

Arsenic Guidance Document Development April 25, 2023



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

Agenda

- Welcome and Introductions
- Update
- Summary of comments
- Discussion of changes
- Discussion of comments not addressed
- Next Steps



Introductions

Update



- The Idaho Legislature approved the arsenic rule docket.
- The rule docket became final upon adjournment of the legislature, with an effective date of April 6, 2023, and will be included in the Idaho Administrative Code.
- The rule revisions will not go into effect for Clean Water Act purposes until approved by EPA.
- DEQ will submit the rule package to EPA this summer along with the guidance document.

Rule Summary

- Recreation Use Designation:
 - fish tissue criterion of 8.0 $\mu\text{g}/\text{kg}$ or
 - water column criterion of 4.3 $\mu\text{g}/\text{L}$
- The water column criteria of 4.3 $\mu\text{g}/\text{L}$ would apply:
 - If sufficient fish tissue data are not available,
 - The applicant would prefer not to sample for fish,
 - No new activity or discharge that contributes arsenic to the water body within the prior 90 days
- Fish tissue element supersedes water column
- Fish tissue element translates to water column target using site specific bioaccumulation data.



Comments Addressed

First draft

vs.

Second draft

Executive Summary

- ▷ 1 Introduction
- ▷ 2 Background
- ▷ 3 Bioaccumulation Factor
- ▲ 4 Human Health Water Quality Criteria for Arsenic
 - 4.1 Pending Rule
 - ▲ 4.2 Recreational Use Criteria Calculation
 - 4.2.1.1 Fish Tissue Criterion
 - 4.2.1.2 Water Column Criterion
 - 4.2.2 Water Column Translation
 - 4.3 Domestic Water Supply Criterion
- 5 Site Specific Options
- ▲ 6 General Implementation for Human Health Criteria
 - ▲ 6.1 Fish-Tissue Monitoring and Assessment
 - 6.1.1 Recommended Species
 - 6.1.2 Sampling Assessment
 - 6.1.3 Spatial Considerations
 - 6.1.4 Temporal Considerations
- 7 Fishless Waters
- ▷ 8 Antidegradation
- 9 Identifying Impairments for Integrated Report
- ▷ 10 Idaho Pollutant Discharge Elimination System Permits
- ▷ 11 TMDL Program
- References
- Appendix A.

Executive Summary

- ▷ 1 Introduction
- ▷ 2 Background
- ▷ 3 Bioaccumulation Factor
- ◉ 4 Criteria Overview
 - ▲ 4.1 Recreational Use Criteria
 - 4.1.1 Fish Tissue Element
 - 4.1.2 Water Column Element
 - 4.2 Domestic Water Supply Criterion
 - ◉ 4.3 Water Column Translation
 - 4.3.1 Water Column Translation Data Requirements
 - 4.3.2 Calculating a Site-Specific Water Column Translation
 - 4.3.3 Example Water Column Translation Calculation
- ▷ 5 General Implementation Considerations
- 6 Fishless Waters
- 7 Identifying Impairments for Integrated Report
- 8 Antidegradation
- ▷ 9 Clean Water Act Section 401 Water Quality Certifications
- ▷ 10 TMDL Process
- ◉ 11 Idaho Pollutant Discharge Elimination System
- References
- Appendix A. Formulas Utilized for the Development of the Arsenic Rule
- Appendix B. Example Scenarios for the Application of the Human Health Criteria for Arsenic.

High Level Comments/Changes

- Addressed most editorial comments
- Added Human Health Water Quality Criteria example scenarios.
- Expanded the description of waterbody, and fishless waters.
- Better description of fish tissue and water column pairing.
- Expanded the IPDES and TMDL section.

Site-Specific TL-BAF

- Is NOT a site-specific criteria
- Is applied on a permit-by-permit basis
- Incorporates the fish tissue criterion (8 $\mu\text{g/L}$)
- BAFs for TLs 2-4 are needed (default values are available)

Example of a Site Specific TL BAF

Species	Specimen Count	Trophic Level	Fish $\mu\text{g}/\text{kg}$	Water $\mu\text{g}/\text{L}$	Resulting BAF L/kg
Bridgelip Sucker	5	2	2.3	0.608	3.78
Mountain Whitefish	5	3	2.0	0.583	3.43
Pumpkinseed	5	3	9.4	0.583	16.12
Rainbow Trout	5	3	0.2	0.649	0.31
Brown trout	5	4	0.8	0.608	1.32

Trophic Level	Resulting BAF L/kg
2	3.78
3	2.57
4	1.32

To calculate a site-specific trophic level weighted BAF, the above trophic level BAFs are inserted into the appropriate formula as follows (Step (c), section 4.3.2), with a resulting TL-BAF of 2.71 L/kg.

$$TL\ BAF = [(3.78L/kg)(0.36) + (2.57L/kg)(0.40) + (1.32L/kg)(0.24)] = 2.71\ L/kg$$

Using the site-specific TL-BAF, we can then calculate the water column translation as follows, with a resulting translated water column value of 2.95 $\mu\text{g}/\text{L}$.

$$WC_T \left(\frac{\mu\text{g}}{\text{L}} \right) = \frac{8.00\ \mu\text{g}/\text{kg}}{2.71\ \text{L}/\text{kg}} = 2.95\ \mu\text{g}/\text{L}$$





Trophic Level BAF

In the absence of a representative trophic level fish as confirmed by fish biologist consultation or DEQ and Idaho Department of Fish and Game (IDFG) data, default trophic level values from the statewide study may be used

Trophic Level	Species	Rationale	Bioaccumulation Factor (L/kg)
2	Bridgelp Sucker	Herbivorous	2.99
3	Brook Trout, Channel Catfish, Common Carp, Cutthroat Trout, Longnose Dace, Mottled Sculpin, Mountain Whitefish, Rainbow Trout, Redside Shiner	Primarily invertivores, or opportunistic invertivore/piscivore where invertebrates make up a large component of diet	1.82
4	Brown Trout, Largemouth Bass, Northern Pikeminnow, Smallmouth Bass	Primarily piscivores, or diet composed mostly of large invertebrates and fishes	0.27

Waterbody Definition



- Following the definition of **water body unit** from Idaho water quality standards (IDAPA 58.01.02.10.109)
 - ...“all named and unnamed tributaries within a drainage and is considered a single unit unless designated otherwise.”
 - Idaho’s water body units (2,589 total) are subdivisions of the state’s 84 USGS hydrologic cataloguing units (also referred to as sub-basins) spread across six basins statewide. A list of all the water body units and the locations in Idaho are provided at IDAPA 58.01.02.110-160.
 - A water body unit may be divided or split based on information that shows distinct differences within a water body unit, such as changes in land use, local geography or ecosystem.

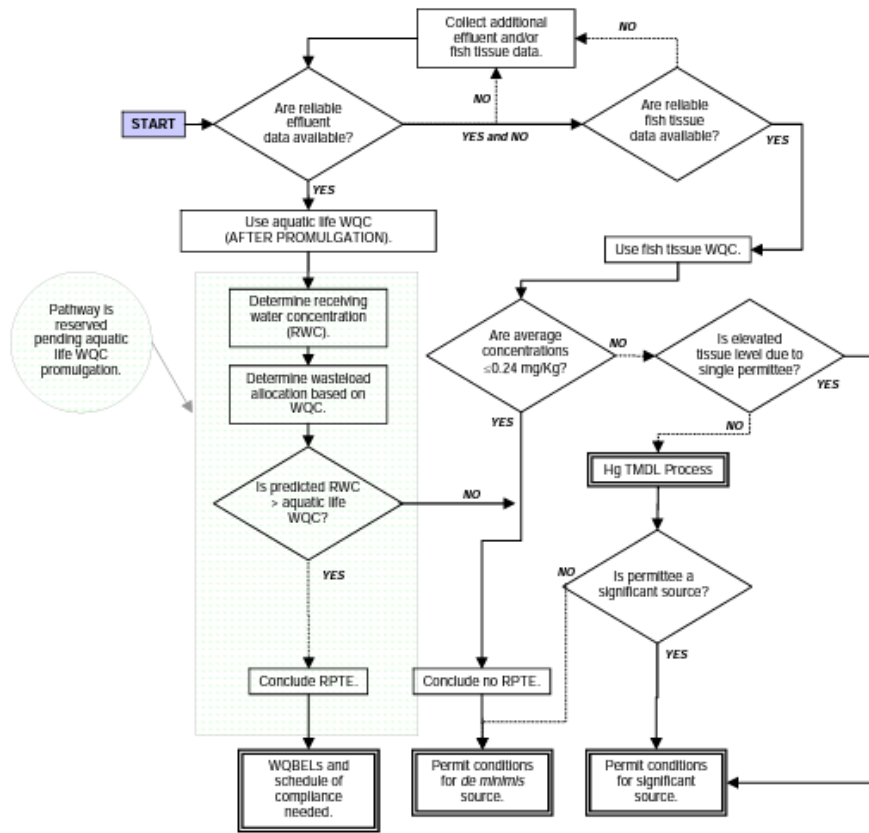


Comments Not Addressed

Trophic Level Proportions

Trophic Level	National Consumption rate, g/d	Proportion
2	7.6	0.36
3	8.6	0.40
4	5.1	0.24
Total	21.3	1.0
<p>Source: EPA 2014. <i>Estimated Fish Consumption Rates for the U.S. Population and Selected Subpopulations.</i></p>		

Species Group	Description	Species and Groups Included
Group 1	All finfish and shellfish	All group 2 species, marine finfish (cod, halibut, pollock, tuna, herring, sardines, mackerel, mahi mahi, orange roughy, red snapper, seabass, hamachi, kipper and shark) and other marine shellfish (lobster, crab and shrimp)
Group 2	Near coastal, estuarine, freshwater and anadromous	All species in groups 3, 4 and 5; lobster, crab, shrimp, octopus, oysters, geoduck, razor clam, bay mussel, scallops, and other marine clams or mussels
Group 3	Salmon or steelhead	Chinook, coho, sockeye, kokanee, steelhead, chum, pink, Atlantic and any unspecified salmon species
Group 4	Resident trout	Rainbow, cutthroat, cutbow, bull, brook, lake, brown, bottoms, golden and any unspecified trout species.
Group 5	Other freshwater finfish or shellfish	Lamprey, sturgeon, whitefish, sucker, bass, bluegill, carp, catfish, crappie, sunfish, tilapia, walleye, yellow perch, crayfish, freshwater clams or mussels and any unspecified freshwater species
Group 6	Marine finfish or shellfish	Marine finfish (cod, halibut, pollock, tuna, herring, sardines, mackerel, mahi mahi, orange roughy, red snapper, seabass, kipper, wahoo, yellowtail and shark), marine shellfish (lobster, crab, shrimp, octopus, squid, oysters, geoduck, razor clam, bay mussel, scallops, and other marine clams or mussels) and any unspecified marine finfish or shellfish
Group 7	Unspecified finfish or shellfish	Any response where the species was specified sufficiently to be placed into groups 3, 4, 5 or 6



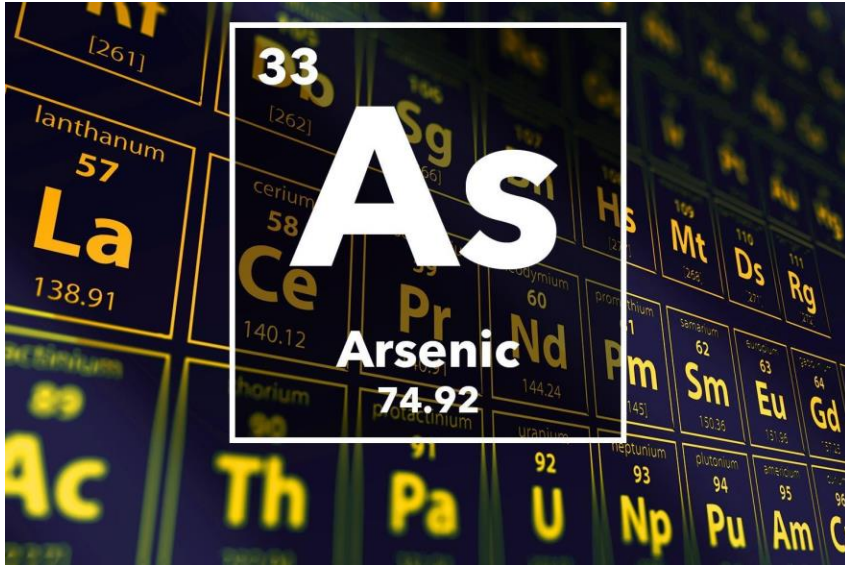
NOTE: As detailed in Chapter 5, if a TMDL is not yet in place for an impaired water, permit conditions would be required until a TMDL can be completed. These conditions may be revised, if needed, following the TMDL process.

Figure 6-1. Recommended Mercury RPTe Process.

Request to include a decision tree for TMDL similar to Mercury.

A winter landscape featuring a dense forest of snow-laden evergreen trees under a clear blue sky. In the foreground, a river flows through a snowy field, with several large ice floes floating in the water. The scene is bright and clear, suggesting a sunny day.

Comments to be addressed



- Additional text regarding naturally occurring arsenic in Idaho in the background section.
- Add additional examples or details to the water column value section.

Next Steps

- Second Draft out for review
 - April 10, 2023
- Third working group meeting
 - April 25, 2023
- Comment Deadline
 - May 8, 2023
- Address Comments
 - June 2023
- *(Hopefully)* Final draft out for 30-day public review early July.





Discussion

Thank you.

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