Water Quality Standards; Historical Policies Rulemaking
Technical Support Document

DRAFT DOCUMENT

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Executive Summary

The Department of Environmental Conservation (DEC) is proposing amendments at 18 AAC 70 to establish consistency between state water quality standards (WQS) and those WQS approved of by U.S. Environmental Protection Agency (EPA) for application in Clean Water Act (CWA) approved programs per 40 CFR 131.21. DEC is also proposing revisions to manganese criteria for the protection of human health to ensure WQS accurately reflect the risk of manganese toxicity from exposure when drinking untreated water and/or consuming aquatic organisms from surface waters. These actions are anticipated to have minimal effects upon state water pollution control programs.

What are Alaska's Surface Water Quality Standards?

States enact WQS to protect public health or welfare, enhance the quality of state waters, and serve the purposes of the CWA. Alaska's WQS are established in regulations at 18 AAC 70. WQS generally consist of :

- The water quality goals or specific uses (i.e., classes and sub-classes) that will be protected for state waters;
- The criteria, both numeric and narrative, that will be used to determine whether such uses are being attained;
- An antidegradation provision to ensure that existing water uses and the level of water quality necessary to protect existing uses are maintained and protected; and
- General provisions that affect their application and implementation in state water pollution control programs (e.g, mixing zones, water quality standards variances).

Under the CWA, *criteria* has two different definitions. Section 304(a) defines criteria as specific numeric concentrations recommended by EPA considered to be protective of aquatic life and human health. Section 303(c) defines *criteria* as the numeric (or narrative) targets considered to be protective of the water quality goals (i.e. classes and subclasses). A criterion is comprised of three components:

- Magnitude: Numeric or narrative value that represent the maximum allowable amount of a pollutant to be present in a waterbody while still considered to be protective of the associated use of that water.
- Duration: The time period used to calculate exposure (e.g., 1-hour or 96-hour average for toxic pollutants).
- Frequency: The allowable number of exceedances of the magnitude value that may occur within a specific time period. Frequency considers the amount to time required for a use to recover from the stress of exposure to a pollutant (e.g., no more than one exceedance every three years).

How are water quality standards revised?

WQS are revised periodically in accordance with state and federal administrative regulations. Revisions are made to incorporate new science, to meet new state or federal requirements, or to provide additidional clarity to the regulated public. Per section 303(c) of the CWA, WQS revisions

must be submitted to the EPA for review and approval prior to use in state water pollution control programs (e.g., APDES permits, waterbody assessments).

States must submit:

- State-adopted regulatory language;
- Methods used and analysis conducted to supports water quality standards revisions;
- Certification by state legal authority that the water quality standards were adopted pursuant to State law; and
- General information used to determine the adequacy of the scientific basis of the proposed standards and how the standard may be implemented in state water pollution control programs.

Technical Support Document Application

This technical support document (TSD) is intended to serve as a reference for those interested in understanding DEC's technical and legal decision making process and satisfy federal CWA requirements. It does not detail deliberations or specific implementation procedures that will be used by state water pollution control programs.

18 AAC 70.020. Protected Water Classes and Subclasses; Water Quality Criteria; Water Quality Standards Table

18 AAC 70.020(b) provides narrative and numeric criteria for each class and sub-class. DEC is proposing to amend narrative criteria at **18 AAC 70.020(b)(8) Residues, for Fresh Water Uses** and **18 AAC 70.020(b)(20) Residues, for Marine Water Uses**.

Background

DEC originally adopted narrative criteria for residues in 1979. In 2011 DEC adopted revised narrative criteria for residues in fresh and marine waters and submitted them to the EPA for review and approval per federal regulations at §131.21. EPA has not taken final action on DEC's adopted narrative criteria, therefore this language is not approved of for use in state water pollution control programs (e.g., Alaska Pollutant Discharge Elimination System permits, total maximum daily load calculations). This means that the 1979 criteria still in effect for CWA purposes differs from that adopted at 18 AAC 70.

Proposed Residue Amendments

In order to provide consistency between state and CWA-approved regulations, DEC withdrew the 2011 rulemaking from EPA review and proposes to re-adopt the 1979 narrative for fresh water and marine criteria previously approved of by EPA and currently in effect for CWA purposes at 18 AAC 70.020(b)(8) and 18 AAC 70.020(b)(20). This will ensure water quality standards are applied in a clear and consistent manner.

DEC has not identified recent scientific literature that would indicate re-adoption of the 1979 CWA-approved narrative criteria for residues would fail to protect designated uses. This action is anticipated to have minimal effects on existing APDES permittees, water quality assessments, and approved TMDLs.

18 AAC 70.240 Mixing Zones

18 AAC 70.240 provides narrative criteria for the conditions under which the department will authorize the use a mixing zone in which water quality criteria or limits may be exceeded.

Background

In 2019 EPA took final action on amendments to 18 AAC 70.240 adopted by DEC and submitted to EPA in 2006. EPA determined that the majority of language adopted by DEC was approved for use in CWA-approved programs. EPA also determined that language proposed at 18 AAC 70.240(g)(2), (3), and (4) pertaining to prohibitions to mixing zones were disapproved for use in CWA-approved programs. Inclusion of EPA-disapproved language at 18 AAC 70 creates confusion with the regulated public as to which WQS language is applicable for certain DEC actions. DEC is now proposing to repeal this language at 18 AAC 70.240(g)(2), (3), and (4).

18 AAC 70.240(g)(2), (3), and (4) provide that mixing zones may be authorized in spawning areas if the applicant submits an approved mitigation plan:

> (g) The department may authorize a mixing zone in a spawning area of a lake, stream, river, or other flowing fresh water for the species listed in (f) of this section if
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> (1) after consultation with the Department of Fish and Game, the department finds that the applicant has demonstrated that the discharge
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> (A) does not contain pollutants at concentrations that exceed the criteria for growth and propagation of fish, shellfish, other aquatic life, and wildlife established in 18 AAC 70.020(b)(1) - (12); and
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> (B) will not adversely affect the capability of the area to support future spawning, incubation, and rearing activities;
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> (2) the applicant has submitted to the department a mitigation plan approved by the Department of Fish and Game under 5 AAC 95.900 if the spawning area is within a special area;
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> (3) the applicant has submitted to the department a mitigation plan approved by the Department of Fish and Game under AS 16.05.871 – 16.05.901, if the spawning area is within waters included in the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes, adopted by reference in 5 AAC 95.011; the department will incorporate the mitigation plan as part of the discharge authorization; or
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> (4) the applicant has submitted to the department a mitigation plan approved by the department, after consultation with the Department of Fish and Game, if the spawning area is not within waters described in (2) or (3) of this subsection; the mitigation plan must use measures described in the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes, adopted by reference in 5 AAC 95.011; the department will incorporate the mitigation plan as part of the discharge authorization.

EPA determined that paragraphs (2), (3), and (4) were inconsistent with the CWA and 40 CFR Part 131 because such language could be used to authorize mixing zones that would impact spawning areas to such a degree that mitigation would be necessary to "restore" or "replace" the use – actions considered inconsistent with federal policies.

Proposed Mixing Zone Amendments

To resolve this perceived inconsistency, DEC will repeal language at 18 AAC 70.240(g)(2), (3), and (4). DEC has determined that the repeal of these paragraphs will have no effect on existing or pending actions authorized under 18 AAC 70.240.

Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (2008)

DEC is proposing two amendments to the Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (Toxics Manual)(2008) that is *adopted by reference* at 18 AAC 70.020(b)(11) and (22) for manganese and mercury. The proposed amendments are considered to be reflective of current science and risk assessment policies.

Manganese Numeric Criteria for the Protection of Human Health

Consumption of Water and Aquatic Organisms

The Toxics Manual (2008) applies a freshwater manganese (Mn) human health criterion (HHC) of 0.050 mg/L for the designated uses of consumption of drinking water and aquatic organisms for drinking, culinary, and food processing and the growth and propagation of fish, shellfish, other aquatic life and wildlife. This HHC is based on EPA's 1976 *Quality Criteria for Water* (referred to as the "Red Book"), which established 0.05 mg/L as the recommended water quality criterion for manganese for protection of domestic water supplies. This criterion was established to protect against objectionable tastes and laundry staining.

DEC has reviewed more recent scientific literature and determined that revising the existing criterion to more accurately reflect potential impacts on human health from consumption of untreated surface water and aquatic organisms is warranted. DEC has developed a manganese-specific technical support document (2021) that provides DEC's rationale for amending this HHC.

Consumption of Aquatic Organisms

The Toxics Manual (2008) applies a HHC of 0.10 mg/L manganese for consumption of aquatic organisms only to protect the designated use of growth and propagation of fish, shellfish, other aquatic life and wildlife. This HHC is based on EPA's *Quality Criteria for Water* (USEPA 1976) recommendation that a criterion of 0.10 mg/L is appropriate to protect marine organisms from bioconcentrating an amount of manganese that could adversely affect humans who eat marine organisms.

DEC has reviewed more recent scientific literature and determined that revisions to the adopted manganese human health criteria (HHC) is warranted. DEC has developed a manganese-specific technical support document (2021) that provides DEC's rationale.

Mercury Numeric Criteria for the Protection of Aquatic Life (Fresh Water)

Background

In 1992 EPA promulgated water quality criteria for mercury for the protection of aquatic life (fresh water) for Alaska as part of the National Toxics Rule (NTR). In a December 19, 1996 letter to Office of Water, EPA Region 10, DEC clarified that Alaska had previously adopted EPA-recommended (1986) acute and chronic aquatic life criteria for toxic pollutants (inc. Hg) *by reference*

and were in effect for CWA purposes in Alaska. EPA Region 10 approved the 1987 changes to the Alaska water quality standards, including adoption of toxic criteria by reference by letter dated April 6, 1987. As a result, EPA withdrew the NTR-promulgated criteria for Hg for Alaska in 1997.[1][2]

In 2003 DEC proposed amendments to the Toxics Manual to adopt Hg criteria for the protection of freshwater aquatic life (1.4 μg/L acute and 0.77 μg/L chronic.) based on EPA-recommended 1995 ambient water criteria. EPA responded in 2004[3] with the following statements:

> EPA is taking no action at this time on the acute and chronic freshwater aquatic life criteria for … and mercury because we need more time to complete the essential fish habitat consultation…and work with our EPA headquarters office.
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> The new aquatic life criteria for mercury…will not be in effect for CWA purposes until a decision is made by EPA about whether they can be approved. In the interim, the previously approved aquatic life crtieria for mercury 2.4 ug/l acute and 0.012 ug/l chronic, both as total recoverable)…will remain the applicable CWA standards and will be retained in the CWA WQS docket until EPA acts on this revision (65 FR 24643).

As of 2021 EPA has yet to complete the essential fish habitat consultation and take final action on DEC's proposed rulemaking per §131.21. In order to provide consistency between state and CWA-approved regulations, DEC withdrew the 2003 rulemaking from EPA review and proposes to re-adopt the acute criterion of 2.4 μg/L and a chronic criterion of 0.012 μg/L, both expressed as total recoverable. These criteria have previously been approved of by EPA and currently are in effect for use in CWA-approved programs.

[1] U.S. Environmental Protection Agency. 1997. Ltr to Michelle Brown. Review and Approval of Water Quality Standards Adopted in 1994 and 1996. U.S. Environmental Protection Agency Region 10.
[2] 62 FR 53212
[3] Randall F. Smith. 2004. EPA Review of the 2003 Revisions to the Alaska Water Quality Standards Regulations. U.S. Environmental Protection Agency. Region 10. Seattle, Washington

References

Alaska Department of Environmental Conservation. 2008. Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances. Juneau Alaska.