

# Revision of Idaho's Human Health Criteria for Arsenic

Docket No. 58-0102-1801  
June 23, 2021



STATE OF IDAHO  
DEPARTMENT OF  
ENVIRONMENTAL QUALITY

Jason Pappani  
Surface Water Bureau Chief

# Outline

- Review
- Comments
- Review Draft Rule
- Discuss Alternatives
- Next Steps



# Rulemaking Review

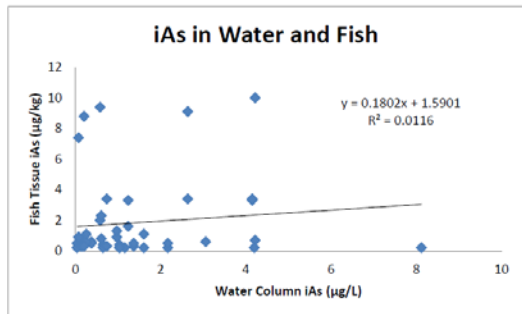
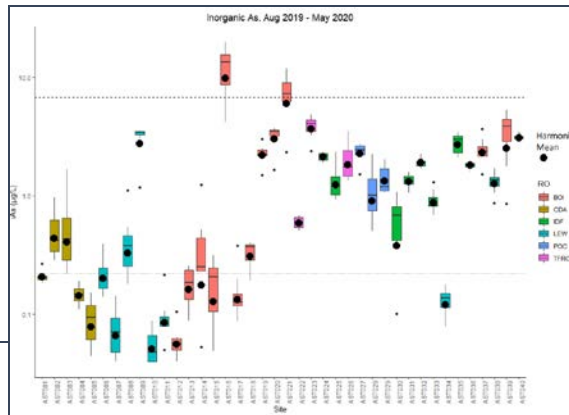


Figure 1. Inorganic arsenic (iAs) in water versus fish tissue.



Idaho Department of  
Environmental Quality

## 2019 Arsenic Accumulation in Fish Tissue

Preliminary Monitoring Results



Negotiated Rulemaking  
Docket No. 58-0102-1801

## Update to Human Health Criteria for Arsenic

April 19, 2018



Negotiated Rulemaking  
Docket No. 58-0102-1801

## Update to Human Health Criteria for Arsenic

June 27, 2018



1992	1995	1999	2010	2016	2018	2023
National Toxics Rule	Idaho Revises	Idaho Adopts MCL	Idaho Revises to new MCL	EPA reconsiders, disapproves	Idaho initiates rulemaking, EPA and NWEA modify consent decree	New state or Federal Criteria



# Comments Received



# ICL

- Does not support tissue only criterion for Fish Only
  - Suggest criterion is arbitrary
- Does not support the proposed approach to Fish+Water



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# Recreation/Fish Only

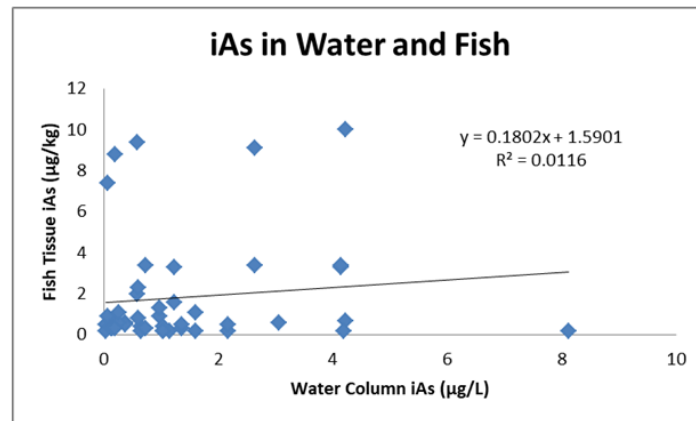
$$AWQC = RSD \times \left( \frac{BW}{(FI \times BAF)} \right)$$

$$RSD = \frac{\text{Cancer Risk Factor } (1 \times 10^{-5})}{\text{Cancer Potency Factor } (1.5 \text{ (mg/kg day)}^{-1})}$$

**BW** = Body Weight; 80 kg

**FI** = Fish Intake; 0.0665 kg/day

**BAF** = Geomean of all; 1.12 L/kg



# Domestic Water Supply/Fish + Water

- Subsection 100.03.a
  - *Domestic (DWS): 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.*
- Subsection 070.01
  - *Multiple Criteria. In the application of the use designation, the most stringent criterion of a multiple criteria applies.*

# IACI

- Suggest using arithmetic mean of concentrations, rather than harmonic mean



# Clearwater Paper and AIC

- Support rule as written, suggest developing guidance in conjunction with rulemaking



# NCASI

- Idaho's 2019 data results are consistent with what other studies have found
- Request DEQ develop and maintain a single public database with DEQ and outside fish tissue data
- Suggest analyses of Idaho data include data from other studies



# EPA R10

- *"EPA has concluded that a fish tissue value alone will not ensure that the designated use is protected and that a water column arsenic human health criterion is needed to protect Idaho's recreational uses."*
- Suggest including MCL value or incorporation by reference.
- Suggest adopting MCL frequency and duration for As.
- Provide details on implementation of As criteria to ensure downstream waters protection.

# Review Draft Rule

Exposure	Criterion
<b>Fish Only (Recreation)</b>	<b>8 µg/kg</b>
Fish muscle (fillet) tissue: 8 µg/kg on a wet-weight basis, based on an average or composite of a minimum of five (5) individual fish of the same species, where the smallest individual is no less than seventy-five percent (75%) of the total length (size) of the largest individual.	

# Review Draft Rule

Exposure	Criterion
<b>Fish + Water (Domestic Water Supply)</b>	*
<p>Human health criteria for Water &amp; Fish exposure to inorganic arsenic are attained if fish tissue concentrations comply with the Fish Only criterion and water column concentrations meet the maximum contaminant level for inorganic arsenic provided in IDAPA 58.01.08, “Idaho Rules for Public Drinking Water Systems.”</p>	

# Idaho HHC Exposure Factors

$$AWQC = RSD \times \left( \frac{BW}{(FI \times BAF)} \right)$$

$$RSD = \frac{\text{Cancer Risk Factor } (1 \times 10^{-5})}{\text{Cancer Potency Factor } (1.5 \text{ (mg/kg day)}^{-1})}$$

**BW** = Mean Body Weight; kg

**FI** = Representative Fish Intake; kg/day

**BAF** = L/kg

# Idaho HHC Exposure Factors

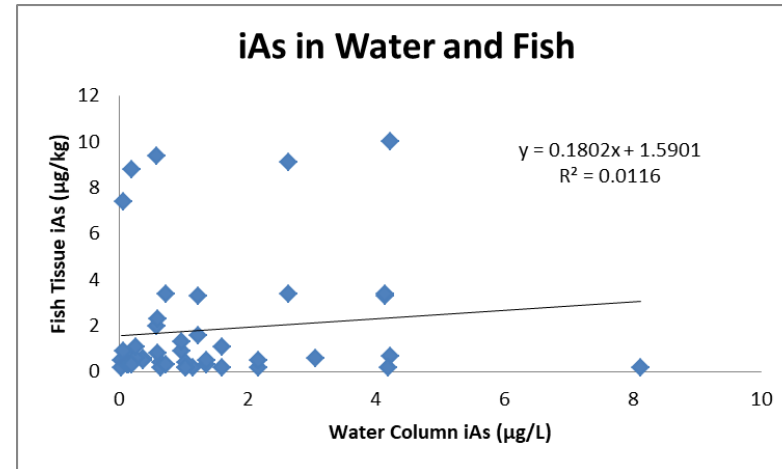
$$AWQC = RSD \times \left( \frac{BW}{(FI \times BAF)} \right)$$

$$RSD = \frac{\text{Cancer Risk Factor } (1 \times 10^{-5})}{\text{Cancer Potency Factor } (1.5 \text{ (mg/kg day)}^{-1})}$$

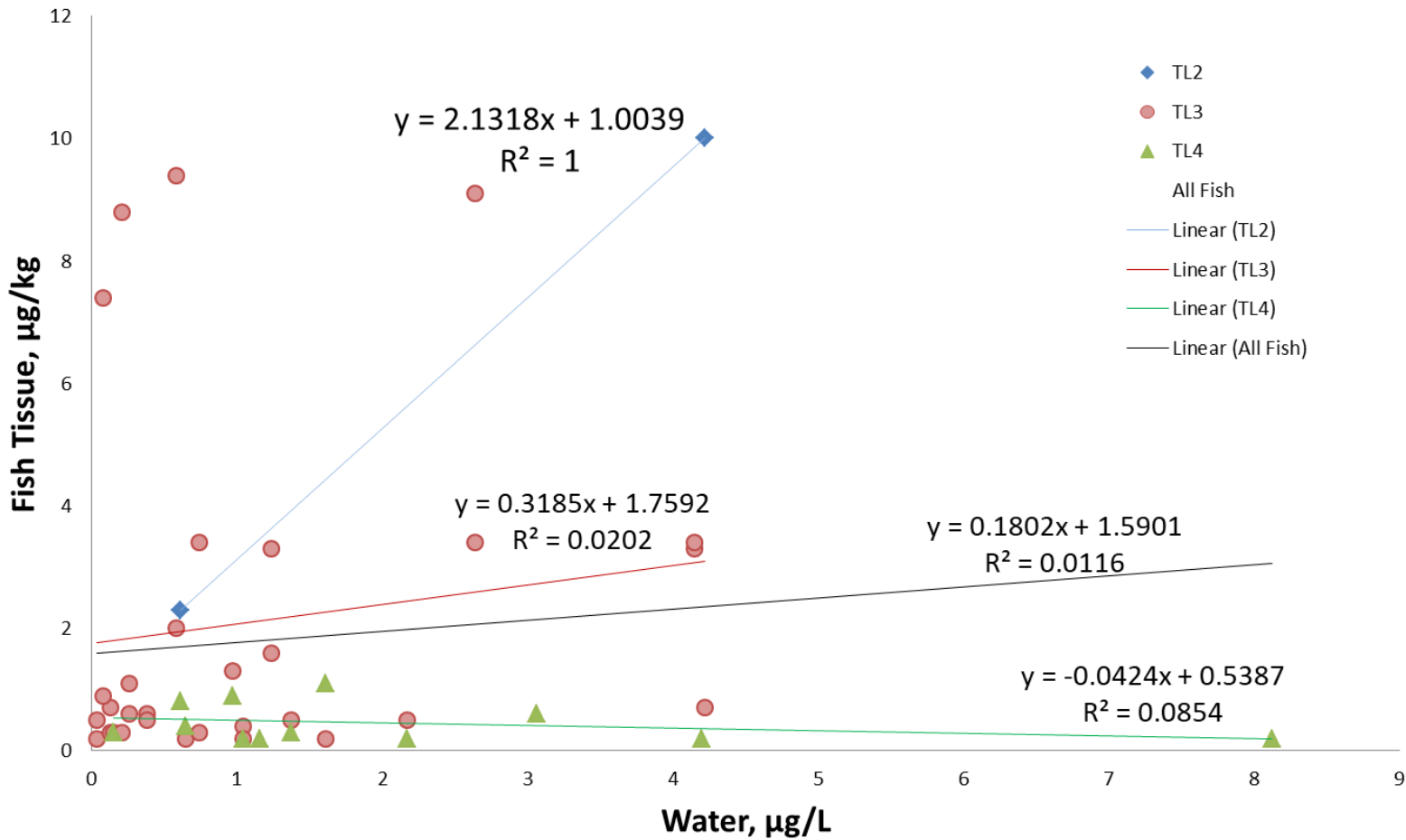
**BW** = Body Weight; 80 kg

**FI** = Fish Intake; 0.0665 kg/day

**BAF** = Geomean of all; 1.12 L/kg



# Inorganic As, Water vs. Fish



# Fish Only/Recreation Options

1. Fish Tissue Only Criterion
2. Water Column Only Criterion
3. Tissue and Water Column Elements; Tissue Supersedes
4. Tissue Criterion; Water Column Screening

# Tissue Only

- Based on modified HHC equation

$$\text{Fish tissue criteria} = \left( \frac{(1 \times 10^{-5})}{1.5 \text{ (mg/kg day)}^{-1}} \right) \times \left( \frac{80 \text{ kg}}{\left(0.0665 \frac{\text{kg}}{\text{day}}\right) \times \text{BAF}} \right)$$

$$\text{Fish tissue criteria} = 8 \mu\text{g/kg}$$

# Water Column Only

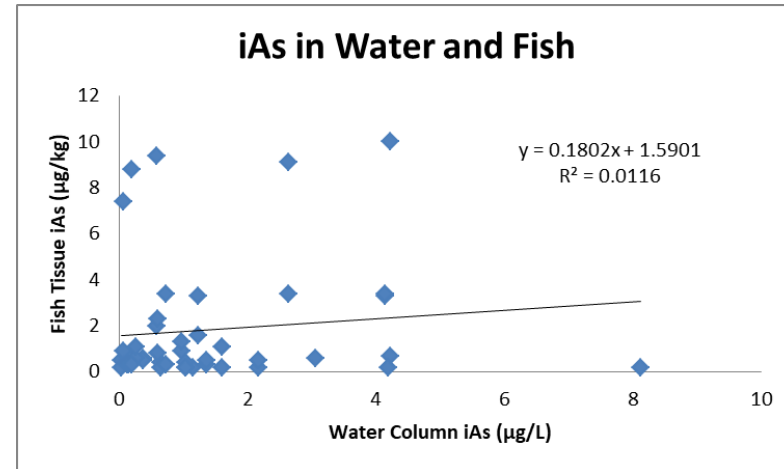
$$AWQC = RSD \times \left( \frac{BW}{(FI \times BAF)} \right) = 7.16 \mu\text{g/L}$$

$$RSD = \frac{\text{Cancer Risk Factor } (1 \times 10^{-5})}{\text{Cancer Potency Factor } (1.5 \text{ (mg/kg day)}^{-1})}$$

**BW** = Body Weight; 80 kg

**FI** = Fish Intake; 0.0665 kg/day

**BAF** = Geomean of all; 1.12 L/kg



# Tissue + water column, tissue supersedes

Fish Tissue*	Water Column
8 $\mu\text{g}/\text{kg}$	7.16 $\mu\text{g}/\text{L}$

\*Fish Tissue element supersedes water column element

# Tissue + water column screening

Fish Tissue	Water Column Screen
8 $\mu\text{g}/\text{kg}$	7.16 $\mu\text{g}/\text{L}$

\*Water Column element is not a criterion

# Fish + Water/Domestic Water Supply

- Harmonize with MCL frequency/duration
- How to adopt (by reference, number, etc.)



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# Current Status of As in Idaho

## Fish Tissue

- 41 of 45 samples  $<8.0 \mu\text{g}/\text{kg}$
- In general, Idahoans are not at risk of As from consuming fish from Idaho waters

## Water Column

- 460 of 475 targeted samples  $<7.16 \mu\text{g}/\text{L}$
- 465 of 475 targeted samples  $<10 \mu\text{g}/\text{L}$
- In general, Idaho waters would meet updated As criteria

# Next Steps

- Comment Deadline: July 14, 2021
- Next Meeting: August 18, 2021



# Discussion



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