UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

05 SEP 2019

Mr. Jim Macy, Director
Nebraska Department of Environment and Energy
1200 N Street, Suite 400
P.O. Box 98922
Lincoln, Nebraska 68509-8922

Dear Mr. Macy:

The U.S. Environmental Protection Agency has completed its review of the revisions to Nebraska's water quality standards under Nebraska's Code of State Regulations, Title 117 - Nebraska Surface Water Quality Standards, Chapters 1, 2, 4, 5, 6, 7, and 8. The Nebraska Department of Environment and Energy sent revisions to Nebraska's WQS to the EPA for review, as required under the Code of Federal Regulations at 40 CFR §131.20, on July 1, 2019; the EPA received this WQS package on July 8, 2019.

As part of the review process, the final draft revisions were made available for public review and comment starting February 28, 2019, and ending April 2, 2019. The availability of the revisions was announced in the public notice section of the Omaha World-Herald. The revisions were also made available through the Nebraska Department of Environmental Quality website.

The new or revised WQS were approved during the public hearing by the Nebraska Environmental Quality Council on April 3, 2019; the Office of the State Attorney General certified the revised WQS on June 24, 2019. The revisions were then approved by the Governor and filed with the Secretary of State on June 19, 2019; the WQS regulations became effective on June 24, 2019.

Under Section 303(c) of the Clean Water Act, 33 U.S.C. § 1313(c), states are to hold public hearings for the purpose of reviewing applicable WQS no less than once every three years, and to submit any revised or new standards to the EPA for review and approval. Federal regulations at 40 CFR §§ 131.20, 131.21, and 131.22 implement these requirements. Based on our review, Nebraska's public participation process is consistent with, and satisfies, the procedural requirements of 40 CFR § 131.20. It is especially noteworthy that Nebraska consistently conducts triennial reviews in a very timely manner.

Under Section 303(c) of the CWA, the EPA is required to review and approve or disapprove new or revised WQS adopted by the state. This review involves a determination of whether:

- The state has adopted designated uses consistent with the requirements of the CWA;
- The state has adopted criteria that protect the designated water uses;
- Whether the state has adopted an antidegradation policy that is consistent with 40 C.F.R. § 131.12, and whether any State adopted antidegradation implementation methods are consistent with § 131.12;

- Whether any state adopted WQS variance provision is consistent with 40 C.F.R. § 131.14;
- The state has followed its legal procedures for revising or adopting standards;
- The state standards that do not include the uses specified in Section 101(a)(2) of the CWA are based upon appropriate technical and scientific data and analyses;
- The state submission meets the requirements included in 40 C.F.R. § 131.6.

With this letter and enclosure, the EPA is approving the new or revised WQS submitted by the NDEE. The EPA is not acting on certain new or revised provisions included in the NDEE's submission that are not WQS; these are identified in Section II. The enclosure to this letter provides a more detailed description of the EPA's rationale for approving the new or revised WQS.

SECTION I - ITEMS THE EPA IS APPROVING

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   1. Changes to the definition of both Endangered and Threatened Species

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   1. 003.1C1 - Revised human health organism only criteria for 84 pollutants
   2. 004.01B – Revised human health water+organism criteria for 84 pollutants
   3. 003.01C3 - Adoption of the new CWA 304(a) recommendation for selenium
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D. Chapter 5 - Stream Classification by Basin
   1. Newly designated Public Drinking Water Supply uses for certain stream segments
   2. Removal of the seasonal Aquatic Life use designation for the Wood River, MP2-10200

E. Chapter 6 - Lakes and Impounded Water
   1. Clarification that livestock discharges are prohibited in lakes and reservoirs
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   1. 004.01C3 Adoption of the new CWA 304(a) recommendation for selenium

SECTION II - LIST OF NOTABLE NON-SUBSTANTIVE CHANGES

A. Housekeeping Changes

B. Nebraska Executive Order 17-04 addressing regulatory reform

C. Chapter 1 - Definition of Terms

D. Chapter 4 - Standards for Water Quality
   1. Correcting pollutant names

2. The deletion of 003.03B2 and 003.03C2 (identical), and 003.04B2 and 003.04C2 (identical) and combining those paragraphs into paragraphs 003.03B and 003.04B

E. Chapter 5 - Removal of maps

F. Chapter 6 - Renaming of one lake

The EPA's approval of revised aquatic life WQS is subject to the consultation requirement of Section 7(a)(2) of the Endangered Species Act. Under Section 7(a)(2) of the ESA, 16 U.S.C. §1536, the EPA has the obligation to ensure that its approval of these modifications to Nebraska's WQS regulation will not jeopardize the continued existence of threatened and endangered species and their critical habitat in Nebraska. The EPA initiated consultation with the U.S. Fish and Wildlife Service regarding the effects of EPA approving a change to Nebraska's WQS for selenium and cadmium aquatic life criteria on July 31, 2019.

The EPA's approval of revisions to the Nebraska's criteria pending completion of consultation under Section 7(a)(2) is fully consistent with Section 7(d) of the ESA because it does not foreclose either the formulation by the USFWS or the implementation by the EPA of any alternatives that might be determined in the consultation to be needed to comply with ESA Section 7(a)(2). Proceeding with a CWA section 303(c) approval action prior to the completion of the ESA Section 7 consultation provides a more protective condition for listed species and/or designated critical habitat during the interim period while the EPA is completing the ESA Section 7 consultation requirements on the WQS approval. Under CWA Section 303(c)(4)(B), the EPA has authority to take additional action regarding the revision of water quality standards for Nebraska if the consultation with the USFWS identifies deficiencies in the revised WQS requiring remedial action by the EPA, after the EPA has approved the revisions.

The EPA commends the state's commitment to protecting its waters by establishing WQS and adopting numeric criteria that significantly increase environmental protection to aquatic life and human health in waters in the state. We look forward to continuing to work with the NDEQ to update its water quality standards through the triennial review process. If you have any questions regarding this matter, please contact Amy Shields, Chief, Water Quality Management Branch, at (913) 551-7396. The staff contact regarding this letter is Ann Lavaty, and she may be reached at (913) 551-7370.

Sincerely,

9/5/19

Jeffery Robichaud
Director
Water Division

cc: Marty Link, NDEE
Corey Buffo, EPA HQ
Amanda Ciurej, USFWS Nebraska Field Office

ENCLOSURE

EPA REGION 7 REVIEW OF NEBRASKA'S 2019 TRIENNIAL REVIEW RULE REVISIONS TO NEBRASKA'S WATER QUALITY STANDARDS

Underlined language below represents new adoptions; ~~strike through~~ language represents deleted language.

SECTION I: ITEMS THE EPA IS APPROVING

A. Chapter 1-Definitions

Adopted revisions to Chapter 1 include the following changes to the definitions of both Endangered and Threatened Species:

> "Endangered Species" ~~shall mean, for the purpose of this Title, any aquatic species~~ are identified by the Nebraska Game and Parks Commission ~~whose continued existence as a viable component of the wild fauna of the State is determined to be in jeopardy or which meets the criteria of the Federal Endangered Species Act~~ in NAC Title 163, Chapter 4.
>
> "Threatened Species" ~~shall mean any aquatic species~~ are identified by the Nebraska Game and Parks Commission ~~whose continued existence as a viable component of the wild fauna of the State appears likely to become endangered or which meets the criteria of for threatened species in the Federal Endangered Species Act~~ in NAC Title 163, Chapter 4.

While these revisions delete reference to the Federal Endangered Species Act, NDEE has revised references to endangered and threatened species in Chapter 2 to include the word "and/or state" to clarify that both state and federally listed species are protected in the water quality standards. For instance, in Chapter 2, chronic mixing zones are prohibited from significantly impacting federally and/or state designated threatened or endangered aquatic species. The State list may include different species than the federal list. This is in keeping with NDEE's obligations under the Nebraska Nongame and Endangered Species Conservation Act (Neb. Rev. Stat. §37-807). The Nebraska Game and Parks Commission identified key species that are endangered and threatened under the Nebraska Nongame and Endangered Species Conservation Act (Neb. Rev. Stat. 37-807) and suggested additional species be included as sensitive species for water quality purposes. The NDEE has identified these key species by stream segment in Chapter 5 and has eliminated the duplicative list in Chapter 4, 003.01J1. Chapter 5 identifies both federally and state designated threatened or endangered species. It is EPA's understanding that NDEE will continue to protect both federally and state designated threatened or endangered species as key species in the State's WQS. This approach is consistent with the requirements of the CWA and EPA's implementing regulations at 40 C.F.R. 131.10.

B. Chapter 2. Application of Standards

1. Chapter 2, paragraph 015 - Variance authorizing provision

A Water Quality Standards (WQS) variance is a time-limited use and corresponding criterion targeted to a specific pollutant, pollutant source and/or waterbody and reflecting the highest attainable water quality condition during a specified time frame. The EPA encourages states and authorized tribes to utilize WQS variances, where appropriate, as an important WQ tool that provides time to make progress towards attaining the underlying designated use and criteria.

Under section 303(c) of the CWA, a WQS variance requires both a public hearing and the prior approval of the EPA. To obtain approval, a state must show that the designated use and criterion is not feasible throughout the term of the variance because of one of the factors listed 40 C.F.R. §131.14(b)(2)(i)(A).

A variance provides a state additional time to implement adaptive management approaches for improving water quality while retaining the designated use and criterion as a long-term goal. The EPA has recognized that a WQS variance can apply to individual dischargers, groups of dischargers, and entire water bodies or segments thereof. The EPA can approve a variance for a specific discharger or group of dischargers where the state satisfies the requirements in 40 C.F.R. §131.14.

The EPA has reviewed the following new and revised WQS and determined that they are consistent with the CWA requirements. 40 C.F.R. 131.13 provides that variance policies may be adopted at state discretion and that such general policies are subject to review and approval by the EPA. The following provides the basis for EPA approval of Nebraska's general authorizing provision for variances. Any variance adopted pursuant to this authorizing provision must be submitted to EPA and obtain EPA approval to be effective for CWA purposes.

Revisions include the following:

015 Variances.

015.01 Upon written application by any person and meeting the requirements of this section, the director may grant a variance for an interim beneficial use and interim criterion when it is determined that the attainment of a current beneficial use and criterion is not feasible because one of the following conditions is met:

015.01A One of the factors listed in 40 C.F.R 131.10(g) dated July 1, 2018, which is adopted and incorporated by reference, exists.

015.01B Actions necessary to facilitate lake, wetland, or stream restorations through dam removal or other significant reconfiguration activities preclude attainment of the designated use and criterion while the actions are being implemented.

015.02 Prior to the granting of any variance as allowed by 015.01, persons or categories of facilities eligible for an interim beneficial use and interim criterion will be proposed for adoption by the Nebraska Environmental Quality Council, after a public hearing

consistent with 40 C.F.R. 131.20(b) dated July 1, 2018, which is adopted and incorporated by reference. Categories of eligible facilities will be identified and proposed in conjunction with the next systematic review or subsequent triennial review.

015.03 Adoption and implementation of each variance will be in accordance with 40 C.F.R 131.14 dated July 1, 2018, which is adopted and incorporated by reference, except that 131.14(a)(2), 131.14(b)(1)(ii), and 131.14(b)(2)(i)(A) are to be replaced by paragraphs 015.04 through 015.06 of this regulation, respectively.

015.04 Each variance will have a designated term limit and reflect the highest attainable condition during the specified term. A variance may be applied to individual or multiple dischargers or surface water bodies.

015.05 Each variance will have requirements and a time limitation demonstrating the intent that progress be made toward the attainment of the underlying designated use and criterion.

015.05A Each Nebraska surface water quality standard not specifically addressed in a variance will remain applicable.

015.05B Each person requesting a variance is to provide evidence that a designated use and criterion, or a designated use or criterion addressed by the variance cannot be achieved solely by the implementation of technology-based effluent limits.

015.05C Each requirement of the variance is to represent the highest attainable condition of the surface water segment applicable throughout the term of the variance. A specified requirement will not result in lowering the currently attained ambient water quality, unless a variance is necessary for physical reconfiguration activities intended for surface water segment restoration. The highest attainable condition of each affected surface water segment as a quantifiable expression is to be specified as one of the following:

015.05C1 The highest attainable interim criterion;

015.05C2 The interim effluent condition that reflects the greatest pollutant reduction achievable; or

015.05C3 The interim criterion or effluent condition that reflects the greatest pollutant reduction achievable with the pollutant control technologies installed at the time the variance is adopted.

015.05D If the quantifiable expression identified in paragraph 015.05C3 is selected, a pollutant minimization plan consistent with 40 C.F.R 131.3(p) dated July 1, 2018, which is adopted and incorporated by reference, is to be adopted and implemented if no additional feasible pollutant control technology is identified.

015.06 Each variance request will include supporting documentation that demonstrates all of the following:

015.06A Attaining the designated use and criterion is not feasible throughout the term of the variance because of one of the factors cited in paragraphs 015.01A and 015.01B;

015.06B The term of the variance is only as long as necessary to achieve the highest attainable condition; and

015.06C The highest attainable condition of the affected surface water segment is as defined in paragraph 015.05C.

015.07 A discharger that adversely impacts water quality will not be granted a variance from requirements of Title 117, Chapter 3.

015.08 Specific eligibility requirements may be included in a multiple-discharger variance as an alternative to identifying the specific dischargers at the time of adoption of the variance. Each discharger is to meet the eligibility requirements in the applicable section of the "Nebraska Surface Water Quality Standards Variance Register", which will be made available to the public by the Department on its web site.

The variance authorizing provision included in paragraph 015 sets forth a procedure to be implemented when establishing a variance. The language included in paragraph 015 is consistent with CWA §303(c) and EPA 's implementing regulations at 40 C.F.R. §131.14 and is hereby approved by the EPA.

Consistent with 40 C.F.R. §131.14, the variance authorizing provision provides that NDEE, after adequate public notice, may authorize alternative WQS upon the demonstration that one of the factors listed in 40 C. F. R. § 131.l 0(g) exists and/or actions necessary to facilitate lake, wetlands, or stream restoration through dam removal or other significant reconfiguration activities preclude attainment of the designated use and criterion while the actions are being implemented.

Within the variance authorizing provisions, the NDEE incorporates by reference 40 C.F.R §131.3(p), dated July 1, 2018, the federal definition for a pollutant minimization plan, which reads:

> ***(p) Pollutant Minimization Program****, in the context of § 131.14, is a structured set of activities to improve processes and pollutant controls that will prevent and reduce pollutant loadings.*

Within the variance authorizing provisions, the NDEE also incorporates by reference 40 C.F.R. §131.14, dated July 1, 2018, with exception that 131.14(a)(2), 131.l4(b)(1)(ii), and 131. 14(b)(2)(i)(A) shall be replaced by paragraphs 015.04 through 015.06, respectively.

The EPA hereby approves the adoption of 40 C.F.R. §§131.3(p), 131.14, and paragraphs 015.04 through 015.06, and finds paragraphs 015.04 through 015.05 to be consistent with 40 C.F.R. §§§131.l4(a)(2), 131.14(b)(1)(ii), and l31.14(b)(2)(i)(A).

Paragraph 015.02 provides that "Categories of eligible facilities will be identified and proposed in conjunction with the next systematic review or subsequent triennial review." The EPA approves this language as an authorizing provision. The EPA finds providing for specific eligibility criteria as an alternative to identifying the specific discharger to be consistent with the EPA's Preamble to its 2015 promulgation of 40 C.F.R. §131.14. 80 FR 51019. Any variance adopted pursuant to this authorizing provision must be submitted to EPA and obtain EPA approval to be effective for CWA purposes.

C. Chapter 4. Standards for Water Quality

1. 003.01C1: Standards for Water Quality; Aquatic Life; Toxic Substances; Numerical criteria for the protection of Aquatic Life and Human Health designated uses.

In the June 24, 2019, revisions to the WQS, Nebraska adopted new and revised aquatic life and human health criteria values for 84 pollutants.

In revising its regulations at subrule 003.01C1, Nebraska adopted criteria as stringent as those published by the EPA pursuant to §304(a) of the CWA for the protection of aquatic life, and human health, through fish consumption and other aquatic organisms. The new and revised criteria are consistent with the EPA's 2015 updates to its national recommended water quality criteria under §304(a) of the CWA for human health to reflect the latest scientific information and EPA policies. The updates included updated fish consumption rate, body weight, drinking water intake, health toxicity values, bioaccumulation factors, and relative source contributions. For carcinogens, Nebraska specifically based most of these criteria on an acceptable incremental risk level of 1×10^{-5}; this risk management decision is included as a footnote to the Table in subrule 003.01C1 and was approved by the EPA in 1991.

When evaluating certain criteria values based on the EPA's 304(a) 2015 criteria updates, Nebraska chose to use the EPA's noncarcinogenic endpoints rather than criteria based on a 10^{-5} risk level because the noncarcinogenic endpoints are more conservative. This resulted in Nebraska adopting more conservative criteria values for the following seven pollutants: Methylene Chloride, Hexachloroethane, Tetrachloroethylene, Trichloroethylene, Hexachlorobutadiene, Benzene, and, 2,4,6-Trichlorophenol.

The basis for these revisions is to protect human health, the exposure pathway is through consumption of aquatic life. Both toxic effects and carcinogenic effects were considered.

The science supporting the EPA's 304(a) recommended criteria support the EPA's conclusion that Nebraska's criteria will be protective of aquatic life and human health. As such, Nebraska's revisions are consistent with 40 C.F.R. §§ 131.6(b), (c), and 131.11 (a) and (b)(i), and the EPA hereby approves these new and revised criteria.

Appendix A contains the underlined approved criteria values in paragraph 003.01C1 to represent the new/revised criteria to subrule 003.01C1; ~~strike-through~~ criteria values represent deletions to this subrule.

2. Chapter 4-004.01B: Standards for Water Quality; Water Supply; Public Drinking Water; Numerical Criteria

In the June 24, 2019, revisions to the WQS, Nebraska adopted new and revised public drinking water supply criteria values for 84 pollutants to protect human health.

In revising its regulations at subrule 004.01B, Nebraska adopted criteria as stringent as those published by the EPA pursuant to §304(a) of the CWA for the protection of human health, through consumption of water, fish and other aquatic organisms. The new and revised criteria are consistent with the EPA's 2015 updates to its national recommended water quality criteria under §304(a) of the CWA for human health to reflect the latest scientific information and EPA policies. The updates included updated fish consumption rate, body weight, drinking water intake, health toxicity values, bioaccumulation factors, and relative source contributions. For carcinogens, Nebraska specifically based most of these criteria on an acceptable incremental risk level of 1×10^{-5}; this risk management decision is included as a footnote to the Table in subrule 004.01B and was approved by the EPA in 1991.

When evaluating certain criteria values based on the EPA's 304(a) 2015 criteria updates, Nebraska chose to use the EPA's noncarcinogenic endpoints rather than criteria based on a 10^{-5} risk level because the noncarcinogenic endpoints are more conservative. This resulted in Nebraska adopting more conservative criteria values for the following six pollutants: Methylene Chloride, Hexachloroethane, Trichloroethylene, Hexachlorobutadiene, Benzene, and, 2,4,6-Trichlorophenol.

The basis for these revisions is to protect human health, the exposure pathway is through consumption of water, fish and other aquatic organisms. Both toxic effects and carcinogenic effects were considered.

The science supporting the EPA's 304(a) recommended criteria support the EPA's conclusion that Nebraska's criteria will be protective of aquatic life and human health. As such, Nebraska's revisions are consistent with 40 C.F.R. §§ 131.6(b), (c), and 131.11 (a) and (b)(i), and the EPA hereby approves these new and revised criteria.

Appendix B contains the <u>underlined</u> approved criteria values in paragraph 004.01B to represent the new/revised criteria to subrule 004.01B; ~~strike-through~~ criteria values represent deletions to this subrule.

3. 003.01C3 – Adoption of the new CWA §304(a) recommendations for Selenium

In the June 24, 2019, revisions to the WQS, Nebraska adopted new aquatic life criteria values for selenium. Previously, 003.01C1 contained criteria for dissolved selenium; the criteria for dissolved selenium has been removed from 003.01C1 and the state created the new paragraph 003.01C3 for the new selenium criteria. The new criteria are based on the EPA's new criteria recommendations for selenium for the protection of aquatic life. The criteria present a hierarchy whereby selenium values in fish tissue are more valid than water column values when both measurements are available. Because the criteria are to protect aquatic life from the toxic effects of selenium, this hierarchy places more importance on bioavailable selenium as opposed to inorganic forms in the water column.

The following paragraph contains the new selenium criteria:

> <u>003.01C3 The following Selenium criteria are for the protection of aquatic life. These criteria are expressed preferentially as fish tissue</u>

concentrations (mg/kg fish), followed by water column concentrations (mg/L) in the absence of fish tissue information.

POLLUTANT				CAS No.*
Selenium				7782-49-2
	FISH TISSUE[1] CRITERIA		WATER COLUMN[4] CRITERIA	
Criterion Element	Egg/Ovary[2]	Fish Whole Body or Muscle[3]	Thirty-day average	Intermittent Exposure[5]
Magnitude	15.1 mg/kg	8.5 mg/kg whole body or 11.3 mg/kg muscle	1.5 µg/L in lakes and reservoirs 3.1 µg/L in streams and rivers	WOCint = WQC30-day – Cbkgrnd(1-*f*int) *f*int
Duration	Instantaneous measurement[6]	Instantaneous measurement[6]	30 days	Number of days/month with an elevated concentration
Frequency	Not to be exceeded	Not to be exceeded	Not more than once in three years on average	Not more than once in three years on average

1. Fish tissue elements are expressed as steady-state.
2. Egg/Ovary supersedes any whole-body, muscle, or water column element when fish egg/ovary concentrations are measured.
3. Fish whole-body or muscle tissue supersedes water column element when both fish tissue and water column concentrations are measured.
4. Water column values are based on dissolved total selenium in water and are derived from fish tissue values via bioaccumulation modeling. Water column values are the applicable criterion element in the absence of steady-state condition fish tissue data.
5. Where WQC30-day is the water column monthly element, for either a lake or stream; Cbkgrnd is the average background selenium concentration, and *f*int is the fraction of any 30-day period during which elevated selenium concentrations occur, with *f*int assigned a value ≥0.033 (corresponding to 1 day).
6. Fish tissue data provide instantaneous point measurements that reflect integrative accumulation of selenium over time and space in fish populations at a given site.

* Chemical Abstract Services Registry Number

The science supporting the EPA's 304(a) recommended criteria for selenium support the EPA's conclusion that Nebraska's criteria will be protective of aquatic life. As such, Nebraska's revisions are consistent with 40 C.F.R. §§131.6(b), (c), and 131.11 (a) and (b)(i), and the EPA hereby approves these new and revised criteria.

4. 003.03B1 and 003.04B1 – Adoption of the new CWA §304(a) recommendations for Cadmium for cold water and warm water aquatic life uses

a. Cold water cadmium criteria

Nebraska's previous **cold water** acute and chronic criteria for cadmium were replaced in paragraph 003.03B1 with the EPA's new hardness-based equations for the protection of aquatic life. The adopted criteria are based on newer toxicity information and reflect current science. The adopted acute revision is slightly more stringent (1.8 µg/L vs. 2.0 µg/L at hardness of 100 mg/L). The adopted chronic revision is less stringent than the existing criteria (0.72 µg/L vs. 0.25 µg/L at hardness of 100 mg/L). Nebraska's new cold water criteria for cadmium are as follows:

Cadmium[2]	$(ACF)e^{(0.9789[\ln hardness]-3.866)}$ [a] $(CCF)e^{(0.7977[\ln hardness]-3.909)}$ [b]

[a] One-hour average concentration
[b] Four-day average concentration
[2] The conversion factors for cadmium are hardness dependent and defined by:
ACF = 1.136672-[ln *hardness* (0.041838)]
CCF = 1.101672-[ln *hardness* (0.041838)]

b. Warm water/wetland cadmium criteria

The previous **warm water** acute and chronic criteria for cadmium were replaced in paragraph 003.04B1 with the EPA's new hardness-based equations for the protection of aquatic life. The EPA's latest 304(a) cadmium criteria recommendations were recalculated by the NDEE to reflect warmwater/wetland species. The EPA's evaluation of the NDEE's recalculation of the warm water acute and chronic cadmium criteria indicate they will be protective of aquatic life in Nebraska.[1] The adopted recalculated criteria are based on newer toxicity information and reflect current science. The adopted acute revision is more stringent (2.8 µg/L vs. 5.9 µg/L at hardness of 100 mg/L). The adopted chronic revision is less stringent than the existing criteria (0.72 µg/L vs. 0.25 µg/L at hardness of 100 mg/L). Nebraska's new warm water cadmium criteria are as follows:

Cadmium[2]	$(ACF)e^{(0.9789[\ln hardness]-3.421)}$ [a] $(CCF)e^{(0.7977[\ln hardness]-3.909)}$ [b]

[a] One-hour average concentration
[b] Four-day average concentration
[2] The conversion factors for cadmium are hardness dependent and defined by:
ACF = 1.136672-[ln *hardness* (0.041838)]
CCF = 1.101672-[ln *hardness* (0.041838)]

Findings:
The science supporting the EPA's 304(a) recommended criteria for cadmium support the EPA's conclusion that Nebraska's cold water and warm water criteria will be protective of aquatic life. As such, Nebraska's revisions are consistent with 40 C.F.R. §§ 131.6(b), (c), and 131.11 (a) and (b)(i), and

[1] The EPA's Office of Water/Science and Technology, Health and Ecological Criteria Review of Nebraska's Proposed Recalculation of 2016 Cadmium Criteria for Warm Water Classification, August 30, 2017.

the EPA hereby approves these new and revised criteria.

D. Chapter 5. Stream Classification by Basin

1. Newly designated Public Drinking Water Supply uses for certain stream segments in the Nemaha River Basin

As a result of coordination between the Nebraska Department of Health and Human Services (DHHS) Drinking Water Division and NDEE Water Quality Division, certain stream segments were newly designated for the beneficial use of Public Drinking Water Supply. The City of Auburn's public drinking water system wells were designated by the DHHS as Groundwater Under the Direct Influence of Surface Water (GWUDI). This designation means that hydrologically-connected surface water from streams makes up a large portion of the total water pumped from these groundwater wells. When surface waters are used for public drinking water uses, they are designated under the Public Drinking Water Supply use classification in Title 117 so that they can be adequately protected for this beneficial use. Extensive modelling has demonstrated that the following streams near Auburn's well field, in the Nemaha Basin, affect the groundwater pumped:

NE3-10000 Little Nemaha River - North Fork Little Nemaha River to Missouri River
NE3-10900 Unnamed Creek (Sec 30-5N-15E)
NE3-11000 Hughes Creek
NE3-11100 Codington Creek
NE3-11200 Unnamed Creek (Sec 24-5N-14E)
NE3-11300 Unnamed Creek (Sec 23-5N-14E)
NE3-11400 Longs Creek - Scotch Branch to Little Nemaha River
NE3-11410 Scotch Branch
NE3-11500 Longs Creek - Headwaters to Scotch Branch
NE3-11600 Willow Creek

The EPA approves the addition of the Public Drinking Water Supply designated use for the ten streams identified above as consistent with §§303(c)(2) and 101(a) of the CWA and Federal implementing regulations at 40 C.F.R. §§131.6 and 131.10.

2. Removal of the seasonal aquatic life use designation for the Wood River in the Middle Platte Basin

Section 101(a)(2) of the federal Clean Water Act states that "wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved. This establishes a presumption that aquatic life and recreational beneficial uses are to be supported by all waters. Thus, unless shown through a use attainability analysis (UAA), waterbodies should be assigned aquatic life and recreational uses. No UAA has been performed to remove the aquatic life use seasonally on MP2-10200, Middle Platte Basin, part of the Wood River; therefore, the notation that the aquatic life use only applies seasonally was removed to comply with the Clean Water Act and 40 CRF Part 131.

The EPA approves the removal of the notation for the seasonal designation regarding its aquatic life designated use for the Wood River, Chapter 5, MP2-10200, as consistent with 40 C.F.R. §§131.6 and 131.10.

E. Chapter 6: Lakes and Impounded Waters

1. Chapter 6 – 004: Clarification that livestock discharges are prohibited in lakes and reservoirs

The following paragraph was revised to clarify that National Pollutant Discharge Elimination System point source discharges are prohibited to lakes or impounded waters and that this includes defined point source discharges from livestock operations.

> 004 No point source discharge of wastewater from domestic, municipal, ~~or~~ industrial, or livestock sources ~~shall~~ will be allowed directly into lakes or impounded waters except:...

40 C.F.R. §131.13 provides that States may, at their discretion, include in their State standards, policies generally affecting their application and implementation, such as mixing zones, low flows and variances. Such policies are subject to EPA review and approval. The EPA hereby approves the revised paragraph 044.

2. Chapter 6 – 005: Addition of 15 new lakes and reservoirs with CWA §101(a)(2) designated uses

Nebraska added 15 new lakes and reservoirs to Chapter 6 - 005 with newly assigned designated uses; these use designations include Recreation, Warmwater Class A Aquatic Life, Agricultural Class A Water Supply, and Aesthetics. The lake names, legal descriptions, Basin/segment numbers, and nutrient classification, in the table of Chapter 6-005 are as follows:

Lake Name	Legal Description	Basin-segment number	Nutrient Classification
Wilber Reservoir No. 1	Sec 21-6N-4E, Saline County	BB1-L0095	Eastern
Pressey Pond Wildlife Management Area	Sec 15-14N-21W, Custer County	LO4-L0045	Western
Yanney Park Lake (Kearney)	Sec 10-8N-16W, Buffalo County	MP2-L0335	Western
Pawnee Slough Lake (WMA)	Sec 21-13N-28W, Lincoln County	MP2-L0795	Western
Heartland Park Lake (Omaha)	Sec 23-15N-13E, Douglas County	MT1-L0063	Eastern
Lawrence Youngman Lake (Omaha)	Sec 18-15N-11E, Douglas County	MT1-L0067	Eastern

Flanagan Lake (Omaha)	Sec 33-16N-11E, Douglas County	MT1-L0095	Eastern
Buck Creek Lake Nemaha Natural Resources District	Sec 17-6N-15E, Nemaha County	NE1-L0003	Eastern
Duck Creek Lake Nemaha Natural Resources District	(Sec 12-6N-14E, Nemaha County	NE1-L0007	Eastern
Cozad Lake (South Pine WMA)	Sec 26-28N-21W, Brown County	NI3-L0063	Sandhills
Tower Lake (Yellowthroat WMA) U.S. Fish & Wildlife Service	Sec 25-28N-22W, Brown County	NI3-L0067	Sandhills
Lord Lake (Samuel R. McKelvie National Forest) U.S. Forest Service	Sec 10-31N-32W, Cherry County	NI3-L0335	Sandhills
South Morrill Sandpit - Village of Morrill	Sec 28-23N-57W, Scotts Bluff County	NP3-L0140	Western
Middle Morrill Sandpit - Village of Morrill	Sec 28-23N-57W, Scotts Bluff County	NP3-L0150	Western
North Morrill Sandpit - Village of Morrill	Sec 28-23N-57W, Scotts Bluff County	NP3-L0160	Western

Nebraska adopted, and the EPA approved in 2012, the three categories of Lakes and Impounded waters nutrient classification codes, Eastern, Western and Sandhills (E, W, SH), as shown in the table above; these were added to the table in Chapter 6-005 to correspond to the three classes adopted in Chapter 4, 003.05. The following numeric nutrient criteria apply to these classifications:

Lake or Impounded Waters	Classification Codes	Total Phosphorus (ug/l)	Total Nitrogen (ug/l)	Chlorophyll a (ug/l)
Eastern Lakes and Impounded Waters	E	50	1000	10
Western Lakes and Impounded Waters	W	40	800	8
Natural Sandhill Lakes	SH	---	---	---

The EPA approves the additions of these lakes and assigned designated uses as consistent with §§

303(c)(2) and 101(a) of the CWA and Federal implementing regulations at 40 C.F.R. §§131.6 and 131.10.

F. Chapter 7-004.01C1: Water Quality Standards for Wetlands; Aquatic Life;

1. 004.01C Toxic Substances; Numerical criteria for the protection of Aquatic Life and Human Health designated uses.

Nebraska revised paragraph 004.01C1 as follows:

> 004.01C1 ~~The following numerical criteria~~ Criteria for the protection of aquatic life and their uses are found in Title 117, Chapter 4, 003.01C1 with the exception of the following. These criteria ~~shall~~ are not to be exceeded. Unless otherwise noted, criteria are based on total concentrations.

As a result, the numeric aquatic life criteria previously identified in this chapter are now referenced to Chapter 4, 003.01C1 to avoid duplication within Title 117. All numeric criteria previously identified in this chapter were identical to those listed in Chapter 4. The revised paragraph makes an exception for the following pollutant criteria values: new warm water cadmium criteria, approved above in Section B.4, and the prior criteria for Chromium III, Chromium VI, and Cyanide which were retained. The criteria for Selenium reference the new paragraph 004.01C3 approved in Section B.3 above.

2. 004.01C3 Selenium Criteria

Nebraska adopted the EPA's new aquatic life criteria values for selenium to protect aquatic life in wetlands; the criteria are in the same form and have the same values as those approved above in Section B.3 of this document. As noted above in Section B.3, previously, 004.01C1 contained criteria for dissolved selenium; the criteria for dissolved selenium has been removed from 004.01C1 as the state created the new paragraph 004.01C3 for the new selenium criteria.

3. Waco Basin

Waco Basin (Sec 10-11N-1W, York County), (BB3-L0030) was removed from Chapter 6 because it was restored as a wetland and no longer has lake or impounded water characteristics. As a wetland, it is protected by Chapter 7, Water Quality Standards for Wetlands.

SECTION II: LIST OF NOTABLE NON-SUBSTANTIVE CHANGES

The following are non-substantive changes to Nebraska's regulations, they do not require Agency approval because they do not constitute new or revised WQS.

A. Housekeeping Changes

There were several housekeeping changes that involved updating waterbody names, correcting

cross-reference paragraph numbers, changing notation and naming of pollutants to accepted conventions (e.g. mg/l to mg/L), inserting missing underscores in paragraph numbers, moving and consolidating duplicative criteria sections for clarity, correcting typographical errors, and renumbering paragraphs due to insertions of new paragraphs or deletion of existing paragraphs.

B. Nebraska Executive Order 17-04 addressing regulatory reform

1. Replacement of words

The replacement of words such as "shall" was intended to make regulatory text more accessible to a wider audience of readers, reduce formal legal jargon, and simplify and modernize the NDEE's use of legal language in regulations. The adopted changes are not legally significant in terms of substantive meaning or enforceability by the NDEE.

2. Repeal of Chapter 8

In a shorter form, Chapter 8 restated the statutory requirement in § 84-906(1) of the Nebraska Administrative Procedure Act, relating to when a rule or regulation takes legal effect after its adoption. As this regulation merely restated a statutory requirement, it was repealed consistent with Nebraska Executive Order 17-04 addressing regulatory reform.

C. Chapter 1 – Definition of Terms

1. **Section 001.** This new paragraph refers the following terms to language in Neb Rev. Stat. §81-1502; "Department", "Garbage", "Junk", "Point Source", "Refuse", "Rubbish", and "Water Pollution." These individual definitions were removed from this Chapter. Subsequent paragraphs were renumbered as appropriate.

2. **Section 013 renumbered to 014**. The term "Clean Water Act" was clarified by referring to federal law codified at 33 U.S.C. §1251 et seq.

3. **Section 024.** The term "Endangered Species" was referred to language contained in NAC title 163, Chapter 4.

4. **Section 032.** The term "Human Induced Condition" was removed because it is self-explanatory.

5. **Section 034.** The term "Impounded Waters" was removed and its text is combined with "Lake or Impounded Water."

6. **Section 037 renumber 033.** The term "Lake or Impounded Water" was modified to add the language from the removed term "Impounded Waters."

7. **Section 043.** The term "No Observed Effect Level (NOEL)" was removed because it occurs only once in Title 117 (Ch. 2, 010.06C3, p. 2-5). The text of this definition was moved to the single occurrence of this term at Chapter 2, section 010.06C3.

8. **Section 074.** The term "Threatened Species" was referred to language contained in NAC title 163, Chapter 4.

D. Chapter 4 – Standards for Water Quality

1. Several pollutant names that were previously represented by abbreviations were corrected to refer to their proper names; many pollutant names were corrected to reflect proper naming conventions.

2. Deletion of 003.03B2 and 003.03C2 (identical), and 003.04B2 and 003.04C2 (identical) and combining those paragraphs into paragraphs 003.03B and 003.04B

E. Chapter 5 – Stream Classification by Basin

The maps located in Chapter 5 were removed. These maps were not legally significant in terms of substantive meaning or enforceability by the NDEE. They will be made available as a resource on the NDEE's web site.

F. Chapter 6 – Lakes and Impounded Waters

The name of Alliance City Lake (NI4-L0060) was changed to Laing Lake. The lake is owned by the City of Alliance.

Appendix A

New and revised numeric criteria for the protection of aquatic life and human health/fish consumption, and revised, proper, naming for many substances. Underlined criteria values represent the new/revised criteria; strike-through criteria values represent deletions.

003.01C1 The following numerical criteria for the protection of aquatic life and their uses (e.g., fish consumption) ~~shall~~ are not to be exceeded. Unless otherwise noted, criteria are based on total concentrations.

POLLUTANT	CRITERIA (µg/~~L~~ug/l) Acute	Chronic	CAS No.[*]
Pesticides:			
Acrolein	3[c]	3[d]	107-02-8
Alachlor	760[c]	76[d]	15972-60-8
Aldrin	3.0[a]	~~0.0005[b,e]~~0.0000077[b,e]	309-00-2
Atrazine	330[c]	12[d]	1912-24-9
~~BHC[k]~~ Hexachlorocyclohexane (HCH)-Technical	100[a]	~~0.414[b,e]~~0.1[b,e]	608-73-1
~~Alpha-BHC~~ alpha-Hexachlorocyclohexane (HCH)	(Reserved)	~~0.049[b,e]~~0.0039[b,e]	319-84-6
~~Beta-BHC~~ beta-Hexachlorocyclohexane (HCH)	(Reserved)	~~0.17[b,e]~~0.14[b,e]	319-85-7
Carbaryl	2.1[c]	2.1[d]	63-25-2
Chlordane	2.4[a]	~~0.0043[b]~~0.0032[b,e]	57-74-9
Chlorpyrifos	0.083[c]	0.041[d]	2921-88-2
DCPA[~~j~~1]	(Reserved)	14,300[d]	1861-32-1
p,p'-Dichlorodiphenyltrichloroethane or DDT[4]	1.1[a]	~~0.001[b]~~0.0003[b,e]	50-29-3
p,p'-Dichlorodiphenyldichloroethylene or DDT metabolite (DDE)	1050[a]	~~0.0022[b,e]~~0.00018[b,e]	72-55-9
p,p'-Dichlorodiphenyldichloroethane or DDT metabolite (TDE, DDD)	0.6[a]	~~0.0031[b,e]~~0.0012[b,e]	72-54-8
Demeton	(Reserved)	0.1[b]	8065-48-3
Diazinon	0.17[c]	0.17[d]	333-41-5
Dieldrin	0.24[a]	~~0.00054[b,e]~~0.000012[b,e]	60-57-1
Dioxin[~~2~~2]	< 0.01[a]	0.000000051[b,e]	1746-01-6
~~Alpha~~alpha-Endosulfan	0.22[a]	0.056[b]	959-98-8
~~Beta~~beta-Endosulfan	0.22[a]	0.056[b]	33213-65-9
Endosulfan sulfate	(Reserved)	~~89[b,f]~~40[b,f]	1031-07-8
Endrin	0.086[a]	~~0.036[b]~~0.03[b,f]	72-20-8
Endrin aldehyde	(Reserved)	~~0.29[b,f]~~1.0[b,f]	7421-93-4
Guthion	(Reserved)	0.01[b]	86-50-0
Heptachlor	0.52[a]	~~0.00079[b,e]~~0.000059[b,e]	76-44-8
Heptachlor epoxide	0.52[a]	~~0.00039[b,e]~~0.00032[b,e]	1024-57-3
Isophorone	117,000[a]	~~9,600[b,e]~~18,000[b,e]	78-59-1
gamma-Hexachlorocyclohexane (HCH) or Lindane[2]	0.95[a]	0.16[b]	58-89-9
Malathion	(Reserved)	0.1[b]	121-75-5
Methoxychlor	(Reserved)	~~0.03[b]~~0.02[b,f]	72-43-5

POLLUTANT	CRITERIA (µg/L~~ug/l~~) Acute	Chronic	CAS No.*
Metolachlor	390[c]	100[d]	51218-45-2
Metribuzin	(Reserved)	100[d]	21087-64-9
Mirex	(Reserved)	0.001[d]	2385-85-5
Parathion	0.065[c]	0.013[d]	56-38-2
Pentachlorophenol	$e^{(1.005(pH)-4.869)}$ [c]	~~$e^{(1.005(pH)-5.134)}$~~ [d] 0.4[b,e]	87-86-5
Propachlor	(Reserved)	8.0[d]	1918-16-7
Toxaphene	0.73[c]	0.0002[d]	8001-35-2
Tributyltin (TBT)	0.46[c]	0.072[d]	.....
Chlorphenoxy Herbicide (2,4-D)	Reserved	12,000[b,f]	94-75-7
Chlorphenoxy Herbicide (2,4,5-TP) [Silvex]	Reserved	400[b,f]	93-72-1
Metals and Inorganics[~~63~~]:			
Aluminum	750[c]	87[d]	7429-90-5
Antimony	88[c]	30[d]	7440-36-0
Arsenic	340[c]	16.7[b,e]	7440-38-2
Beryllium	130[a]	5.3[d]	7440-41-7
Cadmium	(See Site-Specific or Aquatic Life Use Class Criteria)		7440-43-9
Chromium (III)	(See Site-Specific or Aquatic Life Use Class Criteria)		16065-83-1
Chromium (VI)	(See Site-Specific or Aquatic Life Use Class Criteria)		18540-29-9
Copper	$(0.960)e^{(0.9422[\ln hardness]-1.700)}$ [c]	$(0.960)e^{(0.8545[\ln hardness]-1.702)}$ [d]	7440-50-8
Cyanide	(See Site-Specific or Aquatic Life Use Class Criteria)		57-12-5
Iron	(Reserved)	1,000[b]	7439-89-6
Lead[~~74~~]	$(CF)e^{(1.273[\ln hardness]-1.460)}$ [c]	$(CF)e^{(1.273[\ln hardness]-4.705)}$ [d]	7439-92-1
Manganese	(Reserved)	1,000[b,~~e~~]	7439-96-5
Mercury[~~85~~]	1.4[c]	0.77[d]	7439-97-6
Nickel	$(0.998)e^{(0.846[\ln hardness]+2.255)}$ [c]	$(0.997)e^{(0.846[\ln hardness]+0.0584)}$ [d]	7440-02-0
Selenium[~~9~~]	~~20[c]~~See 003.01C3	~~5.0[d]~~	7782-49-2
Silver	$(0.85)e^{(1.72[\ln hardness]-6.59)}$ [c]	(Reserved)	7440-22-4
Thallium	1400[a]	0.47[b,f]	7440-28-0
Zinc	$(0.978)e^{(0.8473[\ln hardness]+0.884)}$ [c]	$(0.986)e^{(0.8473[\ln hardness]+0.884)}$ [d]	7440-66-6
PCBs and Related Compounds:			
PCBs	2.0[a]	0.00064[b,e]	.....
Chlorinated Naphthalenes	1,600[a]	43,000[b,e]	.....
Halogenated Aliphatics:			

POLLUTANT	CRITERIA (µg/L~~ug/l~~) Acute	Chronic	CAS No.*
Halomethanes	11,000[a]	157[b,e]	.....
Bromoform	(Reserved)	~~1400[b,e]~~1,200[b,e]	75-25-2
Methyl bromide	(Reserved)	~~1,500[b,f]~~10,000[b,f]	74-83-9
Chloroform	28,900[a]	1,240[b]	67-66-3
Carbon tetrachloride	35,200[a]	~~16[b,e]~~50[b,e]	56-23-5
Methylene chloride	(Reserved)	~~5,900[b,e]~~3,000[b,f]	75-09-2
1,2-dichloroethane	118,000[a]	~~370[b,e]~~6,500[b,e]	107-06-2
Hexachloroethane	980[a]	~~33[b,e]~~0.8[b,f]	67-72-1
Pentachloroethane	7,240[a]	1,100[b]	76-01-7
Trichlorinated ethanes	18,000[a]	(Reserved)	25323-89-1
1,1,1-trichloroethane	(Reserved)	200,000[b,f]	71-55-6
1,1,2-trichloroethane	(Reserved)	~~160[b,e]~~-89[b,e]	79-00-5
Tetrachloroethanes	9,320[a]	(Reserved)	25322-20-7
1,1,2,2-tetrachloroethane	(Reserved)	~~40[b,e]~~30[b,e]	79-34-5
Dichloroethylenes	11,600[a]	(Reserved)	25323-30-3
1,1-dichloroethylene	(Reserved)	~~32[b,e]~~20,000[b,f]	75-35-4
~~1,2 trans-dichloroethylene~~ Trans-1,2-dichloroethylene	(Reserved)	~~10,000[b,f]~~4,000[b,f]	156-60-5
Tetrachloroethylene	5,280[a]	~~33[b,e]~~70[b,f]	127-18-4
Trichloroethylene	45,000[a]	~~300[b,e]~~30[b,f]	79-01-6
Chlorodibromomethane	(Reserved)	~~130[b,e]~~210[b,e]	124-48-1
Dichlorobromomethane	(Reserved)	~~170[b,e]~~270[b,e]	75-27-4
Dichloropropane	23,000[a]	5,700[b]	26638-19-7
1,2-dichloropropane	(Reserved)	~~150[b,e]~~310[b,e]	78-87-5
Dichloropropene	6,060[a]	244[b]	26952-23-8
1,3-dichloropropene	(Reserved)	~~210[b,e]~~120[b,e]	542-75-6
Hexachlorobutadiene	90[a]	~~9.3[b]~~0.02[b,f]	87-68-3
Hexachlorocyclopentadiene	7.0[a]	~~5.2[b]~~4.0[b,f]	77-47-4
Vinyl Chloride	(Reserved)	~~24[b,e]~~16[b,e]	75-01-4
Ethers:			
~~Bis(2-chloroethyl)ether~~ Bis(2-chloroethyl) Ether	(Reserved)	~~5.3[b,e]~~22[b,e]	111-44-4
~~Bis(2-chloroisopropyl)ether~~ Bis(2-chloro-1-methylethyl) Ether	(Reserved)	~~65,000[b,f]~~4,000[b,f]	108-60-1
~~Bis-chloromethyl ether~~ Bis(chloromethyl) Ether	(Reserved)	~~0.0078[b,e]~~0.17[b,e]	542-88-1
Chloroalkyl ethers	238,000[a]	(Reserved)	.....
Haloethers	360[a]	122[b]	.....

POLLUTANT	CRITERIA (µg/L~~ug/l~~) Acute	Chronic	CAS No.*
Monocyclic Aromatics except Phenols, Cresols, and Phthalates:			
Benzene	5,300[a]	~~510[b,e]~~90[b,f]	71-43-2
Chlorinated benzenes	250[a]	50[b]	.....
Chlorobenzene	(Reserved)	800[b,f]	108-90-7
1,2-dichlorobenzene	(Reserved)	~~1,300[b,f]~~3,000[b,f]	95-50-1
1,3-dichlorobenzene	(Reserved)	~~960[b,f]~~10[b,f]	541-73-1
1,4,-dichlorobenzene	(Reserved)	~~190[b,f]~~900[b,f]	106-46-7
Ethylbenzene	32,000[a]	~~2,100[b,f]~~130[b,f]	100-41-4
Hexachlorobenzene	6.0[a]	~~0.0029[b,e]~~0.00079[b,e]	118-74-1
Nitrobenzene	27,000[a]	~~690[b,f]~~600[b,f]	98-95-3
Pentachlorobenzene	(Reserved)	~~41[b,e]~~0.1[b,f]	608-93-5
1,2,4,5-tetrachlorobenzene	(Reserved)	~~29[b,e]~~0.03[b,f]	95-94-3
1,2,4-trichlorobenzene	(Reserved)	~~70[b,f]~~0.76[b,e]	120-82-1
Toluene	17,500[a]	~~15,000[b,f]~~520[b,f]	108-88-3
2,4-dinitrotoluene	330[a]	~~34[b,e]~~17[b,e]	121-14-2
Phenols and Cresols:			
Phenol	10,200[a]	2,560[b]	108-95-2
2-chlorophenol	4,380[a]	~~150[b,f]~~800[b,f]	95-57-8
3-methyl-4-chlorophenol	30[a]	~~(Reserved)~~2,000[b,f]	59-50-7
2,4-dichlorophenol	2,020[a]	~~290[b,f]~~60[b,f]	120-83-2
2,4,5-trichlorophenol	100[a]	63[b]	95-95-4
2,4,6-trichlorophenol	(Reserved)	~~24[b,e]~~6[b,f]	88-06-2
Dinitrophenols	(Reserved)	~~140,000[b,e]~~1,000[b,f]	25550-58-7
Nitrophenols	230[a]	150[b]	.....
Nonylphenol	28[c]	6.6[d]	1044-05-1
2-methyl-4,6-dinitrophenol	(Reserved)	~~280[b,f]~~30[b,f]	534-52-1
2,4-dinitrophenol	(Reserved)	~~5,300[b,f]~~300[b,f]	51-28-5
2,4-dimethylphenol	2,120[a]	~~850[b,f]~~3,000[b,f]	105-67-9
Phthalate Esters:			
Phthalate esters	940[a]	3.0[b]	.....
Butylbenzyl phthalate	(Reserved)	~~1,900[b,f]~~1.0[b,e]	85-68-7
Di-N-butyl phthalate	(Reserved)	~~4,500[b,f]~~30[b,f]	84-74-2
Diethyl phthalate	(Reserved)	~~44,000[b,f]~~600[b,f]	84-66-2
~~Di-2-ethylhexyl phthalate~~ Bis(2-ethylhexyl) Phthalate	2,000[a]	~~22[b,e]~~3.7[b,e]	117-81-7
Dimethyl phthalate	(Reserved)	~~1,100,000[b,e]~~2,000[b,f]	131-11-3
Polycyclic Aromatic Hydrocarbons (PAHs):			
Acenaphthene	1,700[a]	~~520[b]~~90[b,f]	83-32-9
Anthracene	(Reserved)	~~40,000[b,f]~~400[b,f]	120-12-7

POLLUTANT	CRITERIA (µg/L~~ug/l~~) Acute	Chronic	CAS No.*
Benzo(a)anthracene	(Reserved)	~~0.18[b,e]~~0.013[b,e]	56-55-3
Benzo(a)pyrene	(Reserved)	~~0.18[b,e]~~0.0013[b,e]	50-32-8
Benzo(b)fluoranthene	(Reserved)	~~0.18[b,e]~~0.013[b,e]	205-99-2
Benzo(k)fluoranthene	(Reserved)	~~0.18[b,e]~~0.13[b,e]	207-08-9
Chrysene	(Reserved)	~~0.18[b,e]~~1.3[b,e]	218-01-9
Dibenzo(a,h)anthracene	(Reserved)	~~0.18[b,e]~~0.0013[b,e]	53-70-3
Fluoranthene	3,980[a]	~~140[b,f]~~20[b,f]	206-44-0
Fluorene	(Reserved)	~~5,300[b,f]~~70[b,f]	86-73-7
Indeno(1,2,3-cd)pyrene	(Reserved)	~~0.18[b,e]~~0.013[b,e]	193-39-5
Naphthalene	2,300[a]	620[b]	91-20-3
2-chloronaphthalene	1,600[a]	~~1,600[b,f]~~1,000[b,f]	91-58-7
Phenanthrene	30[a]	6.3[b]	85-01-8
Pyrene	(Reserved)	~~4,000[b,f]~~30[b,f]	129-00-0
Nitrosamines and other Nitrogen-containing Compounds:			
Nitrosamines	5,850[a]	12.4[b,e]	.....
Benzidine	2,500[a]	~~0.0020[b,e]~~0.11[b,e]	92-87-5
3,3′-dichlorobenzidine	(Reserved)	~~0.28[b,e]~~1.5[b,e]	91-94-1
1,2-diphenylhydrazine	270[a]	2.0[b,e]	122-66-7
Acrylonitrile	7,550[a]	~~2.5[b,e]~~70[b,e]	107-13-1
N-nitrosodibutylamine	(Reserved)	2.2[b,e]	924-16-3
N-nitrosodiethylamine	(Reserved)	12.4[b,e]	55-18-5
N-nitrosodimethylamine	(Reserved)	30[b,e]	62-75-9
N-nitrosodiphenylamine	(Reserved)	60[b,e]	86-30-6
N-nitrosodi-N-propylamine	(Reserved)	5.1[b,e]	621-64-7
N-nitrosopyrrolidine	(Reserved)	340[b,e]	930-55-2

[*] Chemical Abstract Services Registry Number
[a] Concentration not to be exceeded at any time
[b] Twenty-four hour average concentration
[c] One-hour average concentration
[d] Four-day average concentration
[e] Human health criteria at the 10^{-5} risk level for carcinogens based on the consumption of fish and other aquatic organisms
[f] Human health criteria based on the consumption of fish and other aquatic organisms
~~[1] Benzene hexachloride or hexachlorocyclohexane~~
~~[2] Gamma-BHC~~
[1~~3~~] Dimethyl tetrachloroterephthalate
~~[4] Dichlorodiphenyltrichloroethane~~
[2~~5~~] 2,3,7,8-tetrachloro-dibenzo-p-dioxin or 2,3,7,8-TCDD

[36] Criteria for metals and inorganics apply to dissolved concentrations

[47] The conversion factor for lead (acute and chronic) is hardness dependent and defined by:

$$CF = 1.46203 - [(\ln hardness)(0.145712)]$$

[58] Chronic criterion for mercury applies to total recoverable concentrations

~~[8] Criteria for selenium apply to total recoverable concentrations~~

Appendix B

New and revised numeric criteria for the protection of Public Drinking Water Supply/human health water + organism, and revised, proper, naming for many substances. Underlined criteria values represent the new/revised criteria; strike-through criteria values represent deletions.

004.01B Numerical Criteria.

Numerical criteria for the parameters listed below ~~shall~~ are not to be exceeded. Any substance introduced directly or indirectly by human activity ~~shall~~ is not to be allowed to enter surface water if one or more of the following numerical standards would be exceeded. The numerical standards listed below are intended to protect beneficial use of public drinking water supply. If the natural background level of a parameter is greater than the numerical standard, this ~~shall~~ will not in and of itself prohibit the use of the surface water. If the natural background level of a parameter is greater than the numerical standard listed below, the background level ~~shall~~ is to be used in place of the numerical criteria.

POLLUTANT	NUMERICAL LIMIT	CAS #
Inorganics:		
Antimony [b]	0.0056 ~~mg/l~~mg/L	7440-36-0
Arsenic [~~eb~~]	~~0.010~~ 0.00018 ~~mg/l~~mg/L	7440-38-2
Asbestos [c]	7 million fibers/liter with fiber length >10 microns	1332-21-4
Barium [~~ea~~]	~~2.0~~ 1.0 ~~mg/l~~mg/L	7440-39-3
Beryllium [c]	0.004 ~~mg/l~~mg/L	7440-41-7
Cadmium [c]	0.005 ~~mg/l~~mg/L	7440-43-9
Chromium [c]	0.1 ~~mg/l~~mg/L	7439-92-1
Cyanide (as free cyanide) [~~ba~~]	~~0.14~~ 0.004 ~~mg/l~~mg/L	57-12-5
Fluoride [c]	4.0 ~~mg/l~~mg/L	7681-49-4
Mercury [c]	0.002 ~~mg/l~~mg/L	7439-97-6
Nitrate-nitrogen [c]	10 ~~mg/l~~mg/L	14797-55-8
Nitrite-nitrogen [c]	1 ~~mg/l~~mg/L	14797-65-0
Selenium [c]	0.05 ~~mg/l~~mg/L	7782-49-2
Thallium [b]	0.00024 ~~mg/l~~mg/L	7440-28-0
Organics:		
Alachlor [c]	0.002 ~~mg/l~~mg/L	15972-60-8
Atrazine [c]	0.003 ~~mg/l~~mg/L	1912-24-9
Benzene [~~ea~~]	~~0.005~~ 0.003 ~~mg/l~~mg/L	71-43-2
Benzo(a)pyrene [b]	~~0.000038~~ 0.0000012 ~~mg/l~~mg/L	50-32-8
Carbofuran [c]	0.04 ~~mg/l~~mg/L	1563-66-2
Carbon tetrachloride [b]	~~0.0023~~ 0.004 ~~mg/l~~mg/L	56-23-5
Chlorobenzene [c]	0.1 ~~mg/l~~mg/L	108-90-7
Chlordane [b]	~~0.000008~~ 0.0000031 ~~mg/l~~mg/L	57-74-9
cis-1,2-Dichloroethylene [c]	0.07 ~~mg/l~~mg/L	156-59-2
Dalapon [c]	0.2 ~~mg/l~~mg/L	75-99-0
Dibromochloropropane (DBCP) [c]	0.0002 ~~mg/l~~mg/L	96-12-8
Dichloromethane [c]	0.005 ~~mg/l~~mg/L	75-09-2

POLLUTANT	NUMERICAL LIMIT	CAS #
Di(2-ethylhexyl)adipate or Bis(2-ethylhexyl) adipate [c]	0.4 ~~mg/l~~mg/L	103-23-1
Di(2-ethylhexyl)phthalate or Bis(2-Ethylhexyl) Phthalate [ab]	~~0.006~~ 0.0032 ~~mg/l~~mg/L	117-81-7
Dinoseb [c]	0.007 ~~mg/l~~mg/L	88-85-7
Dioxin (2,3,7,8-TCDD) [b]	0.00000000005 ~~mg/l~~mg/L	1746-01-6
Diquat [c]	0.02 ~~mg/l~~mg/L	85-00-7
Endothall [c]	0.1~~mg/l~~mg/L	145-73-3
Endrin [a]	~~0.000059~~ 0.00003 ~~mg/l~~mg/L	72-20-8
Ethylbenzene [a]	~~0.53~~ 0.068 ~~mg/l~~mg/L	100-41-4
Ethylene dibromide [c]	0.00005 ~~mg/l~~mg/L	106-93-4
Glyphosate [c]	0.7 ~~mg/l~~mg/L	1071-53-6
Heptachlor [b]	~~0.00000079~~ 0.000000059 ~~mg/l~~mg/L	76-44-8
Heptachlor epoxide [b]	~~0.00000039~~ 0.00000032 ~~mg/l~~mg/L	1024-57-3
Hexachlorobenzene [b]	~~0.0000028~~ 0.00000079 ~~mg/l~~mg/L	118-74-1
Hexachlorocyclopentadiene [a]	~~0.04~~ 0.004 ~~mg/l~~mg/L	77-47-4
Lindane [c]	0.0002 ~~mg/l~~mg/L	58-89-9
Methoxychlor [ac]	~~0.04~~ 0.00002 ~~mg/l~~mg/L	72-43-5
o-Dichlorobenzene [ac]	~~0.42~~ 0.6 ~~mg/l~~mg/L	95-50-1
Oxamyl (Vydate) [c]	0.2 ~~mg/l~~mg/L	23135-22-0
2,4,5-TP Silvex [c]	0.05 ~~mg/l~~mg/L	93-72-1
2,4-D [c]	0.07 ~~mg/l~~mg/L	94-75-7
PCB's [b]	0.00000064 ~~mg/l~~mg/L	-----
Pentachlorophenol [ab]	~~0.001~~ 0.0003 ~~mg/l~~mg/L	87-86-5
Picloram [c]	0.5 ~~mg/l~~mg/L	1918-02-1
Simazine [c]	0.004 ~~mg/l~~mg/L	122-34-9
Styrene [c]	0.1 ~~mg/l~~mg/L	100-42-5
trans-1,2-Dichloroethylene [c]	0.1 ~~mg/l~~mg/L	156-60-5
1,2,4-Trichlorobenzene [ab]	~~0.035~~ 0.00071 ~~mg/l~~mg/L	120-82-1
Trichloroethylene [ac]	~~0.005~~ 0.003 ~~mg/l~~mg/L	79-01-6
Tetrachloroethylene [c]	0.005 ~~mg/l~~mg/L	127-18-4
Toluene [ac]	~~1.0~~ 0.057 ~~mg/l~~mg/L	108-88-3
Total trihalomethanes [c]	0.1 ~~mg/l~~mg/L	-----
Toxaphene [b]	~~0.0000028~~ 0.000007 ~~mg/l~~mg/L	8001-35-2
Vinyl chloride [b]	~~0.00025~~ 0.00022 ~~mg/l~~mg/L	75-01-4
Xylenes [c]	10.0 ~~mg/l~~mg/L	1330-20-7
1,2-Dichloropropane [c]	0.005 ~~mg/l~~mg/L	78-87-5
1,2-Dichloroethane [bc]	~~0.0038~~ 0.005 ~~mg/l~~mg/L	107-06-2
1,1-Dichloroethylene [c]	0.007 ~~mg/l~~mg/L	~~156-59-2~~ 75-35-4
1,1,1-Trichloroethane [c]	0.2 ~~mg/l~~mg/L	71-55-6

POLLUTANT	NUMERICAL LIMIT	CAS #
1,1,2-Trichloroethane [c]	0.005 ~~mg/l~~mg/L	79-00-5
p-Dichlorobenzene [a,c]	~~0.063~~ 0.075 ~~mg/l~~mg/L	106-46-7
Radionuclides:		
Beta particles and photon emitters [c]	4 millirems per year	-----
Combined radium-226 and radium-228 [c]	5 pCi/l	-----
Gross alpha particle activity (including radium-226 but excluding radon and uranium) [c]	15 pCi/l	-----
Uranium [c]	0.030 ~~mg/l~~mg/L	7440-61-1
Other Parameters Affecting Use:		
Aluminum [d]	0.2 ~~mg/l~~mg/L	7429-90-5
Chloride [d]	250 ~~mg/l~~mg/L	16887-00-6
Copper [d]	1 ~~mg/l~~mg/L	7440-50-8
Foaming Agents (methylene-blue active substances) [d]	0.5 ~~mg/l~~mg/L	-----
Iron [d]	0.3 ~~mg/l~~mg/L	7439-89-6
Manganese [d]	0.05 ~~mg/l~~mg/L	7439-96-5
Silver [d]	0.10 ~~mg/l~~mg/L	7440-22-4
Sulfate [d]	250 ~~mg/l~~mg/L	14808-79-8
Total Dissolved Solids [d]	500 ~~mg/l~~mg/L	-----
Zinc [d]	5 ~~mg/l~~mg/L	7440-66-6
Other Priority Pollutants		
Nickel [a]	0.61 ~~mg/l~~mg/L	7440-02-0
Acrolein [a]	~~0.006~~ 0.003 ~~mg/l~~mg/L	107-02-8
Acrylonitrile [b]	~~0.00051~~ 0.00061 ~~mg/l~~mg/L	107-13-1
Bromoform [b]	~~0.043~~ 0.07 ~~mg/l~~mg/L	75-25-2
Chlorodibromomethane [b]	~~0.004~~ 0.008 ~~mg/l~~mg/L	124-48-1
Chloroform [b,a]	~~0.057~~ 0.06 ~~mg/l~~mg/L	67-66-3
Dichlorobromomethane [b]	~~0.0055~~ 0.0095 ~~mg/l~~mg/L	75-27-4
1,3-Dichloropropene [b]	~~0.0034~~ 0.0027 ~~mg/l~~mg/L	542-75-6
Methyl Bromide [a]	~~0.047~~ 0.1 ~~mg/l~~mg/L	74-83-9
Methylene Chloride [b,a]	~~0.046~~ 0.04 ~~mg/l~~mg/L	75-09-2
1,1,2,2-Tetrachloroethane [b]	~~0.0017~~ 0.002 ~~mg/l~~mg/L	79-34-5
2-Chlorophenol [a]	~~0.081~~ 0.03 ~~mg/l~~mg/L	95-57-8
2,4-Dichlorophenol [a]	~~0.077~~ 0.01 ~~mg/l~~mg/L	120-83-2
2,4-Dimethylphenol [a]	~~0.38~~ 0.1 ~~mg/l~~mg/L	105-67-9

POLLUTANT	NUMERICAL LIMIT	CAS #
2-Methyl-4,6-Dinitrophenol [a]	~~0.013~~ 0.002 ~~mg/l~~mg/L	534-52-1
Dinitrophenols [a]	0.01 mg/L	25550-58-7
2,4-Dinitrophenol [a]	~~0.069~~ 0.01 ~~mg/l~~mg/L	51-28-5
Phenol [a]	~~10~~ 4 ~~mg/l~~mg/L	108-95-2
2,4,5-Trichlorophenol [a]	0.3 mg/L	95-95-4
2,4,6-Trichlorophenol [~~b~~a]	~~0.014~~ 0.003 ~~mg/l~~mg/L	88-06-2
3-Methyl-4-Chlorophenol [a]	0.5 mg/L	59-50-7
Acenaphthene [a]	~~0.67~~ 0.07 ~~mg/l~~mg/L	83-32-9
Anthracene [a]	~~8.3~~ 0.3 ~~mg/l~~mg/L	120-12-7
Benzidine [b]	~~0.00000086~~ 0.0000014 ~~mg/l~~mg/L	92-87-5
Benzo(a)Anthracene [b]	~~0.000038~~ 0.000012 ~~mg/l~~mg/L	56-55-3
Benzo(b)Fluoranthene [b]	~~0.000038~~ 0.000012 ~~mg/l~~mg/L	205-99-2
Benzo(k)Fluoranthene [b]	~~0.000038~~ 0.00012 ~~mg/l~~mg/L	207-08-9
Bis(2-Chloroethyl) Ether [b]	0.0003 ~~mg/l~~mg/L	111-44-4
~~Bis2-Chloroisopropyl Ether~~ Bis(2-Chloro-1-methylethyl) Ether [a]	~~1.4~~ 0.2 ~~mg/l~~mg/L	108-60-1
Bis(Chloromethyl) Ether [b]	0.0000015 mg/L	542-88-1
Butylbenzyl Phthalate [~~b~~a]	~~1.5~~ 0.001 ~~mg/l~~mg/L	85-68-7
2-Chloronaphthalene [a]	~~1.0~~ 0.8 ~~mg/l~~mg/L	91-58-7
Chrysene [b]	~~0.000038~~ 0.0012 ~~mg/l~~mg/L	218-01-9
Dibenzo(a,h)Anthracene [b]	~~0.000038~~ 0.0000012 ~~mg/l~~mg/L	53-70-3
1,3-Dichlorobenzene [a]	~~0.32~~ 0.007 ~~mg/l~~mg/L	541-73-1
3,3'-Dichlorobenzidine [b]	~~0.00021~~ 0.00049 ~~mg/l~~mg/L	91-94-1
Diethyl Phthalate [a]	~~17~~ 0.6 ~~mg/l~~mg/L	84-66-2
Dimethyl Phthalate [a]	~~270~~ 2.0 ~~mg/l~~mg/L	131-11-3
Di-n-Butyl Phthalate [a]	~~2.0~~ 0.02 ~~mg/l~~mg/L	84-74-2
2,4-Dinitro-toluene [b]	~~0.0011~~ 0.00049 ~~mg/l~~mg/L	121-14-2
1,2-Diphenlyhydrazine [b]	~~0.00036~~ 0.0003 ~~mg/l~~mg/L	122-66-7
Fluoranthene [a]	~~0.13~~ 0.02 ~~mg/l~~mg/L	206-44-0
Fluorene [a]	~~1.1~~ 0.05 ~~mg/l~~mg/L	86-73-7
Hexachlorobutadiene [~~b~~a]	~~0.0044~~ 0.00002 ~~mg/l~~mg/L	87-68-3
Hexachlorocyclohexane (HCH) – Technical [b]	0.000066 mg/L	608-73-1
Hexachloroethane [~~b~~a]	~~0.014~~ 0.0007 ~~mg/l~~mg/L	67-72-1
Indeno (1,2,3-cd)Pyrene [b]	~~0.000038~~ 0.000012 ~~mg/l~~mg/L	193-39-5
Isophorone [b]	~~0.35~~ 0.34 ~~mg/l~~mg/L	78-59-1
Nitrobenzene [a]	~~0.017~~ 0.01 ~~mg/l~~mg/L	98-95-3
N-Nitrosodimethylamine [b]	0.0000069 ~~mg/l~~mg/L	62-75-9
N-Nitrosodi-n-Propylamine [b]	0.00005 ~~mg/l~~mg/L	621-64-7

POLLUTANT	NUMERICAL LIMIT	CAS #
N-Nitrosodiphenylamine [b]	0.033 ~~mg/l~~mg/L	86-30-6
Pentachlorobenzene [a]	0.0001 mg/L	608-93-5
Pyrene [a]	~~0.83~~ 0.02 ~~mg/l~~mg/L	129-00-0
Aldrin [b]	~~0.00000049~~ 0.0000000077 ~~mg/l~~mg/L	309-00-2
~~alpha-BHC~~ alpha-Hexachlorocyclohexane (HCH) [b]	~~0.000026~~ 0.0000036 ~~mg/l~~mg/L	319-84-6
~~beta-BHC~~ beta-Hexachlorocyclohexane (HCH) [b]	~~0.000091~~ 0.00008 ~~mg/l~~mg/L	319-85-7
4,4'-DDT [b]	~~0.0000022~~ 0.0000003 ~~mg/l~~mg/L	50-29-3
4,4'-DDE [b]	~~0.0000022~~ 0.00000018 ~~mg/l~~mg/L	72-55-9
4,4'-DDD [b]	~~0.0000031~~ 0.0000012 ~~mg/l~~mg/L	72-54-8
Dieldrin [b]	~~0.00000052~~ 0.000000012 ~~mg/l~~mg/L	60-57-1
alpha-Endosulfan [a]	~~0.062~~ 0.02 ~~mg/l~~mg/L	959-98-8
beta-Endosulfan [a]	~~0.062~~ 0.02 ~~mg/l~~mg/L	33213-65-9
Endosulfan Sulfate [a]	~~0.062~~ 0.02 ~~mg/l~~mg/L	1031-07-8
Endrin Aldehyde [a]	~~0.00029~~ 0.001 ~~mg/l~~mg/L	7421-93-4

[a] Human health criteria based on the consumption of water, fish and other aquatic organisms
[b] Human health criteria at the 10^{-5} risk level for carcinogens based on the consumption of water, fish and other aquatic organisms
[c] Primary Drinking Water MCL
[d] Secondary Drinking Water Standard