "not to exceed" is appropriate for the tissue criterion element.

Subsections 210.03.e.iv and v provide details on translating the fish tissue criterion element to a water column value using site-specific bioaccumulation data. As discussed above, EPA recommends states use



available local and regional data when developing criteria.<sup>19</sup> The provisions at IDAPA 58.01.02.210.03.e.iv and v provide for developing water column values based on site specific factors (i.e., site specific BAFs) following the same method used to derive the statewide water column criterion element. The provisions at IDAPA 58.01.02.210.03.e.iv and v are legally binding, provide for derivation of individual numeric water column values, and establish the desired condition of the water. These provisions provide a process for deriving a value that is intended to be protective of the use through the translation of the fish tissue criterion, whereas the provisions at IDAPA 58.01.02.210.03.e.i. and ii and the provision “the Department will evaluate all representative fish tissue data to determine compliance with this criterion element” at IDAPA 58.01.02.210.3.e.iii describe how the state evaluates data in order to compare to the criteria.

EPA has determined that the site-specific translation of the fish tissue criterion element is consistent with the CWA and protective of recreation uses when applied consistent with the provisions of IDAPA 58.01.02.210.03.e.

#### **E. EPA Disapproval of the Provision to Calculate Bioaccumulation Factors Using “...Other Scientifically Defensible Method For Deriving Protective BAF”**

##### **EPA Action**

Pursuant to EPA’s authority under CWA section 303(c) and the implementing regulations at 40 CFR 131.11, EPA is disapproving the provision to calculate bioaccumulation factors using “...or other scientifically defensible method for deriving protective BAF” at IDAPA 58.01.02.210.03.e.v(4).

##### **Rationale**

While EPA has concluded that water column values based on site-specific trophic-level weighted BAFs are consistent with the CWA and protective of recreation uses, EPA cannot conclude that any “other scientifically defensible method” will necessarily result in values that will be protective. A different method could produce a result that is either more or less stringent than the trophic-level weighted BAF method or default water column value. Under the CWA and EPA’s implementing regulations at 40 CFR 131.11, EPA has the authority and obligation to determine whether state-submitted criteria are based on a sound scientific rationale and protect applicable designated uses. Idaho’s provision to calculate BAFs using “...other scientifically defensible method for deriving protective BAF” at IDAPA 58.01.02.210.03.e.v(4) leaves the determination of a sound scientific rationale up to the state in the future, with no subsequent EPA review and action under CWA section 303(c). EPA cannot preemptively conclude that all human health criteria resulting from application of a BAF derived from an as-yet unspecified method will be scientifically sound and protective. Therefore, EPA is disapproving the clause “...other scientifically defensible method for deriving protective BAF” at IDAPA 58.01.02.210.03.e.v(4).

##### **i. Remedy to Address the Disapproval**

CWA section 303(c)(3) and the federal WQS regulations at 40 CFR 131.21 state, in part, that if EPA determines that any standard is not consistent with the applicable requirements of the CWA or implementing regulation, the Agency shall notify the state or authorized tribe and specify the changes needed to meet the requirements. The effect of EPA’s disapproval is that the clause “... or other scientifically defensible method for deriving protective BAF” at IDAPA 58.01.02.210.03.e.v(4) is not an applicable WQS for CWA purposes. As a result of the approval action discussed above, Idaho’s WQS will include criteria that EPA has determined to be protective of applicable designated uses, thus, no changes to Idaho’s WQS are necessary to meet the requirements of the CWA. Therefore, EPA is not specifying any changes that Idaho must adopt to

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<sup>19</sup> EPA. 2000. Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA-822-B-00-004. page 2-6. Available at: <http://www.epa.gov/waterscience/criteria/humanhealth/method/complete.pdf>

meet CWA requirements. EPA recommends removing the disapproved clause from Idaho's WQS regulations to avoid confusion and provide greater clarity as to what is in effect for CWA purposes. EPA notes that while this particular flexibility will not be part of the CWA-effective standard, the site-specific translation approach contained in IDAPA 58.01.02.03.e.iv will be CWA-effective and provides an alternative to the default water column value. In the event that Idaho seeks to use an additional method for deriving a BAF to use in the calculation of arsenic human health criteria, Idaho must adopt the resulting criteria and submit those criteria to EPA for review and action under CWA section 303(c).

#### **IV. Provisions Which EPA Has Determined are Not WQS**

As discussed above in Section I.A, EPA considers four questions when evaluating whether a particular provision is a new or revised WQS. If all four questions are answered "yes" then the provision would likely constitute a new or revised WQS that EPA has the authority and duty to approve or disapprove under CWA section 303(c)(3).

EPA is not acting on the following provisions at IDAPA 58.01.02.210.03.e.i. and ii and the provision "the Department will evaluate all representative fish tissue data to determine compliance with this criterion element" at IDAPA 58.01.02.210.3.e.iii because EPA has concluded that these provisions are not WQS subject to EPA review and action under section 303(c) of the CWA:

- i. The fish tissue element for total recoverable inorganic arsenic is based on a single measurement using sufficiently sensitive methods.
- ii. The single measurement must be made on a sample that is an average or composite of a minimum of five (5) individual fish of the same species collected from the same water body within the same calendar year. When available, game fish species representative of the size and species that may be legally harvested within the waterbody are preferred. Results from multiple sample events may be averaged or composited provided they represent the same species collected from the same water body within the same calendar year.
- iii. ...the Department will evaluate all representative fish tissue data to determine compliance with this criterion element

EPA has considered the above language and concluded that these provisions do not express or establish the desired condition or instream level of protection for a waterbody immediately or mandate how it will be expressed or established in the future. Rather, these provisions provide information related to sampling and monitoring for compliance. Therefore, these provisions are not a WQS subject to EPA review and action under section 303(c) of the CWA.

#### **V. Protection of Downstream Waters**

40 CFR 131.10(b) requires that criteria provide for the attainment and maintenance of the WQS of downstream waters. In 2016, Idaho adopted narrative WQS to protect downstream waters, including downstream waters of another state or tribe, at IDAPA 58.01.02.070.08, and submitted the WQS to EPA on December 13, 2016. These revisions were approved by EPA on April 4, 2019.

In Idaho's response to comments (provided with the 2016 submittal), Idaho explained its intention to implement its human health criteria in conjunction with this downstream protection narrative in a manner that will ensure protection of downstream waters. The narrative provision, coupled with the statement in Idaho's response to comment, are consistent with the EPA's regulation requiring state water quality standards ensure the attainment and maintenance of downstream water quality standards (40 CFR 131.10(b)).

EPA expects that Idaho will continue to implement its water quality standards, including the revisions subject to today's action, in concert with the requirements of IDAPA 58.01.02.070.08 to ensure protection of downstream waters within and beyond Idaho's boundaries.