WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Wyoming Surface Water Quality Standards

Drinking Water and Fish Consumption Criteria

Triennial Review Stakeholder Group
April 23, 2021

Outline

- Review of Water Quality Criteria Requirements
- Nationally Recommended Drinking Water and Fish Consumption Criteria
- Wyoming's Drinking Water and Fish Consumption Criteria
- Examples of Drinking Water and Fish Consumption Criteria From Other States
- Ideas for Potential Changes to Wyoming's Standards
  - Names of uses and criteria
  - Duration and frequency of criteria
  - Whether to adopt updated nationally recommended criteria
  - Organoleptic criteria, cancer risk factors, criteria assumptions

Surface Water Quality Standards

Designated Uses

Implementation

Water Quality Criteria

Antidegradation

Water Quality Criteria

- Concentrations of pollutants or narrative statements to protect designated uses

Water Quality Criteria: Clean Water Act

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

40 CFR 131.11

- Water quality criteria must protect the designated use

Water Quality Criteria: Clean Water Act

40 CFR 131.11

- Water quality criteria can be based on
  - Clean Water Act Section 304(a) guidance*

*criteria for water quality that reflect the latest scientific knowledge

Water Quality Criteria: Clean Water Act

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

40 CFR 131.11

- Water quality criteria can be based on
  - 304(a) guidance modified to reflect site-specific conditions

Water Quality Criteria: Clean Water Act

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

40 CFR 131.11

- Water quality criteria can be based on
  - Other scientifically defensible methods

Water Quality Criteria: Clean Water Act

40 CFR 131.11

- Water quality criteria can be
  - narrative criteria or criteria based on biomonitoring methods where numerical criteria cannot be established or to supplement numeric criteria

Nationally Recommended Water Quality Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Summary of the Clean Water Act

33 U.S.C. §1251 et seq. (1972)

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972. "Clean Water Act" became the Act's common name with amendments in 1972.

Under the CWA, EPA has implemented pollution control programs such as setting wastewater standards for industry. EPA has also developed national water quality criteria recommendations for pollutants in surface waters.

The CWA made it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained:

- EPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges.
- Point sources are discrete conveyances such as pipes or man-made ditches.
  - Individual homes that are connected to a municipal system, use a septic system, or do not

Quick Links

- 2018 version of CWA from the U.S. Code (233 pp, 1.23 MB)

You may need a PDF reader to view some of the files on this page. See EPA's About PDF page to learn more

- The official text of the CWA continues to be available in the *United States Code* from the US Government Printing Office

§ 1314. Information and guidelines

(a) Criteria development and publication

(1) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall develop and publish, within one year after October 18, 1972 (and from time to time thereafter revise) criteria for water quality accurately reflecting the latest scientific knowledge (A) on the kind and extent of all identifiable effects on health and welfare including, but not limited to, plankton, fish, shellfish, wildlife, plant life, shorelines, beaches, esthetics, and recreation which may be expected from the presence of pollutants in any body of water, including ground water; (B) on the concentration and dispersal of pollutants, or their byproducts, through biological, physical, and chemical processes; and (C) on the effects of pollutants on biological community diversity, productivity, and stability, including information on the factors affecting rates of eutrophication and rates of organic and inorganic sedimentation for varying types of receiving waters.

(2) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall develop and publish, within one year after October 18, 1972 (and from time to time thereafter revise) information (A) on the factors necessary to restore and maintain the chemical, physical, and biological integrity of all navigable waters, ground waters, waters of the contiguous zone, and the oceans; (B) on the factors necessary for the protection and propagation of shellfish, fish, and wildlife for classes and categories of receiving waters

Nationally Recommended Water Quality Criteria

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Related Topics: Water Quality Criteria | CONTACT US | SHARE

National Recommended Water Quality Criteria – Human Health Criteria Table

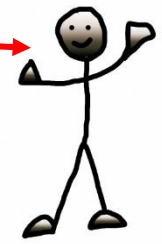
Human health ambient water quality criteria represent specific levels of chemicals or conditions in a water body that are not expected to cause adverse effects to human health. EPA provides recommendations for "water + organism" and "organism only" human health criteria for states and authorized tribes to consider when adopting criteria into their water quality standards. These human health criteria are developed by EPA under Section 304(a) of the Clean Water Act.

Select pollutant name for current criteria document.

Related Information

- Human Health Criteria Calculation Matrix
- Human Health Criteria and Methods for Toxics
- Organoleptic Effects Criteria Table
- Aquatic Life Criteria Table

Pollutant	CAS Number	Human Health for the consumption of Water + Organism (µg/L)	Human Health for the consumption of Organism Only (µg/L)	Publication Year	Notes
					The criterion for organoleptic (taste and



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Related Information

- Human Health Criteria Calculation

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Related Information

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Select pollutant name for

~ 122 Pollutants

Pollutant

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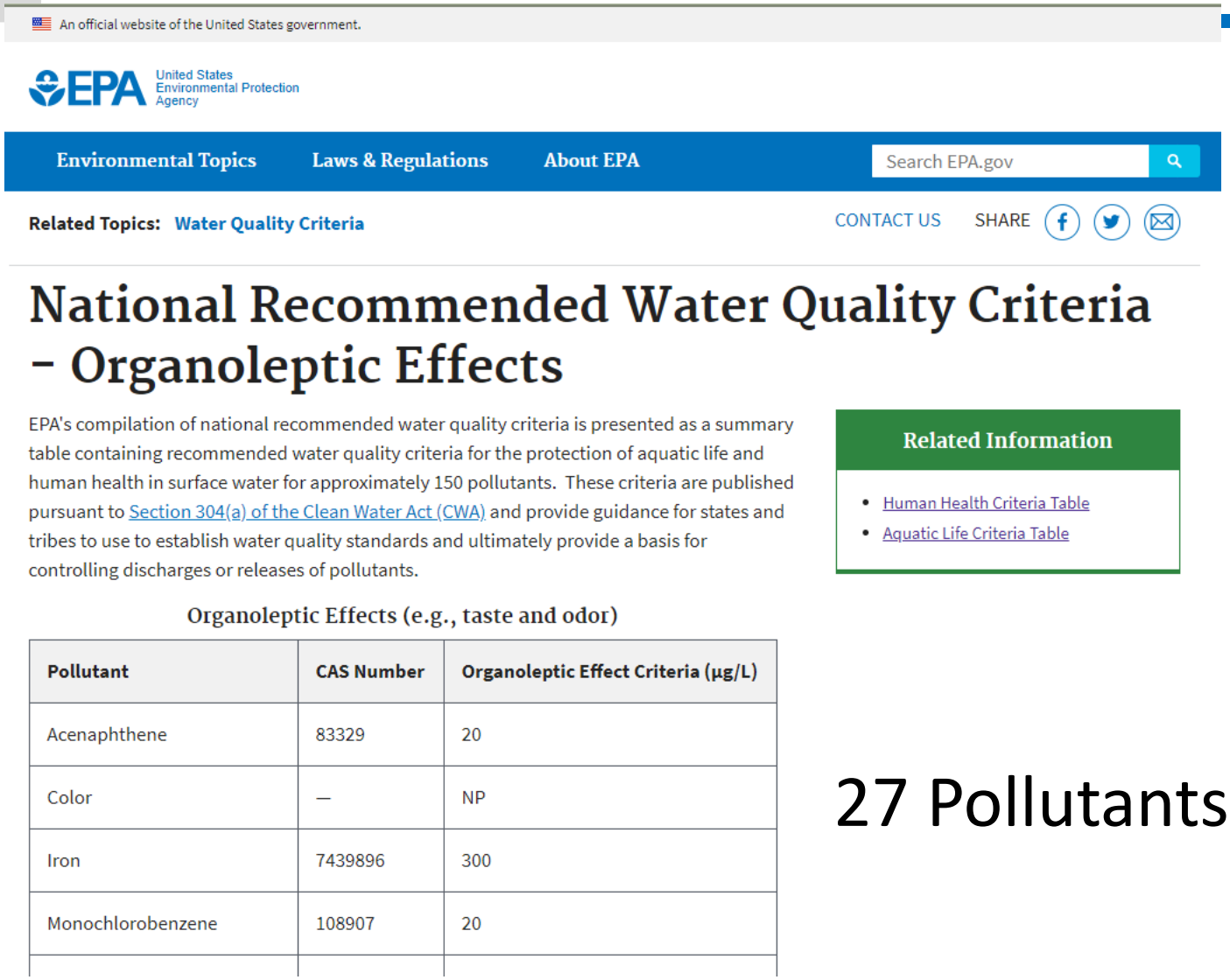

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National Recommended Water Quality Criteria – Organoleptic Effects

EPA's compilation of national recommended water quality criteria is presented as a summary table containing recommended water quality criteria for the protection of aquatic life and human health in surface water for approximately 150 pollutants. These criteria are published pursuant to Section 304(a) of the Clean Water Act (CWA) and provide guidance for states and tribes to use to establish water quality standards and ultimately provide a basis for controlling discharges or releases of pollutants.

Related Information

- Human Health Criteria Table
- Aquatic Life Criteria Table

Organoleptic Effects (e.g., taste and odor)

Pollutant	CAS Number	Organoleptic Effect Criteria (µg/L)
Acenaphthene	83329	20
Color	—	NP
Iron	7439896	300
Monochlorobenzene	108907	20

27 Pollutants

- Developed to protect against taste and odor

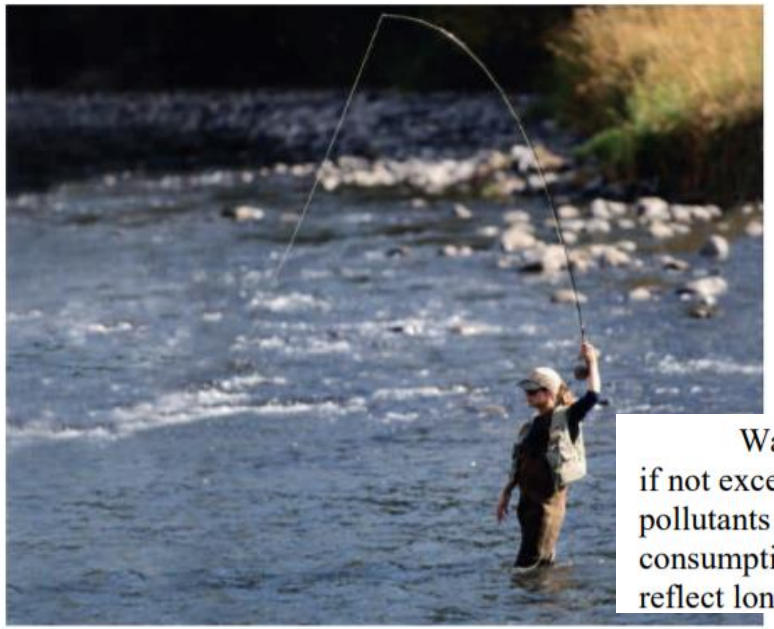
Criteria for Protection of Consumption of Drinking Water and Aquatic Organisms

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

United States Environmental Protection Agency | Office of Water, Office of Science and Technology, 4304 | EPA-822-B-00-004, October 2000

EPA

Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000)



Water quality criteria are derived to establish ambient concentrations of pollutants which, if not exceeded, will protect the general population from adverse health impacts from those pollutants due to consumption of aquatic organisms and water, including incidental water consumption related to recreational activities. For each pollutant, chronic criteria are derived to reflect long-term consumption of food and water. An important decision to make when setting

- Represent levels of pollutants in surface waters that will minimize the risk of adverse effects to humans from chronic (lifetime) exposure to substances through the ingestion of drinking water and aquatic organisms from surface waters

Criteria for Protection of Consumption of Drinking Water and Aquatic Organisms

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- Also intended to be protective against adverse effects that may be expected to occur as a result of acute or short-term exposures

Although the AWQC are based on chronic health effects data (both cancer and noncancer effects), the criteria are intended to also be protective against adverse effects that may reasonably be expected to occur as a result of elevated acute or short-term exposures. That is, through the use of conservative assumptions with respect to both toxicity and exposure parameters, the resulting AWQC should provide adequate protection not only for the general population over a lifetime of exposure, but also for special subpopulations who, because of high water- or fish-intake rates, or because of biological sensitivities, have an increased risk of receiving a dose that would elicit adverse effects. The Agency recognizes that there may be some cases where the AWQC based on chronic toxicity may not provide adequate protection for a subpopulation at special risk from shorter-term exposures. The Agency encourages States, Tribes, and others employing the 2000 Human Health Methodology to give consideration to such circumstances in deriving criteria to ensure that adequate protection is afforded to all identifiable subpopulations. (See Section 4.3, Factors Used in the AWQC Computation, for additional discussion of these subpopulations.)

Criteria for Protection of Consumption of Drinking Water and Aquatic Organisms

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Develop drinking water criteria because:

- Drinking water is a designated use and criteria are needed
- Although rare, some public water supplies are not treated
- Existing treatments may not be effective for some pollutants
- Ambient waters should not be polluted such that the burden is shifted from dischargers to public water supplies

4.1.1.1 Appropriateness of Including the Drinking Water Pathway in AWQC

EPA intends to continue including the drinking water exposure pathway in the derivation of its national default human health criteria (AWQC), as has been done since the 1980 AWQC National Guidelines were first published.

EPA recommends inclusion of the drinking water exposure pathway where drinking water is a designated use for the following reasons: (1) Drinking water is a designated use for surface waters under the CWA and, therefore, criteria are needed to assure that this designated use can be protected and maintained. (2) Although rare, there are some public water supplies that provide drinking water from surface water sources without treatment. (3) Even among the majority of water supplies that do treat surface waters, existing treatments may not necessarily be effective for reducing levels of particular contaminants. (4) In consideration of the Agency's goals of pollution prevention, ambient waters should not be contaminated to a level where the burden of achieving health objectives is shifted away from those responsible for pollutant discharges and placed on downstream users to bear the costs of upgraded or supplemental water treatment.

Criteria for Protection of Consumption of Drinking Water and Aquatic Organisms

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EPA

Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000)

No separate drinking water criteria because:

- Clean Water Act requirements for fishable and swimmable uses
- Waters have multiple designated uses
- If a waterbody is used for drinking water, it likely supports consumable aquatic life

4.1.1.2 Setting Separate AWQC for Drinking Water and Fish Consumption

In conjunction with the issue of the appropriateness of including the drinking water pathway explicitly in the derivation of AWQC for the protection of human health, EPA intends to continue its practice of setting a single AWQC for both drinking water and fish/shellfish consumption, and a separate AWQC based on ingestion of fish/shellfish alone. This latter criterion applies in those cases where the designated uses of a waterbody include supporting fishable uses under Section 101(a) of the CWA and, thus, fish or shellfish for human consumption, but not as a drinking water supply source (e.g., non-potable estuarine waters).

EPA does not believe that national water quality criteria for protection of drinking water uses only are particularly useful for two reasons. First, State and Tribal standards for human health are set to protect Section 101(a) uses (e.g., "fishable, swimmable uses") under the CWA. Second, most waters have multiple designated uses. Additionally, the water quality standards program protects aquatic life. The 2000 Human Health Methodology revisions do not change EPA's policy to apply aquatic life criteria to protect aquatic species where they are more sensitive (i.e., when human health criteria would not be protective enough) or where human health via fish or water ingestion is not an issue.

Criteria for Protection of Consumption of Drinking Water and Aquatic Organisms

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Inputs

- Body Weight
- Water Consumption Rate
- Fish Consumption Rate
- Health Toxicity Values
  - Duration of Exposure (70 years)
- Relative Source Contribution
- Bioaccumulation Factor

$$AWQC = RfD \bullet \boldsymbol{RSC} \bullet \frac{(\boldsymbol{BW})}{[\boldsymbol{DI} + (\boldsymbol{FI} \bullet BAF)]}$$ (Equation 4-1)

where:

AWQC	=	Ambient Water Quality Criterion (mg/L)
RfD	=	Reference dose for noncancer effects (mg/kg-day)
RSC	=	Relative source contribution factor to account for non-water sources of exposure
BW	=	Human body weight (kg)
DI	=	Drinking water intake (L/day)
FI	=	Fish intake (kg/day)
BAF	=	Bioaccumulation factor (L/kg)

Criteria for Protection of Consumption of Drinking Water and Aquatic Organisms

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Inputs

- Health Toxicity Values
  - Carcinogens
  - Noncarcinogens
- Relative Source Contribution
  - Accounts for more potential exposure pathways (ocean fish, other meats, grains, vegetables, fruits, dermal exposure, respiratory exposure) to ensure individual's total exposure does not exceed the criteria
- Bioaccumulation Factor
  - Accounts for accumulation within fish/aquatic organisms and assumes three trophic levels

Criteria for Protection of Consumption of Aquatic Organisms

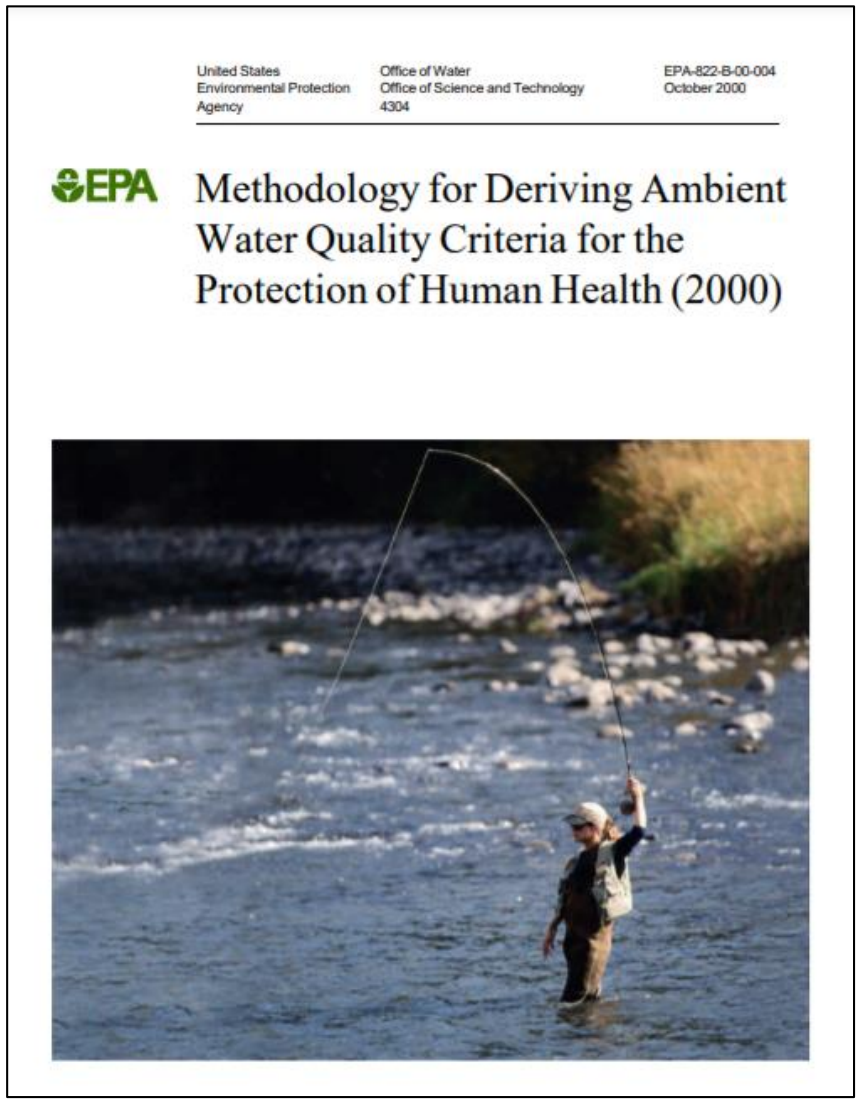
WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Inputs

- Body Weight
- Fish Consumption Rate
- Health Toxicity Values
  - Duration of exposure
- Relative Source Contribution
- Bioaccumulation Factor

Criteria for Protection of Consumption of Drinking Water and Aquatic Organisms

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY



- Body Weight: Arithmetic mean
- Relative Source Contribution: Arithmetic mean of other exposures (e.g., non-fish dietary)
- Bioaccumulation Factor: Median (50th percentile)
- Drinking Water Intake: 90th percentile estimate
- Fish Intake: 90th percentile estimates

Although it is not possible to subject the estimates to such a rigorous analysis (say, for example, to determine what criterion value provides protection of exactly the 90th percentile of the population), EPA believes that the combination of parameter value assumptions achieves its target goal, without being inordinately conservative. The standard assumptions made for the national 304(a) criteria are as follows. The assumed body weight value used is an arithmetic mean, as are the RSC intake estimates of other exposures (e.g., non-fish dietary), when data are available. The BAF component data (e.g., for lipid values, for particulate and dissolved organic carbon) are based on median (i.e., 50th percentile) values. The drinking water intake values are approximately 90th percentile estimates and fish intake values are 90th percentile estimates. EPA believes the use of these values will result in 304(a) criteria that are protective of a majority of the population; this is EPA's goal.

Criteria for Protection of Consumption of Drinking Water and Aquatic Organisms

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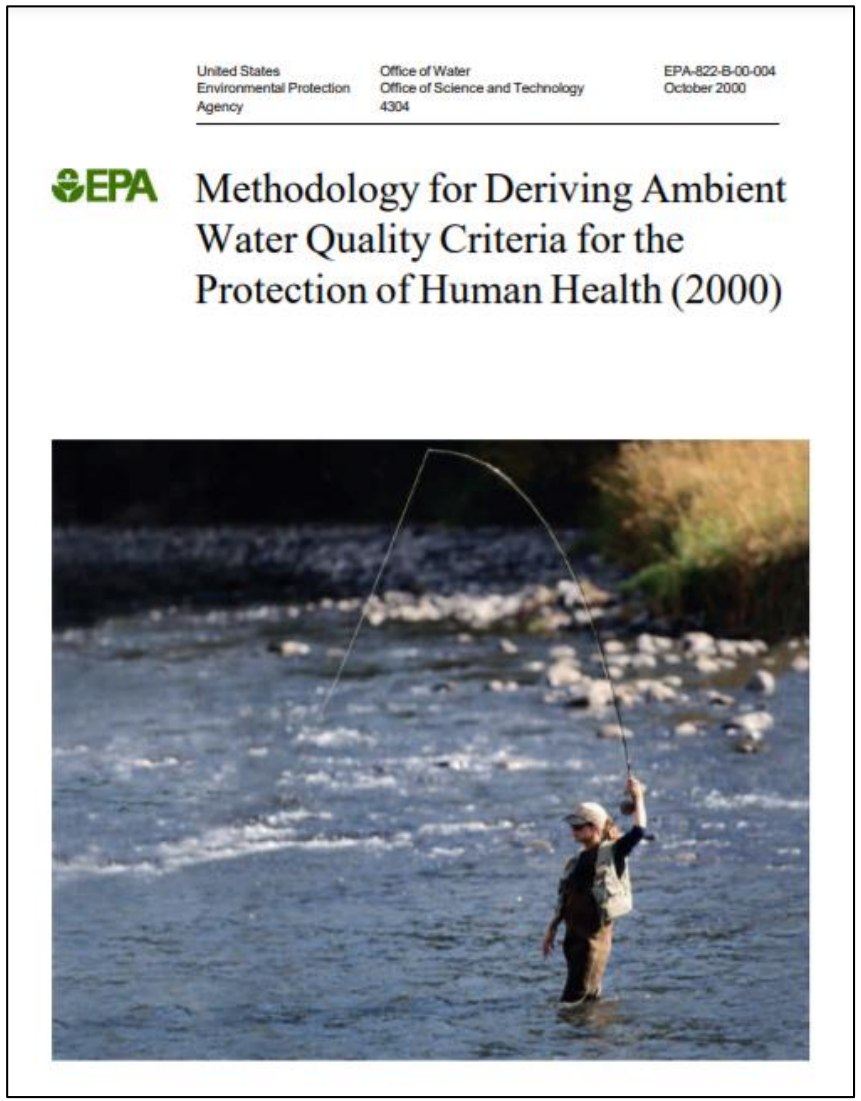

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EPA

Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000)

Flexibilities

- Criteria require several risk management decisions best made at the local level
- Encourage states to develop or revise water quality criteria to reflect local conditions

EPA will use this Methodology to develop new ambient water quality criteria and to revise existing recommended water quality criteria. It also provides States and authorized Tribes the necessary guidance to adjust water quality criteria developed under Section 304 to reflect local conditions or to develop their own water quality criteria using scientifically defensible methods consistent with this Methodology. EPA encourages States and authorized Tribes to use this Methodology to develop or revise water quality criteria to appropriately reflect local conditions. EPA believes that ambient water quality criteria inherently require several risk management decisions that are, in many cases, better made at the State, Tribal, or regional level. Additional guidance to assist States and authorized Tribes in the modification of criteria based on the Methodology will accompany this document in the form of three companion Technical Support Documents on Risk Assessment, Exposure Assessment, and Bioaccumulation Assessment.

Criteria for Protection of Consumption of Drinking Water and Aquatic Organisms

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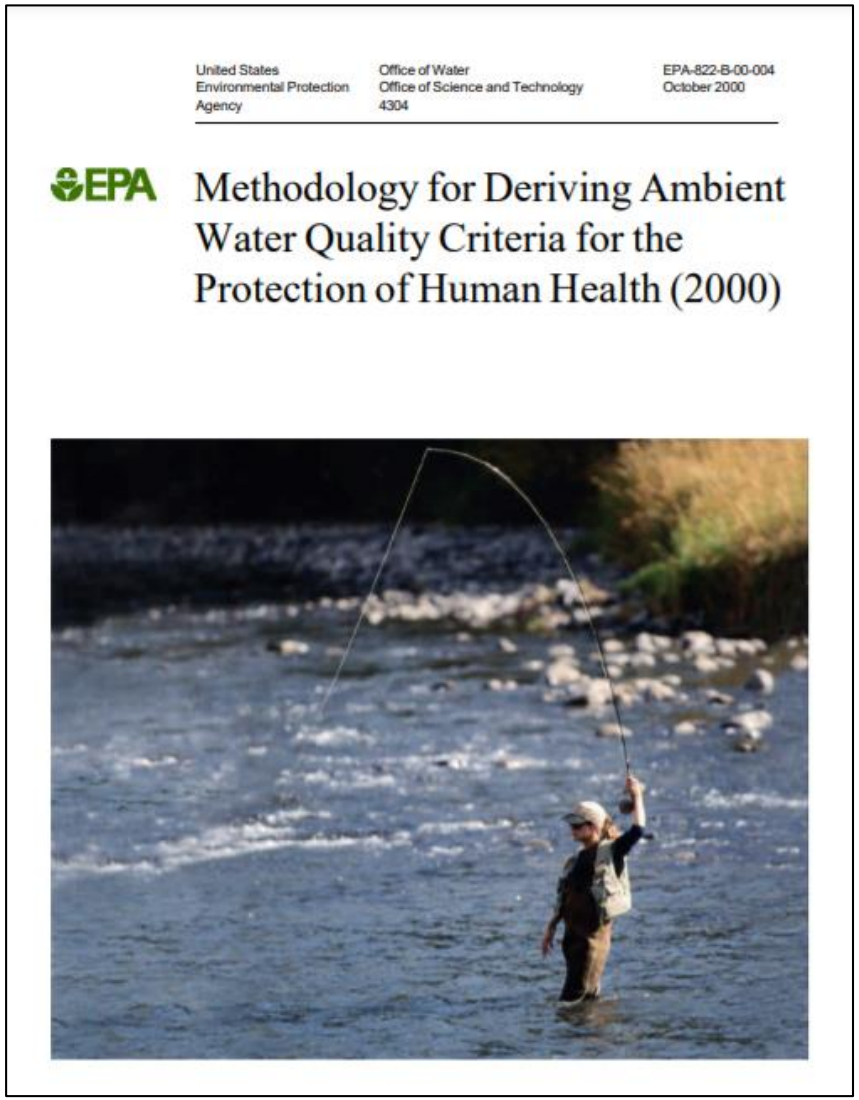

Flexibilities

- Criteria for carcinogens are based on a default 1 in 1,000,000 risk level (10^{-6})
- States can use a more stringent level such as 1 in 10,000,000 (10^{-7})
- States can also use 1 in 100,000 (10^{-5}), as long risk to more highly exposed subgroups does not exceed 1 in 10.000 (10^{-4})

> With AWQC derived for carcinogens based on a linear low-dose extrapolation, the Agency will publish recommended criteria values at a 10^{-6} risk level. States and authorized Tribes can always choose a more stringent risk level, such as 10^{-7}. EPA also believes that criteria based on a 10^{-5} risk level are acceptable for the general population as long as States and authorized Tribes ensure that the risk to more highly exposed subgroups (sportfishers or subsistence fishers) does not exceed the 10^{-4} level. Clarification on this risk management decision is provided in Section 2 of this document.

Criteria for Protection of Consumption of Drinking Water and Aquatic Organisms

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

United States Environmental Protection Agency | Office of Water, Office of Science and Technology, 4304 | EPA-822-B-00-004, October 2000

EPA Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000)

3.2.3.5 Use of Less-Than-90-Day Studies to Derive RfDs

Generally, less-than-90-day experimental studies are not used to derive an RfD. This is based on the rationale that studies lasting for less than 90 days may be too short to detect various toxic effects. However, EPA, has in certain circumstances, derived an RfD based on a less-than-90-day study. For example, the RfD for nonradioactive effects of uranium is based on a 30-day rabbit study (USEPA, 1989). The short-term exposure period was used, because it was adequate for determining doses that cause chronic toxicity. In other cases, it may be appropriate to use a less-than-90-day study because the critical effect is expressed in less than 90 days. For example, the RfD for nitrate was derived and verified using studies that were less than 3-months in duration (USEPA, 1991b). For nitrate, the critical effect of methemoglobinemia in infants occurs in less than 90 days. When it can be demonstrated from other data in the toxicological database that the critical adverse effect is expressed within the study period and that a longer exposure duration would not exacerbate the observed effect or cause the appearance of some other adverse effect, the Agency may choose to use less-than-90-day studies as the basis of the RfD. Such values would have to be used with care because of the uncertainty in determining if other effects might be expressed if exposure was of greater duration than 90 days.

- Reference doses are generally derived from studies conducted for longer than 90 days
- Critical effect of nitrate can occur in less than 90 days

2015 Updates to Criteria

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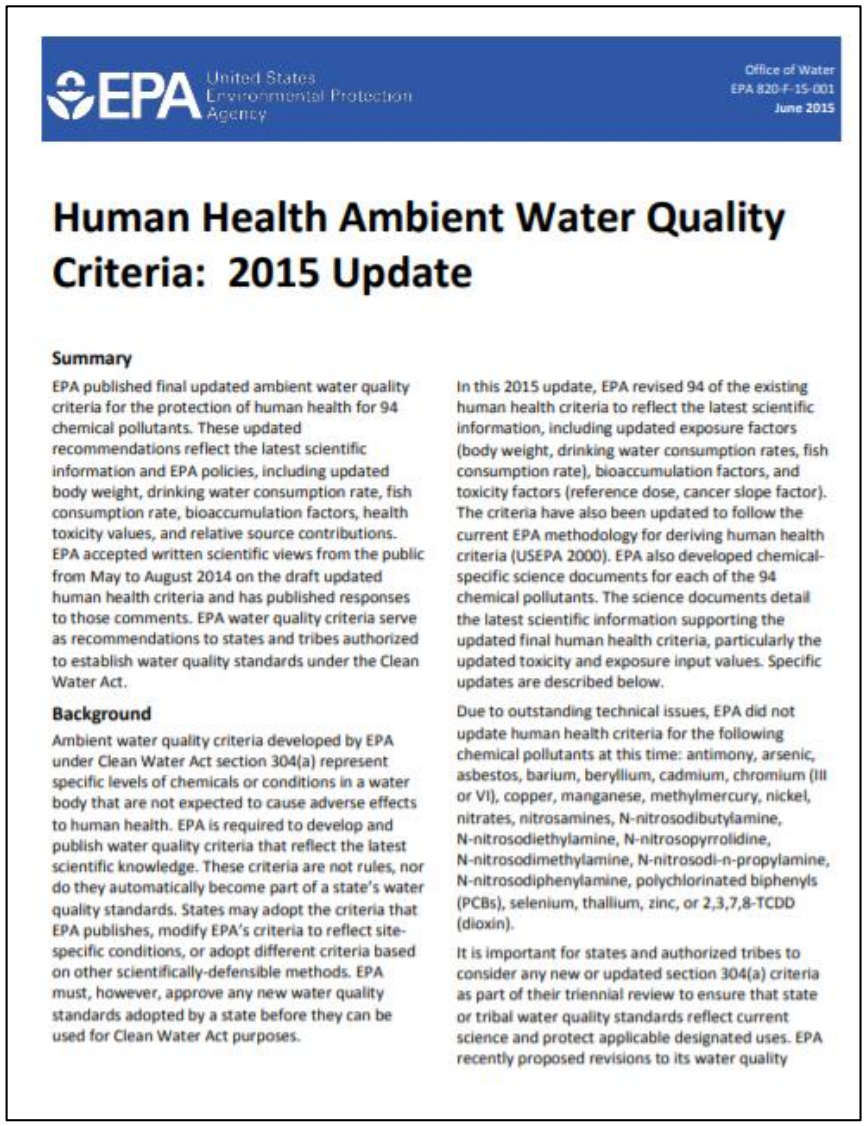


EPA United States Environmental Protection Agency

Office of Water
EPA 820-F-15-001
June 2015

Human Health Ambient Water Quality Criteria: 2015 Update

Summary

EPA published final updated ambient water quality criteria for the protection of human health for 94 chemical pollutants. These updated recommendations reflect the latest scientific information and EPA policies, including updated body weight, drinking water consumption rate, fish consumption rate, bioaccumulation factors, health toxicity values, and relative source contributions. EPA accepted written scientific views from the public from May to August 2014 on the draft updated human health criteria and has published responses to those comments. EPA water quality criteria serve as recommendations to states and tribes authorized to establish water quality standards under the Clean Water Act.

Background

Ambient water quality criteria developed by EPA under Clean Water Act section 304(a) represent specific levels of chemicals or conditions in a water body that are not expected to cause adverse effects to human health. EPA is required to develop and publish water quality criteria that reflect the latest scientific knowledge. These criteria are not rules, nor do they automatically become part of a state's water quality standards. States may adopt the criteria that EPA publishes, modify EPA's criteria to reflect site-specific conditions, or adopt different criteria based on other scientifically-defensible methods. EPA must, however, approve any new water quality standards adopted by a state before they can be used for Clean Water Act purposes.

In this 2015 update, EPA revised 94 of the existing human health criteria to reflect the latest scientific information, including updated exposure factors (body weight, drinking water consumption rates, fish consumption rate), bioaccumulation factors, and toxicity factors (reference dose, cancer slope factor). The criteria have also been updated to follow the current EPA methodology for deriving human health criteria (USEPA 2000). EPA also developed chemical-specific science documents for each of the 94 chemical pollutants. The science documents detail the latest scientific information supporting the updated final human health criteria, particularly the updated toxicity and exposure input values. Specific updates are described below.

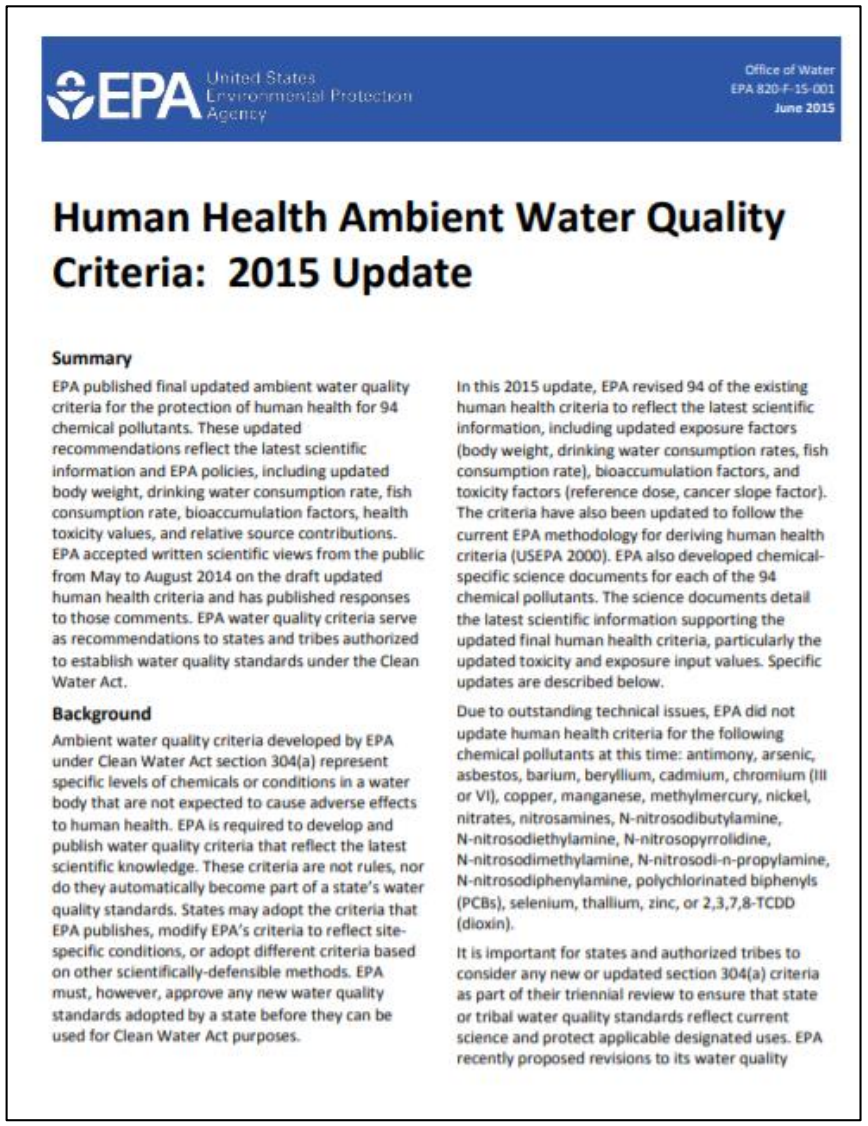
Due to outstanding technical issues, EPA did not update human health criteria for the following chemical pollutants at this time: antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium (III or VI), copper, manganese, methylmercury, nickel, nitrates, nitrosamines, N-nitrosodibutylamine, N-nitrosodiethylamine, N-nitrosopyrrolidine, N-nitrosodimethylamine, N-nitrosodi-n-propylamine, N-nitrosodiphenylamine, polychlorinated biphenyls (PCBs), selenium, thallium, zinc, or 2,3,7,8-TCDD (dioxin).

It is important for states and authorized tribes to consider any new or updated section 304(a) criteria as part of their triennial review to ensure that state or tribal water quality standards reflect current science and protect applicable designated uses. EPA recently proposed revisions to its water quality

- Updated recommendations for 94 pollutants
  - Fish consumption rate
    - 17.5 grams (0.62 ounces) per day to 22 grams (0.78 ounces) per day
  - Drinking water consumption rate
    - 2.0 liters per day to 2.4 liters per day
  - Body weight
    - 70 kg (154 lbs) to 80 kg (176 lbs)
  - Health toxicity values
    - Carcinogens and noncarcinogens
  - Relative source contribution factors
  - Bioaccumulation factors
    - Pollutant specific

2015 Updates to Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY



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- Updated recommendations for 94 pollutants
  - 3 new pollutants
  - Some are more stringent
  - Some are less stringent
  - Comparison Table

Wyoming Water Quality Standards

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

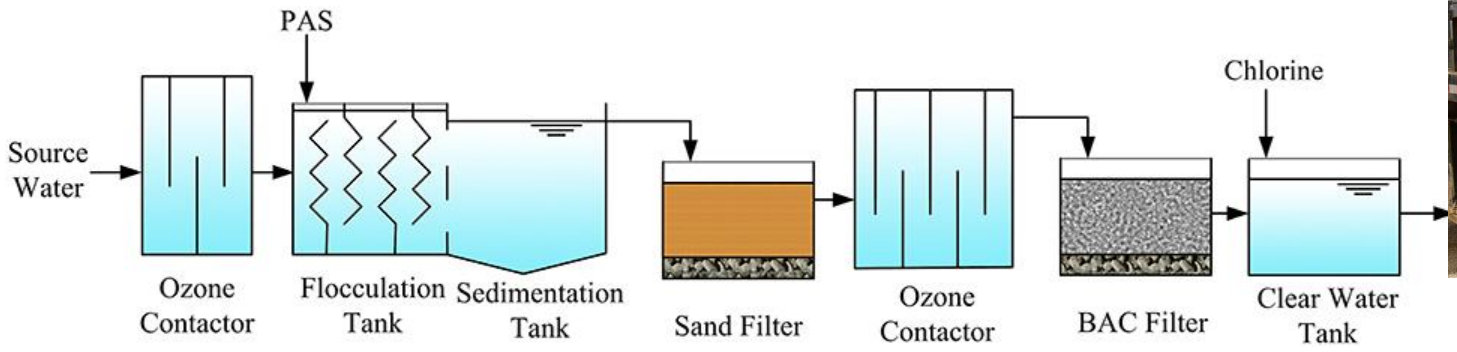
“Human Health” Uses and Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Drinking Water and Fish Consumption Uses

(d) Drinking water. The drinking water use involves maintaining a level of water quality that is suitable for potable water or intended to be suitable after receiving conventional drinking water treatment.

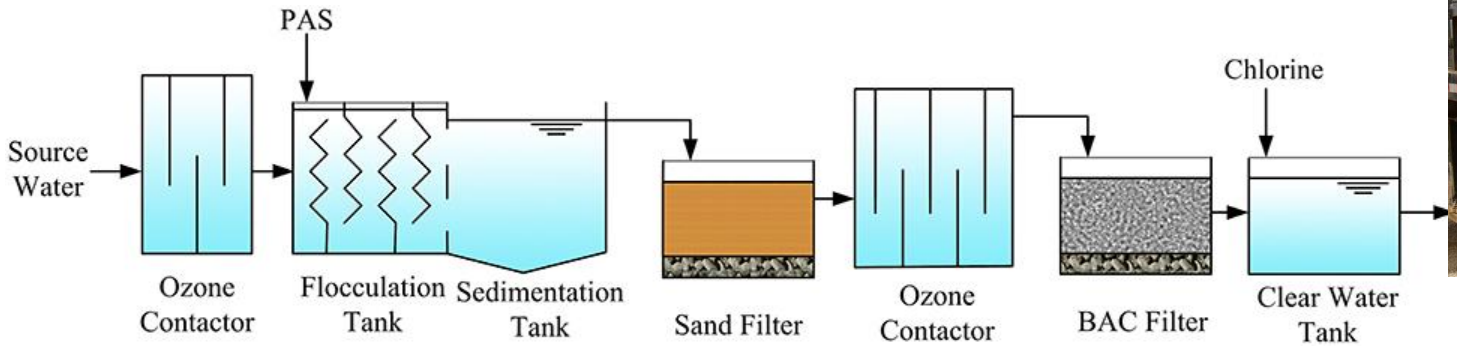
(i) Fish consumption. The fish consumption use involves maintaining a level of water quality that will prevent any unpalatable flavor and/or accumulation of harmful substances in fish tissue.



Human Health Criteria

Section 18. Human Health. In all Class 1, 2AB and 2A waters, the "Human Health Consumption of Fish and Drinking Water" values listed in Appendix B of these regulations shall not be exceeded. In all Class 2B, 2C and 2D waters, the "Human Health Consumption of Fish" (consumption of aquatic organisms) values shall not be exceeded.

In certain waters, the criteria listed in Appendix B of these regulations may not be appropriate due to unique physical or chemical conditions. In such cases, human health values may be established using the site-specific procedures outlined in the references listed in Appendix E or other scientifically defensible methods.



Human Consumption of Fish and Drinking Water

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Appendix B

Water Quality Criteria[1]

(a) Priority Pollutants.

Priority Pollutant	Aquatic Life		Human Health Consumption of	
	Acute Value (µg/L)	Chronic Value (µg/L)	Fish and Drinking Water[2] (µg/L)	Fish[8] (µg/L)
Acenaphthene			20[7]	990
Acrolein	3	3	6	9
Acrylonitrile			0.051[3]	0.25[3]
Benzene			2.2[3]	51[3]
Benzidine			0.000086[3]	0.00020[3]
Carbon tetrachloride (Tetrachloromethane)			0.23[3]	1.6[3]
Chlorobenzene (Monochlorobenzene)			20[7]	1,600
1,2,4-Trichlorobenzene			35	70
Hexachlorobenzene			0.00028[3]	0.00029[3]

Nationally Recommended Water Quality Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

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National Recommended Water Quality Criteria – Human Health Criteria Table

Human health ambient water quality criteria represent specific levels of chemicals or conditions in a water body that are not expected to cause adverse effects to human health. EPA provides recommendations for "water + organism" and "organism only" human health criteria for states and authorized tribes to consider when adopting criteria into their water quality standards. These hu
the Clean Water Act.

Related Information

- Human Health Criteria Calculation

Select pollutant name for

Appendix B is derived from EPA Recommendations (Pre-2015 Updates)

Pollutant

Pollutant	CAS Number	Human Health for the consumption of Water + Organism (µg/L)	Human Health for the consumption of Organism Only (µg/L)	Publication Year	Notes
					The criterion for organoleptic (taste and

Human Consumption of Fish and Drinking Water

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Appendix B

Water Quality Criteria[1]

(a) Priority Pollutants.

Priority Pollutant	Aquatic Life		Human Health Consumption of	
	Acute Value (µg/L)	Chronic Value (µg/L)	Fish and Drinking Water[2] (µg/L)	Fish[8] (µg/L)
Acenaphthene			20[7]	990
Acrolein	3	3	6	9
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Chlorobenzene (Monochlorobenzene)			20[7]	1,600
1,2,4-Trichlorobenzene			35	70
Hexachlorobenzene			0.00028[3]	0.00029[3]

Exceptions:

- Arsenic
- Mercury
- Barium

Drinking Water and Fish Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Appendix B

Water Quality Criteria[1]

(a) Priority Pollutants.

Priority Pollutant	Aquatic Life		Human Health Consumption of	
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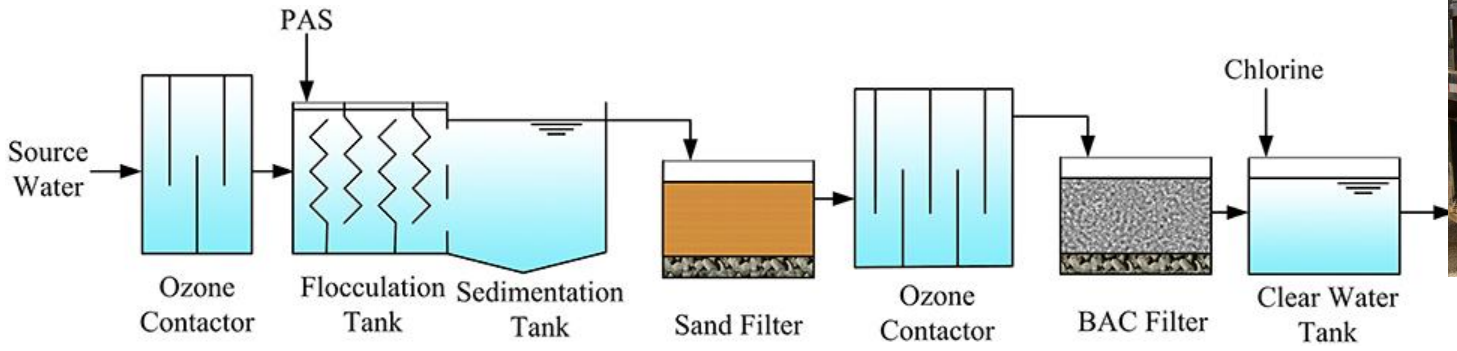
Drinking Water and Fish Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

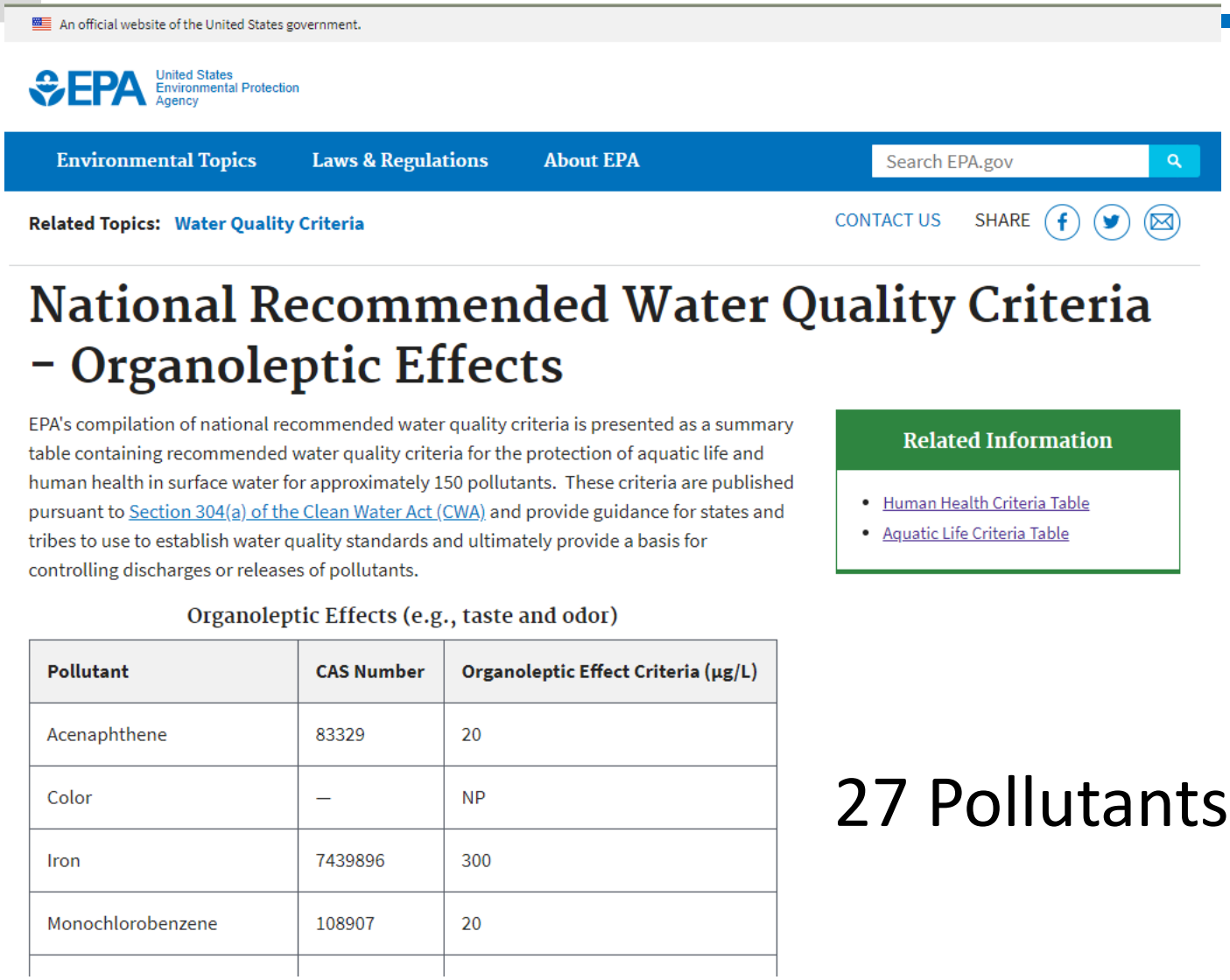
Human Health Consumption of Drinking Water and Fish Footnotes

(7)Criterion is based on organoleptic (taste and odor) effects and is more stringent than if based solely on toxic or carcinogenic effects.



Nationally Recommended Water Quality Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY



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National Recommended Water Quality Criteria – Organoleptic Effects

EPA's compilation of national recommended water quality criteria is presented as a summary table containing recommended water quality criteria for the protection of aquatic life and human health in surface water for approximately 150 pollutants. These criteria are published pursuant to Section 304(a) of the Clean Water Act (CWA) and provide guidance for states and tribes to use to establish water quality standards and ultimately provide a basis for controlling discharges or releases of pollutants.

Related Information

- Human Health Criteria Table
- Aquatic Life Criteria Table

Organoleptic Effects (e.g., taste and odor)

Pollutant	CAS Number	Organoleptic Effect Criteria (µg/L)
Acenaphthene	83329	20
Color	—	NP
Iron	7439896	300
Monochlorobenzene	108907	20

27 Pollutants

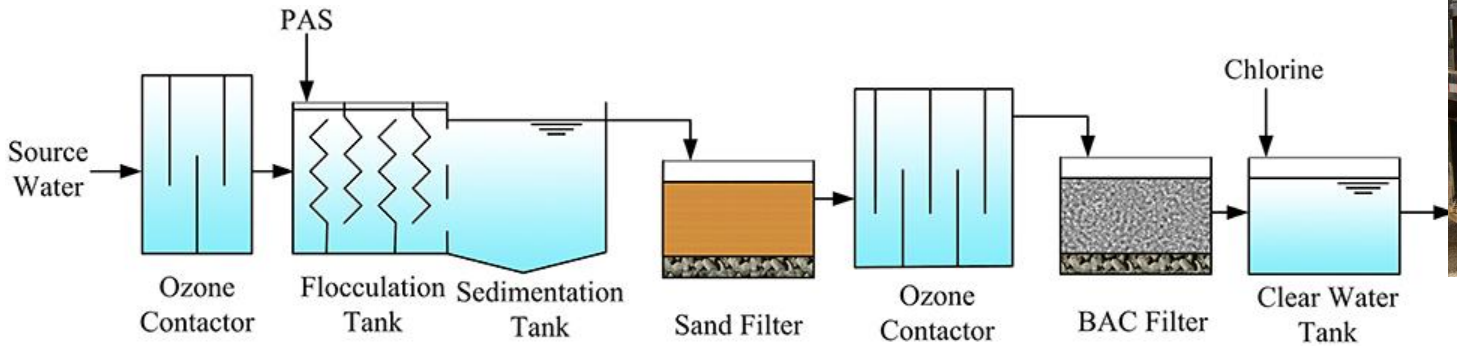
- Developed to protect against taste and odor

Drinking Water and Fish Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Human Health Consumption of Drinking Water and Fish Footnotes

[9]Criterion is based on an EPA drinking water standard (maximum contaminant level or MCL).



Safe Drinking Water Act

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

National Primary Drinking Water Regulations

EPA

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[2] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
Acrylamide	TT[3]	Nervous system or blood problems; increased risk of cancer	Added to water during sewage/ wastewater treatment	zero
Alachlor	0.002	Eye, liver, kidney, or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops	zero
Alpha/photon emitters	15 picocuries per Liter (pCi/L)	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation	zero
Antimony	0.006	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	0.006
Arsenic	0.010	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer	Erosion of natural deposits; runoff from orchards; runoff from glass & electronics production wastes	0
Asbestos (fibers >10 micrometers)	7 million fibers per Liter (MFL)	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits	7 MFL
Atrazine	0.003	Cardiovascular system or reproductive problems	Runoff from herbicide used on row crops	0.003
Barium	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	2
Benzene	0.005	Anemia; decrease in blood platelets; increased risk of cancer	Discharge from factories; leaching from gas storage tanks and landfills	zero
Benzo(a)pyrene (PAHs)	0.0002	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines	zero
Beryllium	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries	0.004
Beta photon emitters	4 millirems per year	Increased risk of cancer	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit forms of radiat	zero
Bromate	0.010	Increased risk of cancer	Byprо disinf	
Cadmium	0.005	Kidney damage	Corro of nat from waste	
Carbofuran	0.04	Problems with blood, nervous system, or reproductive system	Leach and a	

LEGEND: DISINFECTANT, DISINFECTION BYPRODUCT, INORGANIC CHEMICAL, MICROORGA… CHEMICAL

- National Primary Drinking Water Regulations
- After treatment requirements for public water systems
- Legally-enforceable standards
- Protect public health by limiting levels of specific contaminants known to cause health effects and are expected to occur in public water systems
- Maximum contaminant levels (MCLs) or treatment technique rules (TT)

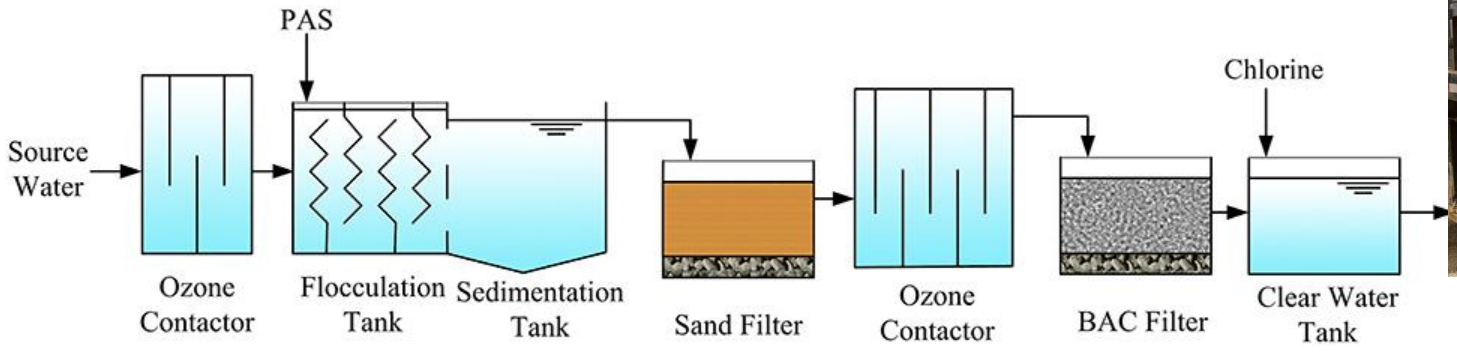
83 Pollutants

Drinking Water and Fish Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

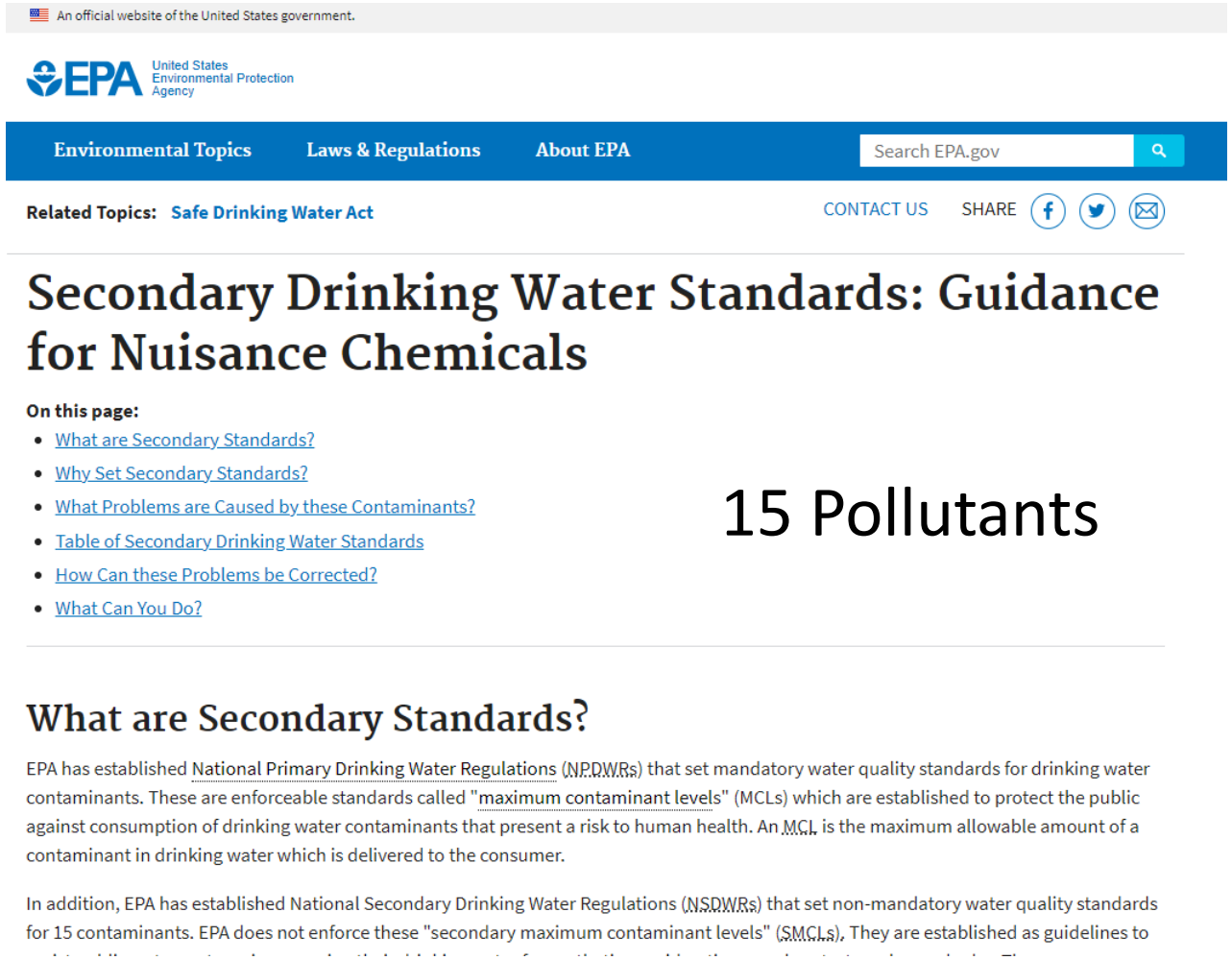
Human Health Consumption of Drinking Water and Fish Footnotes

(11) Criterion is based on Safe Drinking Water Act secondary standards and is intended to prevent undesirable cosmetic or aesthetic effects. Value represents the dissolved amount of each substance rather than the total amount. Criterion only applies where drinking water is an actual use.



Safe Drinking Water Act

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY



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Secondary Drinking Water Standards: Guidance for Nuisance Chemicals

On this page:

- What are Secondary Standards?
- Why Set Secondary Standards?
- What Problems are Caused by these Contaminants?
- Table of Secondary Drinking Water Standards
- How Can these Problems be Corrected?
- What Can You Do?

15 Pollutants

What are Secondary Standards?

EPA has established National Primary Drinking Water Regulations (NPDWRs) that set mandatory water quality standards for drinking water contaminants. These are enforceable standards called "maximum contaminant levels" (MCLs) which are established to protect the public against consumption of drinking water contaminants that present a risk to human health. An MCL is the maximum allowable amount of a contaminant in drinking water which is delivered to the consumer.

In addition, EPA has established National Secondary Drinking Water Regulations (NSDWRs) that set non-mandatory water quality standards for 15 contaminants. EPA does not enforce these "secondary maximum contaminant levels" (SMCLs). They are established as guidelines to

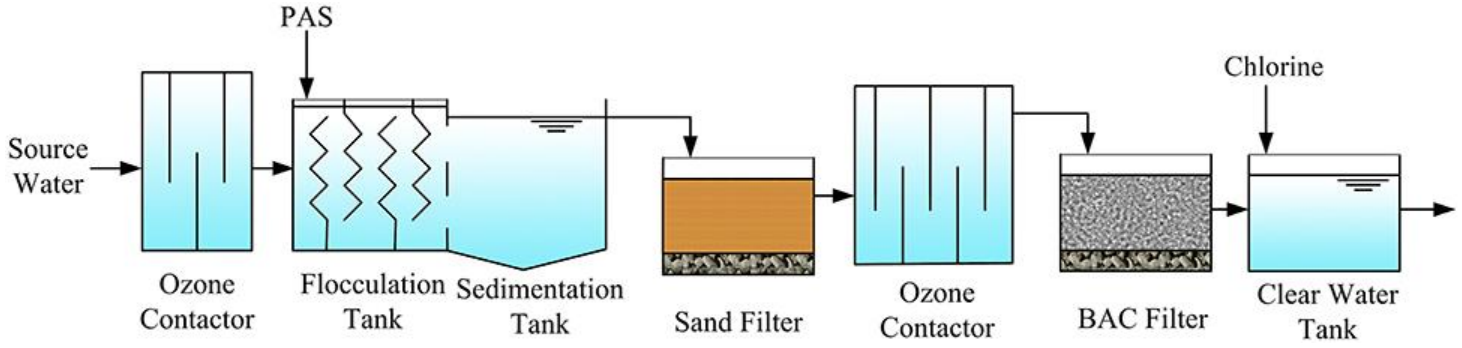
- National Secondary Drinking Water Standards

- Non-mandatory
  - Voluntary monitoring

- Guidelines to assist public water systems in managing
  - Aesthetic: tastes, odors, colors
  - Cosmetic: discoloration of teeth or skin
  - Technical: damage to equipment or reduce treatment effectiveness for other contaminants

Drinking Water and Fish Consumption Criteria

- EPA Clean Water Act Section 304(a) water quality criteria recommendations for protection of consumption of drinking water and aquatic organims
- EPA Clean Water Act Section 304(a) water quality criteria for recommendations for protection of organoleptic (taste and odor) effects
- Safe Drinking Water Act Maximum Contaminant Levels
- Safe Drinking Water Act Secondary Standards (Undesirable cosmetic or aesthetic effects)



Drinking Water and Fish Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Appendix B

Water Quality Criteria[1]

(a) Priority Pollutants.

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Benzidine			0.000086[3]	0.00020[3]
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1,2,4-Trichlorobenzene			35	70
Hexachlorobenzene			0.00028[3]	0.00029[3]

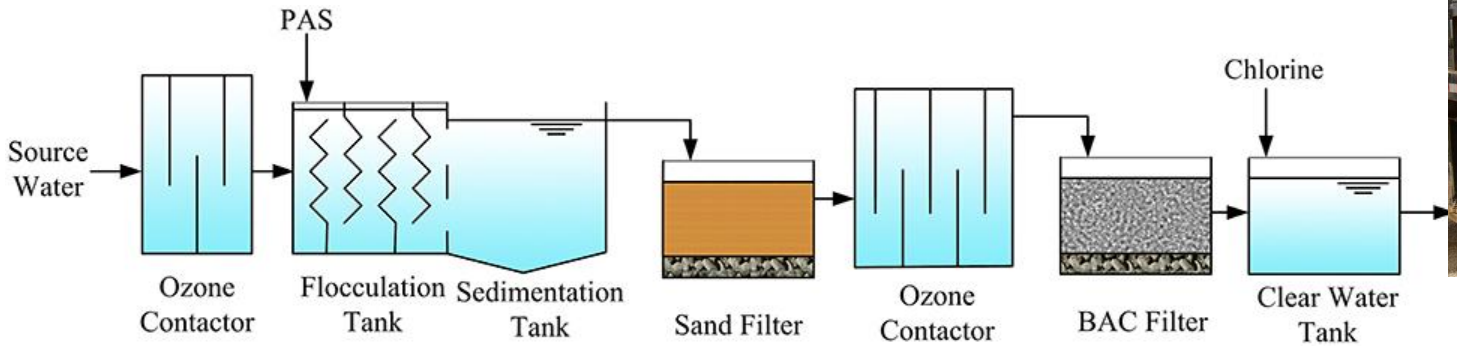
Drinking Water and Fish Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Human Health Consumption of Drinking Water and Fish Footnotes

[3]Except for arsenic, the substance is classified as a carcinogen with the value based on an incremental risk of one additional instance of cancer in one million persons. Arsenic is classified as a carcinogen, however, the value is not based on an additional 1:1,000,000 cancer risk.

10^{-6} 1/1,000,000



Human Consumption of Fish and Drinking Water

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Appendix B

Water Quality Criteria[1]

(a) Priority Pollutants.

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Drinking Water and Fish Consumption Criteria

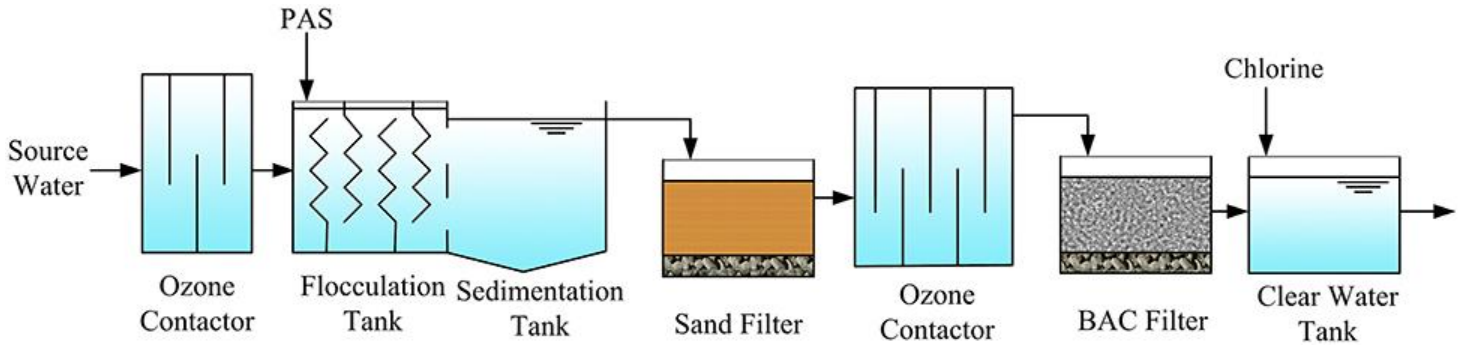
WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Human Consumption of Drinking Water and Fish Footnotes

[2]Except where otherwise indicated, these values are based on EPA Section 304(a) criteria recommendations assuming consumption of 2 liters of water and 17.5 grams of aquatic organisms per day.

Human Consumption of Aquatic Organisms

[8]EPA Section 304(a) human health criteria recommendation assuming consumption of contaminated aquatic organisms at a rate of 17.5 grams per day.



Section 22. Radioactive Material

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Section 22. Radioactive Material.

(a) In Class 1, 2AB and 2A waters, radiological limits of 5 pCi/L for combined radium-226 and radium-228, 15 pCi/L for gross alpha particle activity (excluding radon and uranium), 30 µg/L for uranium and 4 millirems per year (mrem/year) for beta particle and photon radioactivity shall not be exceeded.

(b) In Class 2B, 2C, 2D, 3 and 4 waters, the total radium-226 concentration shall not exceed 60 pCi/L.

(c) In all Wyoming surface waters, radioactive materials attributable or influenced by the activities of man shall not be present in the water or in the sediments in amounts which could cause harmful accumulations of radioactivity in plant, wildlife, livestock or aquatic life.

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WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

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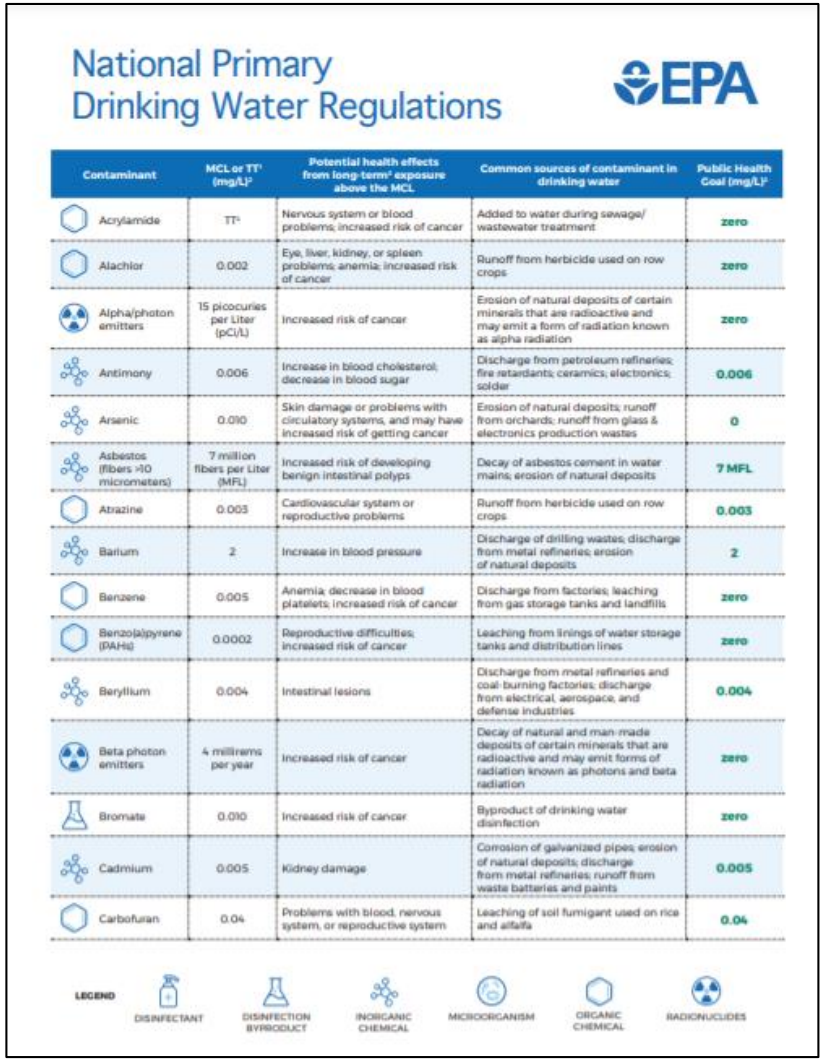

National Primary Drinking Water Regulations

EPA

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
Acrylamide	TT[4]	Nervous system or blood problems; increased risk of cancer	Added to water during sewage/ wastewater treatment	zero
Alachlor	0.002	Eye, liver, kidney, or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops	zero
Alpha/photon emitters	15 picocuries per Liter (pCi/L)	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation	zero
Antimony	0.006	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	0.006
Arsenic	0.010	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer	Erosion of natural deposits; runoff from orchards; runoff from glass & electronics production wastes	0
Asbestos (fibers >10 micrometers)	7 million fibers per Liter (MFL)	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits	7 MFL
Atrazine	0.003	Cardiovascular system or reproductive problems	Runoff from herbicide used on row crops	0.003
Barium	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	2
Benzene	0.005	Anemia; decrease in blood platelets; increased risk of cancer	Discharge from factories; leaching from gas storage tanks and landfills	zero
Benzo(a)pyrene (PAHs)	0.0002	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines	zero
Beryllium	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries	0.004
Beta photon emitters	4 millirems per year	Increased risk of cancer	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit forms of radiation known as photons and beta radiation	zero
Bromate	0.010	Increased risk of cancer	Byproduct of drinking water disinfection	zero
Cadmium	0.005	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints	0.005
Carbofuran	0.04	Problems with blood, nervous system, or reproductive system	Leaching of soil fumigant used on rice and alfalfa	0.04

LEGEND: DISINFECTANT; DISINFECTION BYPRODUCT; INORGANIC CHEMICAL; MICROORGANISM; ORGANIC CHEMICAL; RADIONUCLIDES

Drinking Water Narrative Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Examples from Other States

- Idaho
- Colorado
- Indiana
- New Mexico

Examples from Other States

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

- Idaho
- Colorado
- Indiana
- New Mexico

Idaho Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

b. Table 2 contains criteria set for 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. (3-28-18)

Table 2. Criteria for Protection of Human Health (based on consumption of:)

Compound	a CAS Number	Carcinogen?	Water & Fish (µg/L)		Fish Only (µg/L)	
Anthracene	120127		110	b	120	b
alpha-BHC	319846	Y	0.0012	bf	0.0013	bf
beta-BHC	319857	Y	0.036	bf	0.045	bf
gamma-BHC (Lindane)	58899		1.4	b	1.4	b
delta-BHC	319868			e		e
Benzene	71432		3.0	bf	28	b
Benzidine	92875	Y	0.0014	bf	0.033	bf
Benzo(a)Anthracene	56553	Y	0.0042	bf	0.0042	bf
Benzo(b)Fluoranthene	205992	Y	0.0042	bf	0.0042	bf
Benzo(k)Fluoranthene	207089	Y	0.042	bf	0.042	bf
Benzo(ghi)Perylene	191242			e		e
Benzo(a)Pyrene	50328	Y	0.00042	bf	0.00042	bf

Idaho Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

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Benzo(k)Fluoranthene	207089	Y	0.042	bf	0.042	bf
Benzo(ghi)Perylene	191242			e		e
Benzo(a)Pyrene	50328	Y	0.00042	bf	0.00042	bf

Idaho Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

IDAHO ADMINISTRATIVE CODE
Department of Environmental Quality

IDAPA 58.01.02
Water Quality Standards

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Benzo(a)Anthracene	56553	Y	0.0042	bf	0.0042	bf
Benzo(a)Pyrene	50328	Y	0.00042	bf	0.00042	bf

Footnotes for Table 2. Criteria for Protection of Human Health

a. Chemical Abstracts Service (CAS) registry numbers which provide a unique identification for each chemical.

Idaho Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

IDAHO ADMINISTRATIVE CODE
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delta-BHC	319868			e		e
Benzene	71432		3.0	bf	28	b
Benzidine	92875	Y	0.0014	bf	0.033	bf
Benzo(a)Anthracene	56553	Y	0.0042	bf	0.0042	bf
Benzo(b)Fluoranthene	205992	Y	0.0042	bf	0.0042	bf
Benzo(k)Fluoranthene	207089	Y	0.042	bf	0.042	bf
Benzo(ghi)Perylene	191242			e		e
Benzo(a)Pyrene	50328	Y	0.00042	bf	0.00042	bf

Idaho Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

IDAHO ADMINISTRATIVE CODE
Department of Environmental Quality

IDAPA 58.01.02
Water Quality Standards

Table 2. Criteria for Protection of Human Health (based on consumption of:)

Compound	[a] CAS Number	Carcinogen?	Water & Fish (µg/L)		Fish Only (µg/L)	
Anthracene	120127		110	b	120	b
alpha-BHC	319846	Y	0.0012	bf	0.0013	bf
beta-BHC	319857	Y	0.036	bf	0.045	bf
gamma-BHC (Lindane)	58899		1.4	b	1.4	b
delta-BHC	319868			e		e
Benzene	71432		3.0	bf	28	b
Benzidine	92875	Y	0.0014	bf	0.033	bf
Benzo(a)Anthracene	56553	Y	0.0042	bf	0.0042	bf
Benzo(b)Fluoranthene	205992	Y	0.0042	bf	0.0042	bf
Benzo(k)Fluoranthene	207089	Y	0.042	bf	0.042	bf
Benzo(ghi)Perylene	191242			e		e
Benzo(a)Pyrene	50328	Y	0.00042	bf	0.00042	bf

Idaho Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

IDAHO ADMINISTRATIVE CODE
Department of Environmental Quality

IDAPA 58.01.02
Water Quality Standards

Table 2. Criteria for Protection of Human Healt

Compound	a CAS Number	Carcinoge
Anthracene	120127	
alpha-BHC	319846	Y
beta-BHC	319857	Y
gamma-BHC (Lindane)	58899	
delta-BHC	319868	
Benzene	71432	
Benzidine	92875	Y
Benzo(a)Anthracene	56553	Y
Benzo(b)Fluoranthene	205992	Y
Benzo(k)Fluoranthene	207089	Y
Benzo(ghi)Perylene	191242	
Benzo(a)Pyrene	50328	Y

b. This criterion is based on input values to human health criteria calculation specified in Idaho's Technical Support Document (TSD) for Human Health Criteria Calculations - 2015. Criteria for non-carcinogens are calculated using the formula:

$$AWQC = RfD * RSC * \left(\frac{BW}{DI + (FI * BAF)}\right)$$

and criteria for carcinogens are calculated using the formula:

$$AWQC = RSD * \left(\frac{BW}{DI + (FI * BAF)}\right)$$

Where:
AWQC = Ambient water quality criterion (mg/L)

BW = Human Body Weight (kg), 80 is used in these criteria
DI = Drinking Water Intake, (L/day), 2.4 is used in these criteria
FI = Fish Intake, (kg/day), 0.0665 is used in these criteria

2015 criteria

Idaho specific number

BAF = Bioaccumualtion Factor, L/kg, chemical specific value, see TSD
RfD = Reference dose (mg/kg-day), chemical specific value, see TSD

$$RSD = \frac{\text{Target Incremental Cancer Risk}}{\text{Cancer Potency Factor}}$$ (mg/kg-day), chemical specific value, see TSD

RSC = Relative Source Contribution, chemical specific value, see TSD

Idaho Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

b. Human Health Criteria. (4-5-00)

i. When numeric criteria for the protection of human health are not identified in these rules for toxic substances, quantifiable criteria may be derived by the Department using best available science on toxicity thresholds (i.e. reference dose or cancer slope factor), such as defined in EPA's Integrated Risk Information System (IRIS) or other peer-reviewed source acceptable to the Department. (3-25-16)

ii. When using toxicity thresholds to derive water quality criteria to protect human health, a fish consumption rate representative of the population to be protected, a mean adult body weight, an adult 90th percentile water ingestion rate, a trophic level weighted BAF or BCF, and a hazard quotient of one (1) for non-carcinogens or a cancer risk level of 10^{-5} for carcinogens shall be utilized. (3-25-16)

Idaho Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

IDAHO ADMINISTRATIVE CODE ***IDAPA 58.01.02***
Department of Environmental Quality ***Water Quality Standards***

Table 2. Criteria for Protection of Human Health (based on consumption of:)

Compound	[a] CAS Number	Carcinogen?	Water & Fish (µg/L)		Fish Only (µg/L)	
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beta-BHC	319857	Y	0.036	bf	0.045	bf
gamma-BHC (Lindane)	58899		1.4	b	1.4	b
delta-BHC	319868			e		e
Benzo(b)Fluoranthene	205992	Y	0.0042	bf	0.0042	bf
Benzo(k)Fluoranthene	207089	Y	0.042	bf	0.042	bf
Benzo(ghi)Perylene	191242			e		e
Benzo(a)Pyrene	50328	Y	0.00042	bf	0.00042	bf

f. EPA guidance allows states to choose from a range of 10^{-4} to 10^{-6} for the incremental increase in cancer risk used in human health criteria calculation. Idaho has chosen to base this criterion on carcinogenicity of 10^{-5} risk.

Idaho Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

b. Table 2 contains criteria set for 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. (3-28-18)

Table 2. Criteria for Protection of Human Health (based on consumption of:)

Compound	[a] CAS Number	Carcinogen?	Water & Fish (µg/L)		Fish Only (µg/L)	
Inorganic Compounds/Metals						
Antimony	7440360		5.2	b	190	b
Arsenic	7440382	Y	10	cdj	10	cdj

Note: In 2008, Idaho adopted 10 µg/L as its CWA arsenic criterion for both exposure through fish consumption only and exposure through drinking water+fish consumption, choosing the SDWA MCL due to concerns about background levels that exceed EPA's 304(a) criteria (docket 58-0102-0801). EPA approved this action in 2010. In June 2015, Northwest Environmental Advocates challenged EPA's 2010 approval. Court remanded action back to EPA. On September 15, 2016, EPA disapproved Idaho's adoption of10 µg/L. Neither EPA nor the state of Idaho has promulgated replacement criteria. For more information, go to http://www.deq.idaho.gov/epa-actions-on-proposed-standards.

Idaho Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

b. Table 2 contains criteria set for 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. (3-28-18)

Table 2. Criteria for Protection of Human Health (based on consumption of:)

Compound	a CAS Number	Carcinogen?	Water & Fish (µg/L)		Fish Only (µg/L)	
Inorganic Compounds/Metals						
Antimony	7440360		5.2	b	190	b
Arsenic	7440382	Y	10	cdj	10	cdj

Note: In 2008, Idaho adopted 10 µg/L as its CWA arsenic criterion for both exposure through fish consumption only and exposure through drinking water+fish consumption, choosing the SDWA MCL due to concerns about

j. This criterion is based on the drinking water Maximum Containment Level (MCL).

EPA. On September 15, 2016, EPA disapproved Idaho's adoption of10 µg/L. Neither EPA nor the state of Idaho has promulgated replacement criteria. For more information, go to http://www.deq.idaho.gov/epa-actions-on-proposed-standards.

Idaho Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

d. Application of toxics criteria. (3-25-16)

i. Frequency and duration for aquatic life toxics criteria. CMC column criteria in Table 1 in Subsection 210.01 are concentrations not to be exceeded for a one-hour average more than once in three (3) years unless otherwise specified. CCC column criteria in Table 1 in Subsection 210.01 are concentrations not to be exceeded for a four-day average more than once in three (3) years unless otherwise specified. (3-28-18)

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 mean. (3-28-18)

Examples from Other States

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

- Idaho
- Colorado
- Indiana
- New Mexico

Colorado Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

CODE OF COLORADO REGULATIONS ***5 CCR 1002-31***
Water Quality Control Commission

BASIC STANDARDS FOR ORGANIC CHEMICALS

(in micrograms per liter)

Parameter		Human Health Based[1]			Aquatic Life Based[4]	
	CAS No.	Water Supply[2]	Water+Fish[3]	Fish Ingestion[8]	Acute	Chronic
Trichloroethane 1,1,2 (1,1,2-TCA)[11, 12]	79-00-5	2.8 to 5[M]	2.7	71	9,400	---
Trichloroethylene (TCE)[C]	79-01-6	5[M]	2.5	30	45,000	21,900
Trichloropropane 1,2,3[C, 13]	96-18-4	3.7E-4	---	---	---	---
Trichlorophenol 2,4,5	95-95-4	700	700	3,600	---	---
Trichlorophenol 2,4,6[C]	88-06-2	3.2	1.4	2.4	---	970
Trichlorophenoxypropionic acid (2,4,5-tp) (Silvex)	93-72-1	50[M]	---	---	---	---
Total Trihalomethanes (HMs)	(total)[7]	80	80	---	---	---
Trimethylbenzene 1,2,3	526-73-8	67	---	---	---	---
Trimethylbenzene 1,2,4	95-63-6	67	---	---	---	---
Trimethylbenzene 1,3,5	108-67-8	67	---	---	---	---
Vinyl Chloride[C, 12]	75-01-4	0.023 to 2[M]	0.023	2.3	---	---
Xylenes (total)[12]	1330-20-7	1,400 to 10,000[M]	---	---	---	---

Colorado Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

CODE OF COLORADO REGULATIONS
Water Quality Control Commission

5 CCR 1002-31

BASIC STANDARDS FOR ORGANIC CHEMICALS

(in micrograms per liter)

Parameter		Human Health Based[1]			Aquatic Life Based[4]	
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Trichloroethylene (TCE)[C]	79-01-6	5[M]	2.5	30	45,000	21,900
Trichloropropane 1,2,3[C, 13]	96-18-4	3.7E-4	---	---	---	---
Trichlorophenol 2,4,5	95-95-4	700	700	3,600	---	---
Trichlorophenol 2,4,6[C]	88-06-2	3.2	1.4	2.4	---	970
Trichlorophenoxypropionic acid (2,4,5-tp) (Silvex)	93-72-1	50[M]	---	---	---	---
Trimethylbenzene 1,3,5	108-67-8	67	---	---	---	---
Vinyl Chloride[C, 12]	75-01-4	0.023 to 2[M]	0.023	2.3	---	---
Xylenes (total)[12]	1330-20-7	1,400 to 10,000[M]	---	---	---	---

1 All standards are chronic or 30-day standards. They are based on information contained in EPA's Integrated Risk Information System (IRIS) and/or EPA lifetime health advisories for drinking water using a 10^{-6} incremental risk factor unless otherwise noted.

Colorado Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

CODE OF COLORADO REGULATIONS
Water Quality Control Commission

5 CCR 1002-31

BASIC STANDARDS FOR ORGANIC CHEMICALS

(in micrograms per liter)

Parameter		Human Health Based[1]			Aquatic Life Based[4]	
	CAS No.	Water Supply[2]	Water+Fish[3]	Fish Ingestion[8]	Acute	Chronic
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Trichloroethylene (TCE)[C]	79-01-6	5[M]	2.5	30	45,000	21,900
Trichloropropane 1,2,3[C, 13]	96-18-4	3.7E-4	---	---	---	---
Trichlorophenol 2,4,5	95-95-4	700	700	3,600	---	---
Trichlorophenol 2,4,6[C]	88-06-2	3.2	1.4	2.4	---	970
Trichlorophenoxypropionic acid (2,4,5-tp) (Silvex)	93-72-1	50[M]	---	---	---	---
Total Trihalomethanes (HMs)	(total)[7]	80	80	---	---	---
Trimethylbenzene 1,2,3	526-73-8	67	---	---	---	---
Trimethylbenzene 1,2,4	95-63-6	67	---	---	---	---
Trimethylbenzene 1,3,5	108-67-8	67	---	---	---	---
Vinyl Chloride[C, 12]	75-01-4	0.023 to 2[M]	0.023	2.3	---	---
Xylenes (total)[12]	1330-20-7	1,400 to 10,000[M]	---	---	---	---

Colorado Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

CODE OF COLORADO REGULATIONS
Water Quality Control Commission

5 CCR 1002-31

BASIC STANDARDS FOR ORGANIC CHEMICALS

(in micrograms per liter)

Parameter		Human Health Based[1]			Aquatic Life Based[4]	
	CAS No.	Water Supply[2]	Water+Fish[3]	Fish Ingestion[8]	Acute	Chronic
Trichloroethane 1,1,2 (1,1,2-TCA)[11, 12]	79-00-5	2.8 to 5[M]	2.7	71	9,400	---
Trichloroethylene (TCE)[C]	79-01-6	5[M]	2.5	30	45,000	21,900
Trichloropropane 1,2,3[C, 13]	96-18-4	3.7E-4	---	---	---	---
Trichlorophenol 2,4,5	95-95-4	700	700	3,600	---	---
Trichlorophenol 2,4,6[C]	88-06-2	3.2	1.4	2.4	---	970
Trichlorophenoxypropionic acid (2,4,5-tp) (Silvex)	93-72-1	50[M]	---	---	---	---
Total Trihalomethanes (HMs)	(total)[7]	80	80			
Trimethylbenzene 1,3,5	108-67-8	67	---	---	---	---
Vinyl Chloride[C, 12]	75-01-4	0.023 to 2[M]	0.023	2.3	---	---
Xylenes (total)[12]	1330-20-7	1,400 to 10,000[M]	---	---	---	---

2 Only applicable to segments classified for water supply.

Colorado Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

CODE OF COLORADO REGULATIONS ***5 CCR 1002-31***
Water Quality Control Commission

BASIC STANDARDS FOR ORGANIC CHEMICALS

(in micrograms per liter)

(d) Domestic Water Supply

These surface waters are suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, filtration, and disinfection with chlorine or its equivalent) these waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto.

Total Trihalomethanes (HMs)	(total)[7]	80	80	---	---	---
Trimethylbenzene 1,2,3	526-73-8	67	---	---	---	---
Trimethylbenzene 1,2,4	95-63-6	67	---	---	---	---
Trimethylbenzene 1,3,5	108-67-8	67	---	---	---	---
Vinyl Chloride[C, 12]	75-01-4	0.023 to 2[M]	0.023	2.3	---	---
Xylenes (total)[12]	1330-20-7	1,400 to 10,000[M]	---	---	---	---

Colorado Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

CODE OF COLORADO REGULATIONS
Water Quality Control Commission

5 CCR 1002-31

BASIC STANDARDS FOR ORGANIC CHEMICALS

(in micrograms per liter)

Parameter		Human Health Based[1]			Aquatic Life Based[4]	
	CAS No.	Water Supply[2]	Water+Fish[3]	Fish Ingestion[8]	Acute	Chronic
Trichloroethane 1,1,2 (1,1,2-TCA)[11, 12]	79-00-5	2.8 to 5[M]	2.7	71	9,400	---
Trichloroethylene (TCE)[C]						
Trichloropropane 1,2,3[C, 13]						
Trichlorophenol 2,4,5						
Trichlorophenol 2,4,6[C]						
Trichlorophenoxypropionic acid (Silvex)						
Total Trihalomethanes (HMs)						
Trimethylbenzene 1,2,3						
Trimethylbenzene 1,2,4						
Trimethylbenzene 1,3,5						
Vinyl Chloride[C, 12]						
Xylenes (total)[12]						

11 The Water+Fish and Fish Ingestions standards for these compounds have been calculated using a relative source contribution (RSC).

12 Whenever a range of standards is listed and referenced to this footnote, the first number in the range is a strictly health-based value, based on the Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. Control requirements, such as discharge permit effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end-of-pipe" discharge level more restrictive than the second number in the range. Water bodies will be considered in attainment of this standard, and not included on the Section 303(d) List, so long as the existing ambient quality does not exceed the second number in the range.

13 Mutagenic compound, age dependent factors were used in calculating standard.

C Carcinogens classified by the EPA as A, B1, or B2.

M Drinking water MCL.

Use MCL

- Permitting
- 303(d) Listing

Colorado Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

CODE OF COLORADO REGULATIONS ***5 CCR 1002-31***
Water Quality Control Commission

BASIC STANDARDS FOR ORGANIC CHEMICALS

(in micrograms per liter)

Parameter		Human Health Based[1]			Aquatic Life Based[4]	
	CAS No.	Water Supply[2]	Water+Fish[3]	Fish Ingestion[8]	Acute	Chronic
Trichloroethane 1,1,2 (1,1,2-TCA)[11, 12]	79-00-5	2.8 to 5[M]	2.7	71	9,400	---
Trichloroethylene (TCE)[C]	79-01-6	5[M]	2.5	30	45,000	21,900
Trichloropropane 1,2,3[C, 13]	96-18-4	3.7E-4	---	---	---	---
Trichlorophenol 2,4,5	95-95-4	700	700	3,600	---	---
Trichlorophenol 2,4,6[C]	88-06-2	3.2	1.4	2.4	---	970
Trichlorophenoxypropionic acid (2,4,5-tp)	93-72-1	50[M]	---	---	---	---

3 Applicable to all Class 1 aquatic life segments which also have a water supply classification or Class 2 aquatic life segments which also have a water supply classification designated by the Commission after rulemaking hearing. These class 2 segments will generally be those where fish of a catchable size and which are normally consumed are present, and where there is evidence that fishing takes place on a recurring basis. The Commission may also consider additional evidence that may be relevant to a determination whether the conditions applicable to a particular segment are similar enough to the assumptions underlying the water plus fish ingestion criteria to warrant the adoption of water plus fish ingestion standards for the segment in question.

Xylenes (total)[12]	1330-20-7	1,400 to 10,000[M]	---	---	---	---

Colorado Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

CODE OF COLORADO REGULATIONS
Water Quality Control Commission

5 CCR 1002-31

BASIC STANDARDS FOR ORGANIC CHEMICALS

(in micrograms per liter)

Parameter		Human Health Based[1]			Aquatic Life Based[4]	
	CAS No.	Water Supply[2]	Water+Fish[3]	Fish Ingestion[8]	Acute	Chronic
Trichloroethane 1,1,2 (1,1,2-TCA)[11, 12]	79-00-5	2.8 to 5[M]	2.7	71	9,400	---
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Trichloropropane 1,2,3[C, 13]	96-18-4	3.7E-4	---	---	---	---
Trichlorophenol 2,4,5	95-95-4	700	700	3,600	---	---
Trichlorophenol 2,4,6[C]	88-06-2	3.2	1.4	2.4	---	970
Trimethylbenzene 1,3,5	108-67-8	67	---	---	---	---
Vinyl Chloride[C, 12]	75-01-4	0.023 to 2[M]	0.023	2.3	---	---
Xylenes (total)[12]	1330-20-7	1,400 to 10,000[M]	---	---	---	---

8 Applicable to the following segments which do not have a water supply classification: all Class 1 aquatic life segments or Class 2 aquatic life segments designated by the Commission after rulemaking hearing. These class 2 segments will generally be those where fish of a catchable size and which are normally consumed are present, and where there is evidence that fishing takes place on a recurring basis. The Commission may also consider additional evidence that may be relevant to a determination whether the conditions applicable to a particular segment are similar enough to the assumptions underlying the fish ingestion criteria to warrant the adoption of fish ingestion standards for the segment in question.

Examples from Other States

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

- Idaho
- Colorado
- Indiana
- New Mexico

Indiana Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER QUALITY STANDARDS

Substances		Outside of Mixing Zone		Point of Water Intake
		Aquatic Life (CAC) (4-Day Average)	Human Health (30-Day Average)	Human Health (30-Day Average)
Metals (µg/l)				
(Total recoverable)				
Antimony			45,000 (T)	146 (T)
Arsenic (III)	#	#	0.175 (C)	0.022 (C)
Barium				1,000 (D)
Beryllium			1.17 (C)	0.068 (C)
Cadmium	#	#		10 (D)
Chromium (III)	#	#	3,433,000 (T)	170,000 (T)
Chromium (VI)	#	#		50 (D)
Copper	#	#		
Lead	#	#		50 (D)
Mercury$	2.4	0.012	0.15 (T)	0.14 (T)
Nickel	#	#	100 (T)	13.4 (T)
Selenium	130*	35		10 (D)
Silver	#			50 (D)
Thallium			48 (T)	13 (T)
Zinc	#	#		
Organics (µg/l)				
Acrolein			780 (T)	320 (T)
Acrylonitrile			6.5 (C)	0.58 (C)
Aldrin$	1.5*		0.00079 (C)	0.00074 (C)
Benzene			400 (C)	6.6 (C)
Benzidine			0.0053 (C)	0.0012 (C)
Carbon Tetrachloride			69.4 (C)	4.0 (C)

Indiana Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Table 8-3

Surface Water Quality Criteria for Protection of Human Health[1]

CAS Number	Substances	Human Noncancer Criteria (HNC) Drinking (µg/l)	Human Noncancer Criteria (HNC) Nondrinking (µg/l)	Human Cancer Criteria (HCC) Drinking (µg/l)	Human Cancer Criteria (HCC) Nondrinking (µg/l)
	Metals (total recoverable)				
7439976	Mercury (including methylmercury)	0.0018	0.0018		
	Organics (total)				
71432	Benzene	19	510	12	310
57749	Chlordane	0.0014	0.0014	0.00025	0.00025
108907	Chlorobenzene	470	3,200		
50293	DDT	0.002	0.002	0.00015	0.00015
60571	Dieldrin	0.00041	0.00041	6.5×10^{-6}	6.5×10^{-6}
105679	2,4-dimethylphenol	450	8,700		

Applicable to all state waters in the Great Lakes System

(A) Industrial water supply.
(B) Agricultural use.
(C) Public water supply.
(D) Full body contact.
(E) Aquatic life.
(F) Limited use.

Indiana Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER QUALITY STANDARDS

Substances		Outside of Mixing Zone		Point of Water Intake
		Aquatic Life (CAC) (4-Day Average)	Human Health (30-Day Average)	Human Health (30-Day Average)
Metals (µg/l)				
(Total recoverable)				
Antimony			45,000 (T)	146 (T)
Arsenic (III)	#	#	0.175 (C)	0.022 (C)
Barium				1,000 (D)
Beryllium			1.17 (C)	0.068 (C)
Cadmium	#	#		10 (D)
Chromium (III)	#	#	3,433,000 (T)	170,000 (T)
Chromium (VI)	#	#		50 (D)
Copper	#	#		
Lead	#	#		50 (D)
Mercury$	2.4	0.012	0.15 (T)	0.14 (T)
Nickel	#	#	100 (T)	13.4 (T)
Selenium	130*	35		10 (D)
Silver	#			50 (D)
Thallium			48 (T)	13 (T)
Zinc	#	#		
Organics (µg/l)				
Acrolein			780 (T)	320 (T)
Acrylonitrile			6.5 (C)	0.58 (C)
Aldrin$	1.5*		0.00079 (C)	0.00074 (C)
Benzene			400 (C)	6.6 (C)
Benzidine			0.0053 (C)	0.0012 (C)
Carbon Tetrachloride			69.4 (C)	4.0 (C)

30-day Average

Indiana Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Table 8-3

Surface Water Quality Criteria for Protection of Human Health[1]

CAS Number	Substances	Human Noncancer Criteria (HNC) Drinking (µg/l)	Human Noncancer Criteria (HNC) Nondrinking (µg/l)	Human Cancer Criteria (HCC) Drinking (µg/l)	Human Cancer Criteria (HCC) Nondrinking (µg/l)
	Metals (total recoverable)				
7439976	Mercury (including methylmercury)	0.0018	0.0018		
	Organics (total)				
71432	Benzene	19	510	12	310
57749	Chlordane	0.0014	0.0014	0.00025	0.00025
105679	2,4-dimethylphenol	450	8,700		

The HNC and HCC are thirty (30) day average criteria.

Applicable to all state waters in the Great Lakes System

Indiana Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER QUALITY STANDARDS

Substances		Outside of Mixing Zone		Point of Water Intake
		Aquatic Life (CAC) (4-Day Average)	Human Health (30-Day Average)	Human Health (30-Day Average)
Metals (µg/l)				
(Total recoverable)				
Antimony			45,000 (T)	146 (T)
Arsenic (III)	#	#	0.175 (C)	0.022 (C)
Barium				1,000 (D)

(48) "Human cancer criterion" or "HCC" refers to a HCV for a pollutant that meets the minimum data requirements for Tier I specified in section 14 of this rule.

(49) "Human cancer value" or "HCV" means the maximum ambient water concentration of a substance at which a lifetime of exposure will represent a plausible upper-bound risk of contracting cancer of one (1) in one hundred thousand (100,000) using the exposure assumptions specified in section 14 of this rule from either:

(A) drinking the water, consuming fish from the water, and water-related recreational activities; or

(B) consuming fish from the water and water-related recreational activities.

(50) "Human noncancer criterion" or "HNC" refers to a HNV for a pollutant that meets the minimum data requirements for Tier I specified in section 14 of this rule.

(51) "Human noncancer value" or "HNV" means the maximum ambient water concentration of a substance at which adverse noncancer effects are not likely to occur in the human population from lifetime exposure using section 14 of this rule from either:

(A) drinking the water, consuming fish from the water, and water-related recreational activities; or

Indiana Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER QUALITY STANDARDS

Substances		Outside of Mixing Zone		Point of Water Intake
		Aquatic Life (CAC) (4-Day Average)	Human Health (30-Day Average)	Human Health (30-Day Average)
Metals (µg/l)				
(Total recoverable)				
Antimony			45,000 (T)	146 (T)
Arsenic (III)	#	#	0.175 (C)	0.022 (C)
Barium				1,000 (D)
Beryllium			1.17 (C)	0.068 (C)
Cadmium	#	#		10 (D)
Chromium (III)	#	#	3,433,000 (T)	170,000 (T)
Chromium (VI)	#	#		50 (D)
Copper	#	#		
Lead	#	#		50 (D)
Mercury$	2.4	0.012	0.15 (T)	0.14 (T)
Acrolein			780 (T)	320 (T)
Acrylonitrile			6.5 (C)	0.58 (C)
Aldrin$	1.5*		0.00079 (C)	0.00074 (C)
Benzene			400 (C)	6.6 (C)
Benzidine			0.0053 (C)	0.0012 (C)
Carbon Tetrachloride			69.4 (C)	4.0 (C)

T derived from threshold toxicity.

C derived from nonthreshold cancer risk.

D derived from drinking water standards, equal to or less than threshold toxicity.

Indiana Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

327 IAC 2-1-8.6 Determination of concentration providing an acceptable degree of protection to public health for cancer

Authority: IC 13-14-8; IC 13-18-3
Affected: IC 13-18-4

demonstrates an association between exposure to the chemical and a statistically or biologically significant increase in the incidence of malignant or benign tumors shall be considered a carcinogen. With respect to "suitable quality," the only type of carcinogenicity study which will be automatically excluded from consideration as sole evidence of the carcinogenic properties of a particular chemical will be studies in which the tested chemical was administered via an injection route of exposure and an increase in malignant or benign tumors was produced only at the site of injection. Not included in this category are studies in which an injection dosing was administered intratracheally or by gavage. The commissioner shall reevaluate the carcinogenic potential of substances when new data of suitable quality become available.

(1) A water concentration of the carcinogen shall be derived from human epidemiological data or from appropriate animal research data using the following formula:

$$C = \frac{D \times W_h}{WC + (F \times BCF)}$$

Where:

C	=	concentration of the carcinogen (mg/l)
D	=	dose derived in clause (A), (B), or (C) (mg/kg/day)
W_h	=	seventy (70) kilograms, weight of an average human
WC	=	daily water consumption (0.01 liters per day for surface water not protected for drinking water supply; 2.0 liters per day for surface waters protected for drinking water supply)
F	=	sixty-five ten-thousandths (0.0065) kilograms per day, daily fish consumption
BCF	=	bioconcentration factor in $\frac{mg/kg}{mg/l}$ as determined in section 8.7 of this rule

Examples from Other States

- Idaho
- Colorado
- Indiana
- New Mexico

New Mexico Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

J. Use-specific numeric criteria.

(1) Table of numeric criteria: The following table sets forth the numeric criteria applicable to existing, designated and attainable uses. For metals, criteria represent the total sample fraction unless otherwise specified in the table. Additional criteria that are not compatible with this table are found in Subsections A through I, K and L of this section.

Pollutant	CAS Number	DWS	Irr	LW	WH	Aquatic Life			Type
						Acute	Chronic	HH-OO	
Aluminum, dissolved	7429-90-5		5,000						
Aluminum, total recoverable	7429-90-5					a	a		
Antimony, dissolved	7440-36-0	6						640	P
Arsenic, dissolved	7440-38-2	10	100	200		340	150	9.0	C,P
Asbestos	1332-21-4	7,000,000 fibers/L							
Barium, dissolved	7440-39-3	2,000							
Beryllium, dissolved	7440-41-7	4							
Boron, dissolved	7440-42-8		750	5,000					
Cadmium, dissolved	7440-43-9	5	10	50		a	a		
Chlorine residual	7782-50-5				11	19	11		
Chromium III, dissolved	16065-83-1					a	a		
Chromium VI, dissolved	18540-29-9					16	11		
Chromium, dissolved	7440-47-3	100	100	1,000					
Cobalt, dissolved	7440-48-4		50	1,000					
Copper, dissolved	7440-50-8	1300	200	500		a	a		

DWS
- Drinking Water Supply

HH-OO
- Human Health
- Organism Only

Type
- P = Persistent
- C = Cancer Causing

New Mexico Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

J. Use-specific numeric criteria.

(1) Table of numeric criteria: The following table sets forth the numeric criteria applicable to existing, designated and attainable uses. For metals, criteria represent the total sample fraction unless otherwise specified in the table. Additional criteria that are not compatible with this table are found in Subsections A through I, K and L of this section.

Pollutant	CAS Number	DWS	Irr	LW	WH	Aquatic Life			Type
						Acute	Chronic	HH-OO	
Aluminum, dissolved	7429-90-5		5,000						
Aluminum, total recoverable	7429-90-5					a	a		
Antimony, dissolved	7440-36-0	6						640	P
Arsenic, dissolved	7440-38-2	10	100	200		340	150	9.0	C,P
Asbestos	1332-21-4	7,000,000 fibers/L							
Barium, dissolved	7440-39-3	2,000							
Be[illegible]	7440-41-7	4							
Bo[illegible]									
Ca[illegible]									
Ch[illegible]									
Chromium III, dissolved	16065-83-1					a	a		
Chromium VI, dissolved	18540-29-9					16	11		
Chromium, dissolved	7440-47-3	100	100	1,000					
Cobalt, dissolved	7440-48-4		50	1,000					
Copper, dissolved	7440-50-8	1300	200	500		a	a		

B. Domestic water supply: Surface waters of the state designated for use as domestic water supplies shall not contain substances in concentrations that create a lifetime cancer risk of more than one cancer per 100,000 exposed persons. Those criteria listed under domestic water supply in Subsection J of this section apply to this use.

New Mexico Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

J. Use-specific numeric criteria.

(1) Table of numeric criteria: The following table sets forth the numeric criteria applicable to existing, designated and attainable uses. For metals, criteria represent the total sample fraction unless otherwise specified in the table. Additional criteria that are not compatible with this table are found in Subsections A through I, K and L of this section.

Pollutant	CAS Number	DWS	Irr	LW	WH	Aquatic Life			Type
						Acute	Chronic	HH-OO	
Aluminum, dissolved	7429-90-5		5,000						
Aluminum, total recoverable	7429-90-5					a	a		
Antimony, dissolved	7440-36-0	6						640	P
Arsenic, dissolved	7440-38-2	10	100	200		340	150	9.0	C,P
Asbestos	1332-21-4	7,000,000 fibers/L							
Barium, dissolved	7440-39-3	2,000							
Beryll[illegible]									
Boron									
Cadm									
Chlori									
Chron									
Chron									
Chromium, dissolved	7440-47-3	100	100	1,000					
Cobalt, dissolved	7440-48-4		50	1,000					
Copper, dissolved	7440-50-8	1300	200	500		a	a		

(a) The human health-organism only criterion shall be the recommended human health criterion for "consumption of organisms only" published by the U.S. environmental protection agency pursuant to Section 304(a) of the federal Clean Water Act. In determining such criterion for a cancer-causing toxic pollutant, a cancer risk of 10^{-5} (one cancer per 100,000 exposed persons) shall be used.

New Mexico Human Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

20.6.4.12 COMPLIANCE WITH WATER QUALITY STANDARDS: The following provisions apply to determining compliance for enforcement purposes; they do not apply for purposes of determining attainment of uses. The department has developed assessment protocols for the purpose of determining attainment of uses that are available for review from the department's surface water quality bureau.

A. Compliance with acute water quality criteria shall be determined from the analytical results of a single grab sample. Acute criteria shall not be exceeded.

B. Compliance with chronic water quality criteria shall be determined from the arithmetic mean of the analytical results of samples collected using applicable protocols. Chronic criteria shall not be exceeded more than once every three years.

C. Compliance with water quality standards for total ammonia shall be determined by performing the biomonitoring procedures set out in Subsections D and E of 20.6.4.14 NMAC, or by attainment of applicable ammonia criteria set out in Subsections K, L and M of 20.6.4.900 NMAC.

D. Compliance with the human health-organism only criteria shall be determined from the analytical results of representative grab samples, as defined in the water quality management plan. Human health-organism only criteria shall not be exceeded.

E. The commission may establish a numeric water quality criterion at a concentration that is below the minimum quantification level. In such cases, the water quality standard is enforceable at the minimum quantification level.

F. For compliance with hardness-dependent numeric criteria, dissolved hardness (as mg $CaCO_3$/L) shall be determined from a sample taken at the same time that the sample for the contaminant is taken.

Summary of Other States' Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

- States have both drinking water and aquatic organism human consumption criteria
  - Consumption of drinking water and aquatic organisms criteria applies to waters designated for drinking water
  - Consumption of aquatic organism criteria is often applied to the aquatic life use rather than a separate consumption of aquatic organism use

Summary of Other States' Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

- States use various terms to describe designated uses
  - Drinking water, drinking water supply, public water supply
  - Human health organism only, fish consumption, fish ingestion

Summary of Other States' Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

- Some states use Safe Drinking Water Act maximum contaminant levels for their drinking water uses

- It is less common for states to use organoleptic criteria

Summary of Other States' Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

- States do typically specify the cancer risk factor used
  - Some use default of 1:1,000,000
  - Some use less stringent value of 1:100,000
- Some states specify how the criteria were derived
  - Establish methodologies, Consumption rates, formulas

Summary of Other States' Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

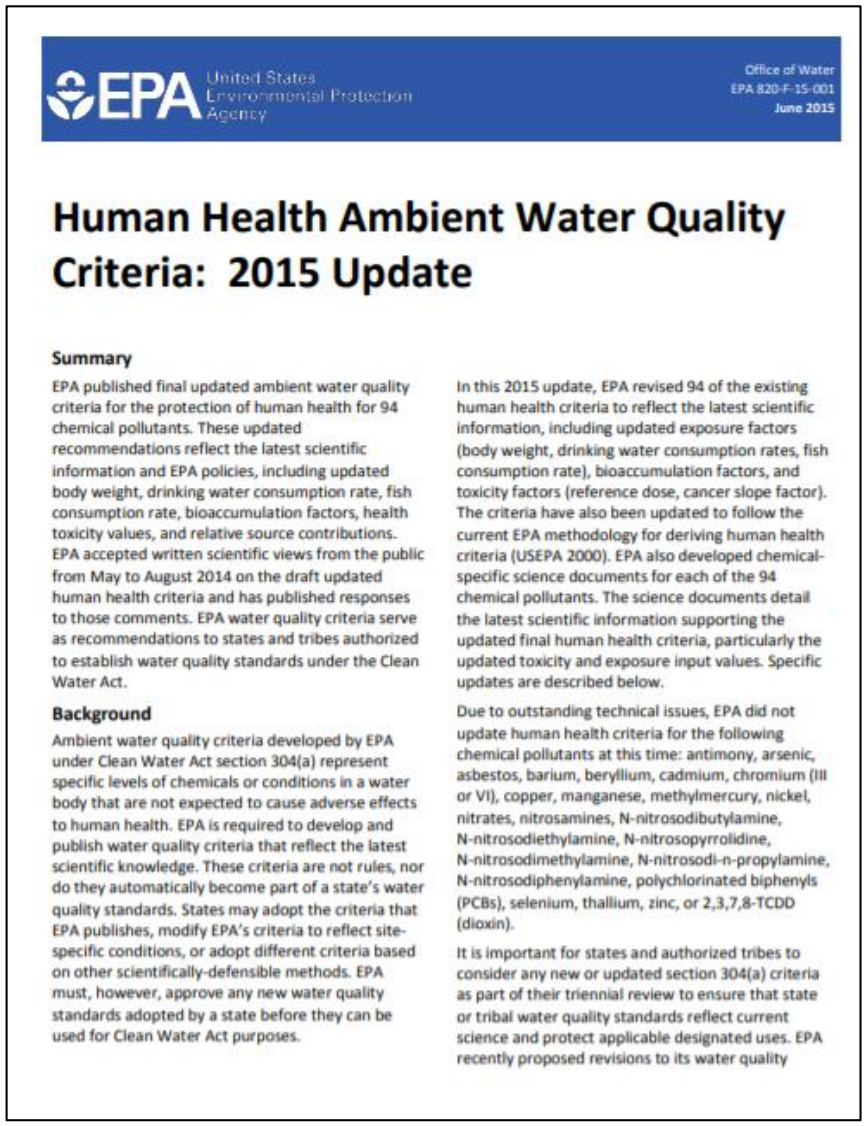
- Some states have established durations (e.g., 30 days, 1 year, etc.)
  - Many states have not established durations
- Most states use a not to exceed frequency

Status of 2015 Updated Recommendations

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Other States' Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY



EPA United States Environmental Protection Agency

Office of Water
EPA 820-F-15-001
June 2015

Human Health Ambient Water Quality Criteria: 2015 Update

Summary

EPA published final updated ambient water quality criteria for the protection of human health for 94 chemical pollutants. These updated recommendations reflect the latest scientific information and EPA policies, including updated body weight, drinking water consumption rate, fish consumption rate, bioaccumulation factors, health toxicity values, and relative source contributions. EPA accepted written scientific views from the public from May to August 2014 on the draft updated human health criteria and has published responses to those comments. EPA water quality criteria serve as recommendations to states and tribes authorized to establish water quality standards under the Clean Water Act.

Background

Ambient water quality criteria developed by EPA under Clean Water Act section 304(a) represent specific levels of chemicals or conditions in a water body that are not expected to cause adverse effects to human health. EPA is required to develop and publish water quality criteria that reflect the latest scientific knowledge. These criteria are not rules, nor do they automatically become part of a state's water quality standards. States may adopt the criteria that EPA publishes, modify EPA's criteria to reflect site-specific conditions, or adopt different criteria based on other scientifically-defensible methods. EPA must, however, approve any new water quality standards adopted by a state before they can be used for Clean Water Act purposes.

In this 2015 update, EPA revised 94 of the existing human health criteria to reflect the latest scientific information, including updated exposure factors (body weight, drinking water consumption rates, fish consumption rate), bioaccumulation factors, and toxicity factors (reference dose, cancer slope factor). The criteria have also been updated to follow the current EPA methodology for deriving human health criteria (USEPA 2000). EPA also developed chemical-specific science documents for each of the 94 chemical pollutants. The science documents detail the latest scientific information supporting the updated final human health criteria, particularly the updated toxicity and exposure input values. Specific updates are described below.

Due to outstanding technical issues, EPA did not update human health criteria for the following chemical pollutants at this time: antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium (III or VI), copper, manganese, methylmercury, nickel, nitrates, nitrosamines, N-nitrosodibutylamine, N-nitrosodiethylamine, N-nitrosopyrrolidine, N-nitrosodimethylamine, N-nitrosodi-n-propylamine, N-nitrosodiphenylamine, polychlorinated biphenyls (PCBs), selenium, thallium, zinc, or 2,3,7,8-TCDD (dioxin).

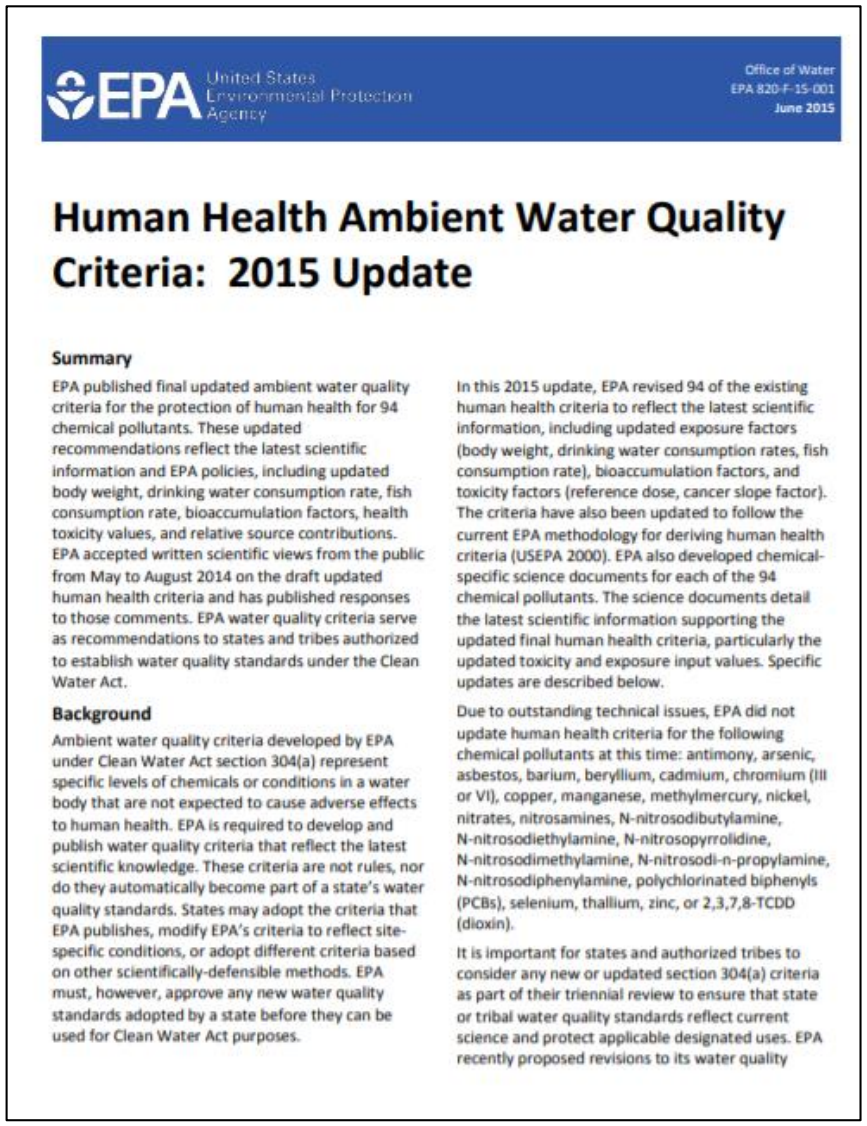
It is important for states and authorized tribes to consider any new or updated section 304(a) criteria as part of their triennial review to ensure that state or tribal water quality standards reflect current science and protect applicable designated uses. EPA recently proposed revisions to its water quality

2015 Updates for 94 Pollutants

- Adopted or Adopting All: Idaho, Pennsylvania, Utah, Virginia, Washington, Massachusetts, Maine
- Adopted or Adopting Some: Ohio, Montana, Maryland, Texas, North Dakota, Nebraska, Michigan

Other States' Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY



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It is important for states and authorized tribes to consider any new or updated section 304(a) criteria as part of their triennial review to ensure that state or tribal water quality standards reflect current science and protect applicable designated uses. EPA recently proposed revisions to its water quality

2015 Updates for 94 Pollutants

- Modifications
  - 1 in 100,000 cancer risk factor
  - Higher fish consumption rate
  - Old body weight, water intake, fish consumption
  - Only adopted more stringent values

Wyoming Water Quality Standards

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Ideas for Potential Changes to Standards

- Conceptual, Chapter 1 and Other Documents
- Potential Implications

Drinking Water and Fish Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Drinking Water and Fish Consumption Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Ideas for Potential Changes to Standards

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Section 3. Water Uses

Human Consumption of Aquatic Organisms: Surface water quality that supports or has the potential to support human consumption of aquatic organisms.

Drinking Water: Surface water quality that supports or has the potential to support human consumption of water after receiving conventional drinking water treatment (coagulation, flocculation, sedimentation, filtration, and disinfection with chlorine or its equivalent).

Chapter 1, Sediment and Turbidity Criteria

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Section X. Human Consumption of Drinking Water and Aquatic Organisms Criteria

Ideas for Potential Changes to Standards

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

- Consolidate all numeric criteria from Section 18, Section 22, and Appendix B
- Include Chemical Abstract Service Registry Number (CAS No.)
- Include duration of 30-days
- Include frequency: not to exceed in more than two separate years of a three year period

Ideas for Potential Changes to Standards

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

- 2015 Criteria
  - Adopt updates of 94 pollutants using EPA's 2015 recommendations
    - Use EPA recommended consumption rates for aquatic organisms and drinking water
    - Maintain 1 in 1,000,000 cancer risk factor for carcinogens

Potential Implications

Updating use descriptions, adding duration and frequency components, and adopting 2015 recommendations

- Improved clarity for designated uses and criteria to support designated uses
- Update Assessment Methods for determining attainment of uses potentially impaired due exceedances of consumption of drinking water and aquatic organisms
- Potential modifications to WYPDES permits for updated parameters where there is not more stringent aquatic life criteria

Chapter 1, Consumption of Drinking Water and Aquatic Organisms

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY