ARC 5226C

ENVIRONMENTAL PROTECTION COMMISSION[567]

Adopted and Filed

Rule making related to aquatic life water quality criteria

The Environmental Protection Commission (Commission) hereby amends Chapter 61, "Water Quality Standards," Iowa Administrative Code.

Legal Authority for Rule Making

This rule making is adopted under the authority provided in Iowa Code section 455B.173(2).

State or Federal Law Implemented

This rule making implements, in whole or in part, Iowa Code section 455B.173(2).

Purpose and Summary

The purpose of these amendments is to update the current aquatic life water quality criteria with the latest scientific information on metal toxicity. Research has established dissolved metals (except for aluminum) more closely approximate the bioavailable fraction of metals in the water column rather than total recoverable metals (the current criteria). This new data indicates that the dissolved portion of metals in the water column is the portion that is most easily absorbed by aquatic life and is therefore a better measure of toxicity. Thus, measuring for total recoverable metals, in light of the new data, is an overly stringent approach. Because of this research, the Commission is converting the aquatic life water quality criteria from total recoverable metals to dissolved metals based on available conversion factors for the following metals: arsenic (III), cadmium, chromium (VI), lead, mercury, nickel, silver, and zinc. In addition, the aquatic life criteria for cadmium will be recalculated from the U.S. Environmental Protection Agency (EPA)-published 2016 national criteria for Iowa waters based on the resident aquatic species residing in Iowa waters.

Unlike other metals, some non-dissolved forms of aluminum can be toxic to aquatic life. As a result, the Commission is adopting aluminum aquatic life water quality criteria in the form of bioavailable concentration values, which include both dissolved and some non-dissolved (colloidal) aluminum which can be toxic to aquatic life. The aluminum criteria also take into account new data which establish that aluminum bioavailability is dependent upon ambient levels of certain chemical parameters in the receiving stream, like pH, dissolved organic carbon, and hardness. These criteria were developed using the EPA's 2017 toxicity data and site-specific water chemistry data for Iowa waters. The criteria also provide wastewater permittees the option of collecting data specific to the permittee's own receiving stream. The Commission believes that the aluminum criteria will provide greater flexibility to wastewater permittees while still protecting aquatic life.

Public Comment and Changes to Rule Making

Notice of Intended Action for this rule making was published in the Iowa Administrative Bulletin on June 3, 2020, as **ARC 5044C**. A public hearing was held virtually on June 23, 2020, at 1 p.m. One oral comment was received during the virtual hearing. Six written comments were received during the public comment period. Comments were received from Arconic, Iowa Association of Business and Industry (ABI), the Aluminum Association, and ISG. Comments from Arconic, ABI, and the Aluminum Association were supportive of the rule making and requested clarification and greater specificity related to footnote (r) in Item 3. The comment from ISG requested clarification on implementation of dissolved metals criteria in National Pollutant Discharge Elimination System permits.

Three changes from the Notice were made in response to these comments. First, footnote (o) in Item 3 has been updated to ensure site-specific aluminum criteria may be calculated by including a sentence about the calculation of site-specific criteria.

Second, footnote (r) in Item 3 has been updated to better differentiate aluminum criteria as bioavailable, which is different than criteria that are expressed as "dissolved." Footnote (r) in Item 3 now references the bioavailable "portion" of aluminum, rather than the bioavailable "fraction" of aluminum. This avoids confusion caused by the word "fraction," which could have other scientific meanings related to water quality criteria than what is intended in this rule making.

The third change ensures uniformity between this final rule and the rule-referenced Iowa Wasteload Allocation Procedure (WLAP). The WLAP sets out on page 77 that "Iowa's numerical chemical criteria are expressed in total recoverable concentrations," which is inconsistent with this final rule. This has been corrected by deleting that sentence. The WLAP now has a new effective date of November 11, 2020, in Item 4, which has been added as a change from the Notice.

Adoption of Rule Making

This rule making was adopted by the Commission on September 15, 2020.

Fiscal Impact

This rule making has no fiscal impact to the State of Iowa but will have a positive fiscal impact on the private sector. Thirty facilities are currently subject to the existing aluminum criteria. Of these 30 facilities, 7 facilities have had aluminum permit limit violations, currently have a compliance schedule for aluminum, or will have a compliance schedule in their upcoming wastewater permit, and have enough data for evaluation. The Commission estimates that three of those seven facilities will be able to comply with the proposed aluminum criteria and will therefore be able to avoid the cost of installing aluminum removal technology. The Commission estimates this savings to be $42,503,000.

Currently, 81 facilities are subject to the rest of the metals criteria (arsenic (III), cadmium, chromium (VI), lead, mercury, nickel, silver, and zinc). The Commission estimates that 13 facilities will be able to comply with the dissolved metal criteria in this rule making and will therefore be able to avoid the cost of installing metals removal technology. The Commission estimates the savings to be between $42,746,700 and $52,763,000.

Therefore, the Commission estimates a total of 16 facilities may receive projected cost savings ranging from approximately $85 million to $95 million.

A copy of the fiscal impact statement is available from the Department upon request.

Jobs Impact

After analysis and review of this rule making, these amendments are expected to have a positive impact on jobs. Overall, this rule change will result in a savings ranging from $85 million to $95 million for wastewater dischargers across the state. This savings will be achieved by dischargers who will be able to avoid the installation of costly treatment technology because of their ability to protect aquatic life in a more reasonable manner.

The potential costs associated with this rule making are negligible. The savings resulting from this rule making will have a positive impact on private sector jobs and employment opportunities in the state. Lower wastewater treatment costs at industrial facilities are expected to have a positive impact on jobs because industries can put the savings toward investment in their businesses, including new hiring. Similarly, businesses and industries that discharge to municipal wastewater treatment plants will benefit from lower utility rates if the municipal wastewater treatment plant can lower its operating costs as a result of this rule making. That savings on utility rates for businesses and industries can be put toward investment in their companies to create jobs.

A copy of the jobs impact statement is available from the Department upon request.

Waivers

Any person who believes that the application of the discretionary provisions of this rule making would result in hardship or injustice to that person may petition the Department for a waiver of the discretionary provisions, if any, pursuant to 561—Chapter 10, as adopted by reference in rule 567—13.1(17A), to the extent such waiver is consistent with federal water quality standards requirements.

Review by Administrative Rules Review Committee

The Administrative Rules Review Committee, a bipartisan legislative committee which oversees rule making by executive branch agencies, may, on its own motion or on written request by any individual or group, review this rule making at its regular monthly meeting or at a special meeting. The Committee's meetings are open to the public, and interested persons may be heard as provided in Iowa Code section 17A.8(6).

Effective Date

This rule making will become effective on November 11, 2020.

The following rule-making actions are adopted:

ITEM 1. Amend subrule **61.3(3)**, TABLE 1, Criteria for Chemical Constituents, parameters for aluminum, arsenic (III), cadmium, chromium (VI), lead, mercury (II), nickel, silver, and zinc, as follows:

Aluminum	Chronic(r)	~~87~~ 890(o)	—	~~87~~ 890(o)	~~87~~ 890(o)	~~87~~ 890(o)	~~748~~ 890(o)	—	—
	Acute(r)	~~1106~~ 2,500(o)	—	~~750~~ 2,500(o)	~~750~~ 2,500(o)	~~750~~ 2,500(o)	~~983~~ 2,500(o)	—	—
Arsenic (III)	Chronic(p)	~~200~~ 150	—	150	150	150	~~200~~ 150	—	—
	Acute(p)	~~360~~ 340	—	340	340	340	~~360~~ 340	—	—
	Human Health — Fish	—	—	—	—	—	—	—	50(e)(g)
	Human Health — F & W	—	—	—	—	—	—	—	.18(f)(g)
Cadmium	Chronic(p)	~~1~~ 1.2(h)	—	~~.45~~ 1.2(h)	~~.45~~ 1.2(h)	~~.45~~ 1.2(h)	~~1~~ 1.2(h)	—	—
	Acute(p)	4 3.4(h)	—	~~4.32~~ 5.35(h)	~~4.32~~ 12.5(h)	~~4.32~~ 12.5(h)	4 5.35(h)	—	—
	Human Health + — Fish	—	—	—	—	—	—	—	168(e)
	MCL	—	—	—	—	—	—	5	—
Chromium (VI)	Chronic(p)	~~40~~ 11	—	11	11	11	~~10~~ 11	—	—
	Acute(p)	~~60~~ 16	—	16	16	16	~~15~~ 16	—	—
	Human Health + — Fish	—	—	—	—	—	—	—	3365(e)
	MCL	—	—	—	—	—	—	100	—
Lead	Chronic(p)	~~3~~ 5.3(j)	—	~~7.7~~ 5.3(j)	~~7.7~~ 5.3(j)	~~7.7~~ 5.3(j)	~~3~~ 5.3(j)	—	—
	Acute(p)	~~80~~ 136(j)	—	~~197~~ 136(j)	~~197~~ 136(j)	~~197~~ 136(j)	~~80~~ 136(j)	—	—
	MCL	—	—	—	—	—	—	50	—
Mercury (II)	Chronic(p)	~~3.5~~ 0.77	—	~~.9~~ 0.77	~~.9~~ 0.77	~~.9~~ 0.77	~~.91~~ 0.77	—	—
	Acute(p)	~~6.5~~ 1.4	—	~~1.64~~ 1.4	~~1.64~~ 1.4	~~1.64~~ 1.4	~~1.7~~ 1.4	—	—
	Human Health + — Fish	—	—	—	—	—	—	—	.15(e)
	Human Health + — F & W	—	—	—	—	—	—	—	.05(f)

Nickel	Chronic(p)	~~350~~ 93(k)	—	93(k)	93(k)	93(k)	~~150~~ 93(k)	—	—
	Acute(p)	~~3250~~ 840(k)	—	~~843~~ 840(k)	~~843~~ 840(k)	~~843~~ 840(k)	~~1400~~ 840(k)	—	—
	Human Health + — Fish	—	—	—	—	—	—	—	4600(e)
	Human Health + — F & W	—	—	—	—	—	—	—	610(f)
Silver	Chronic(p)	N/A	—	N/A	N/A	N/A	N/A	—	—
	Acute(p)	~~30~~ 11	—	~~3.8~~ 11	~~3.8~~ 11	~~3.8~~ 11	4 11	—	—
	MCL	—	—	—	—	—	—	50	—
Zinc	Chronic(p)	~~200~~ 210(l)	—	~~215~~ 210(l)	~~215~~ 210(l)	~~215~~ 210(l)	~~100~~ 210(l)	—	—
	Acute(p)	~~220~~ 210(l)	—	~~215~~ 210(l)	~~215~~ 210(l)	~~215~~ 210(l)	~~110~~ 210(l)	—	—
	Human Health + — Fish	—	—	—	—	—	—	—	26*(e)
	Human Health + — F & W	—	—	—	—	—	—	—	7.4*(f)

ITEM 2. Amend subrule **61.3(3)**, TABLE 1, footnotes (h), (j), (k), and (l), as follows:

(h) ~~Class B(WW-1), B(WW-2), and B(WW-3)~~ The acute and chronic criteria listed in main table are based on a hardness of 200 mg/l (as $CaCO_3$ (mg/l)). Numerical criteria (µg/l) for cadmium are a function of hardness (as $CaCO_3$ (mg/l)) using the ~~equation for each use according to the~~ following ~~table~~ equations:

	~~B(WW-1)~~ B(CW1)	~~B(WW-2)~~ B(WW-1)&B(LW)	~~B(WW-3)~~ B(WW-2)&B(WW-3)
Acute	$e^{[1.0166Ln(Hardness) - 3.924]}$ $\frac{(1.136672 - [(\ln hardness) \times (0.041838)])^*}{e^{(0.9789 \times \ln(hardness) - 3.866)}}$	$e^{[1.0166Ln(Hardness) - 3.924]}$ $\frac{(1.136672 - [(\ln hardness) \times (0.041838)])^*}{e^{(0.9789 \times \ln(hardness) - 3.4210)}}$	$e^{[1.0166Ln(Hardness) - 3.924]}$ $\frac{(1.136672 - [(\ln hardness) \times (0.041838)])^*}{e^{(0.9789 \times \ln(hardness) - 2.5750)}}$
Chronic	$e^{[0.7409Ln(Hardness) - 4.719]}$ $\frac{(1.101672 - [(\ln hardness) \times (0.041838)])^*}{e^{0.7977 \times \ln(hardness) - 3.909)}}$	$e^{[0.7409Ln(Hardness) - 4.719]}$ $\frac{(1.101672 - [(\ln hardness) \times (0.041838)])^*}{e^{0.7977 \times \ln(hardness) - 3.909)}}$	$e^{[0.7409Ln(Hardness) - 4.719]}$ $\frac{(1.101672 - [(\ln hardness) \times (0.041838)])^*}{e^{0.7977 \times \ln(hardness) - 3.909)}}$

(j) ~~Class B(WW-1), B(WW-2), and B(WW-3)~~ The acute and chronic criteria listed in main table are based on a hardness of 200 mg/l (as $CaCO_3$ (mg/l)). Numerical criteria (µg/l) for lead are a function of hardness ($CaCO_3$ (mg/l)) using the ~~equation for each use according to the~~ following ~~table~~ equations:

	~~B(WW-1)~~	~~B(WW-2)~~	~~B(WW-3)~~
Acute	$\frac{(1.46203-[(\ln hardness)(0.145712)]) \times}{e^{[1.2731Ln(Hardness) - 1.46]}}$	$e^{[1.2731Ln(Hardness) - 1.46]}$	$e^{[1.2731Ln(Hardness) - 1.46]}$
Chronic	$\frac{(1.46203-[(\ln hardness)(0.145712)]) \times}{e^{[1.2731Ln(Hardness) - 4.705]}}$	$e^{[1.2731Ln(Hardness) - 4.705]}$	$e^{[1.2731Ln(Hardness) - 4.705]}$

(k) ~~Class B(WW-1), B(WW-2), and B(WW-3)~~ The acute and chronic criteria listed in main table are based on a hardness of 200 mg/l (as $CaCO_3$ (mg/l)). Numerical criteria (µg/l) for nickel are a function of hardness ($CaCO_3$ (mg/l)) using the ~~equation for each use according to the~~ following ~~table~~ equations:

	~~B(WW-1)~~	~~B(WW-2)~~	~~B(WW-3)~~
Acute	$0.998 \times e^{[0.846Ln(Hardness) + 2.255]}$	$e^{[0.846Ln(Hardness) + 2.255]}$	$e^{[0.846Ln(Hardness) + 2.255]}$
Chronic	$0.997 \times e^{[0.846Ln(Hardness) + 0.0584]}$	$e^{[0.846Ln(Hardness) + 0.0584]}$	$e^{[0.846Ln(Hardness) + 0.0584]}$

(l) ~~Class B(WW-1), B(WW-2), and B(WW-3)~~ The acute and chronic criteria listed in main table are based on a hardness of 200 mg/l (as $CaCO_3$ (mg/l)). Numerical criteria (µg/l) for zinc are a function of hardness ($CaCO_3$ (mg/l)) using the ~~equation for each use according to the~~ following ~~table~~ equations:

	~~B(WW-1)~~	~~B(WW-2)~~	~~B(WW-3)~~
Acute	$0.978 \times e^{[0.8473Ln(Hardness) + 0.884]}$	$e^{[0.8473Ln(Hardness) + 0.884]}$	$e^{[0.8473Ln(Hardness) + 0.884]}$
Chronic	$0.986 \times e^{[0.8473Ln(Hardness) + 0.884]}$	$e^{[0.8473Ln(Hardness) + 0.884]}$	$e^{[0.8473Ln(Hardness) + 0.884]}$

ITEM 3. Adopt the following **new** footnotes (o), (p), (q), and (r) in subrule **61.3(3)**, TABLE 1, Criteria for Chemical Constituents:

(o) The acute and chronic criteria listed in Table 1 are calculated using Aluminum Criteria Calculator V2.0 (Excel) as described in "Final Aquatic Life Ambient Water Quality Criteria for Aluminum 2018 (EPA-822-R-18-001), December 2018." The criteria were calculated using the lowest tenth percentile of individual model outputs using spatially and temporally representative model inputs from across the state. Site-specific criteria shall also be developed using this approach and the most recent version of the calculator.

(p) The criteria are expressed as dissolved concentration.

(q) The silver criteria listed in Table 1 are based on a hardness of 200 mg/l (as $CaCO_3$ (mg/l)). Numerical criteria (µg/l) for silver are a function of hardness ($CaCO_3$ (mg/l)) using the following equation:
Acute $0.85\times e^{[1.72Ln(Hardness)-6.59]}$

(r) The criteria are expressed as the bioavailable portion of aluminum.

ITEM 4. Strike "as revised on February 21, 2018" wherever it appears in **567—Chapter 61** and insert "as revised on November 11, 2020" in lieu thereof.

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