UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
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ATLANTA, GEORGIA 30303-8960

APR 6 2016

Mr. Jay Zimmerman
Director
Division of Water Resources
North Carolina Department of Environment
and Natural Resources
1617 Mail Service Center
Raleigh, North Carolina 27604

Dear Mr. Zimmerman:

The United States Environmental Protection Agency has completed its review of the State of North Carolina's 2007 – 2015 Triennial Review of Water Quality Standards (WQS). All of the Triennial Review revisions were approved for adoption by the North Carolina Environmental Management Commission on November 13, 2014, and became effective for state purposes on January 1, 2015. In a letter dated May 1, 2015, the State of North Carolina Department of Justice certified that the WQS revisions, Surface Water and Wetland Standards (15A NCAC 02B .0200) had been duly adopted according to state law. On May 15, 2015, the EPA received the original signed package for review from the Division of Water Resources.

The EPA's decision on these revisions is detailed in the enclosed document, *Decision Document of the United States Environmental Protection Agency Review of North Carolina's 2007 - 2015 Triennial Review of Changes to Surface Waters and Wetlands Standards 15A NCAC 02B .0200 Under Section 303(c) of the Clean Water Act.* The approved portion of the new and revised WQS adopted by the State include upgrades to toxic criteria to meet national recommendations for arsenic, chromium III, chromium VI, copper, lead, nickel, silver and zinc and a scientifically defensible alternative for cadmium for non-trout waters. The EPA is also approving the removal of a numeric Action Level for iron and the numeric criterion for manganese (Water Supply waters only). Both parameters will be controlled through the use of a narrative WQS.

The EPA is disapproving revisions relating to biological confirmation for toxics in assessment and three revisions relating to the implementation of the hardness based equations for metals under the National Pollutant Discharge Elimination System (NPDES) permits, including the use of action levels, the use of a low end hardness cap, and the use of the median of the 8-digit hydrologic unit for determining hardness when developing NPDES permits. These revisions are inconsistent with the requirements of 40 C.F.R. Part 131 and the Clean Water Act (CWA) and therefore, are disapproved. The EPA recommends that NCDENR remove these provisions during the next rulemaking.

In addition to the EPA's review pursuant to section 303 of the CWA, section 7(a)(2) of the Endangered Species Act (ESA) requires federal agencies, in consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), to ensure that their actions are not likely to jeopardize the continued existence of federally listed species or result in the destruction or adverse

modification of designated critical habitat of such species. The EPA's decision to approve the revisions contained in the enclosed decision document is subject to the results of consultation under section 7 of the ESA with the USFWS and NMFS office. The EPA will notify NCDENR of the results of the section 7 consultation upon completion of the action.

We would like to commend you and your staff on the completion of this Triennial Review and your continued efforts in environmental protection for the State of North Carolina. In particular, we would like to acknowledge the technical expertise and the hard work of Connie Brower shown during the development of these WQS.

Should you have any questions regarding the EPA's action today, please contact me at (404) 562-8357 or have a member of your staff contact Ms. Lisa Perras Gordon at gordon.lisa-perras@epa.gov or (404) 562-9317.

Sincerely,

Heather McTeer Toney
Regional Administrator

Enclosure

cc: Connie Brower
NCDWR WQS

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Decision Document of the United States Environmental Protection Agency Review of North Carolina's 2007-2015 Triennial Review of Changes to Surface Waters and Wetlands Standards 15A NCAC 02B .0200 Under Section 303(c) of the Clean Water Act

Introduction

In a letter dated May 4, 2015, from S. Jay Zimmerman, Director, Division of Water Resources (DWR), North Carolina Department of Environment and Natural Resources, to Heather McTeer Toney, Regional Administrator of the Environmental Protection Agency's (EPA's) Region 4 Office, the DWR submitted new and revised water quality standards (WQS) for review under section 303(c) of the Clean Water Act (CWA or Act). In a letter dated May 1, 2015, the State of North Carolina Department of Justice certified that the WQS revisions, Surface Water and Wetland Standards (15A NCAC 02B .0200) had been duly adopted according to State law. The revisions addressed in this decision document were approved for adoption by the North Carolina Environmental Management Commission on November 13, 2014, and became effective for state purposes on January 1, 2015. The EPA received the original signed package for review from DWR on May 15, 2015.

Clean Water Act Requirements

Section 303 of the CWA, 33 U.S.C. § 1313, requires states to establish WQS and to submit any new or revised standards to the EPA for review and approval or disapproval. The EPA's implementing regulations require states to adopt water quality criteria that protect the designated use. See 40 C.F.R. 131.11(a). Such criteria must be based on a sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. Id. For waters with multiple use designations, the criteria shall support the most sensitive use. Id. In addition, the EPA's regulations require that in establishing criteria, a state shall consider WQS of downstream waters and shall ensure that its WQS provide for the attainment and maintenance of WQS of downstream waters. See 40 C.F.R. 131.10(b). A state's submission of water quality criteria must include (1) the methods used and analyses conducted to support WQS revisions, (2) water quality criteria sufficient to protect the designated uses and (3) a certification by the State Attorney General or other appropriate legal authority within the state that the WQS were duly adopted under state law. See 40 C.F.R. 131.6.

Endangered Species Act Requirements

In addition to the EPA's review under section 303 of the CWA, section 7(a)(2) of the Endangered Species Act (ESA) requires federal agencies, in consultation with the Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service (NMFS), to ensure that their actions are not likely to jeopardize the continued existence of federally listed species or result in the destruction or adverse modification of designated critical habitat of such species. With regard to consultation activities for section 7 of the ESA, the EPA Region 4 concluded that the WQS the Agency approved, would either have no effect or may affect, but not likely to adversely affect, threatened and endangered species or their designated critical habitat. The EPA also concluded that they had no discretion for some provisions of the approved WQS because they were derived to protect human health and the EPA has no discretion to revise an otherwise approvable human health criterion to benefit listed species.

The EPA's Decision Summary

The EPA commends the DWR for making revisions to its WQS to bring them up-to-date with long overdue changes. In particular, the State should be commended for adopting the EPA's national recommended criteria developed under CWA section 304(a) or other scientifically justified criteria for toxic metals as well as for adopting both acute and chronic values for those metals. The EPA's 304(a) recommendations provide an extensive technical basis and justification for how the recommended aquatic life criteria adequately protect aquatic life uses. The methodologies have been subject to public review, as have the individual criteria guidance documents. The methodologies have also been reviewed by EPA's Science Advisory Board (SAB) of external experts. While some of the methodologies that the EPA relied on in reaching this decision may be 20 years old, based on data and information considered over the years, EPA considers the science underpinning those recommendations to still be sound.

The goals of the CWA in section 101(a)(3) state that, "it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited." In the California Toxics Rule (CTR), 65 Fed. Reg. 31,682 (page 31,683) (May 18, 2000), the EPA reaffirmed that in order to achieve the goals and objectives of the Act, toxic pollutants must be controlled. Adopting scientifically defensible water quality standards for toxics establishes water quality goals for State and EPA programs, including providing a precise basis for developing water quality-based effluent limits for National Pollutant Discharge Elimination System (NPDES) permitting under section 402 of the Act; monitoring, assessment, development of Total Maximum Daily Loads (TMDLs); protecting coastal water quality improvement; protecting aquatic ecosystems and human health; and providing endpoints for nonpoint source controls and overall ecological protection. See 65 Fed. Reg. (page 31683). In addition, these standards will be used in other applications such as the State's authority to review federal permits under section 401 of the Act and reviews under the section 404(b)(1) guidelines. North Carolina's action fulfills the statutory requirement under section 303(c)(2)(B) of the CWA.

In particular, the EPA notes that for the first time, the DWR will have scientifically defensible criteria in place for all purposes under the Act for copper, hexavalent chromium, silver and zinc. Additionally, the value for lead, previously almost twenty times higher than recommended, will be consistent with national recommendations. Similarly, the State will now have updated criteria for cadmium in trout waters and nickel consistent with national recommendations. The EPA also supports the added provision to the State's new metal criteria to use the dissolved fraction and to allow the inclusion of water effect ratios directly into the criteria for metals.

The EPA welcomed the opportunity to work with the DWR to address those areas where the State sought to tailor its WQS to conditions within the state rather than to adopt the EPA Section 304(a) national recommendations, as allowed under 40 C.F.R. 131.11. Specifically, the EPA is approving DWR's alternate chronic and acute cadmium criteria for non-trout waters, the removal of iron criteria for aquatic life protection, and the removal of manganese as an organoleptic criteria for waters designated as water supply (WS). The EPA notes that protections will remain in place for all parameters through the use of a narrative water quality standard. Each of these provisions are being approved today as detailed below.

The new and revised WQSs that EPA is approving today are now the applicable water quality standards for all purposes under the CWA, including but not limited to monitoring, assessment, and NPDES permitting. Water quality criteria are intended to protect the designated use (40 C.F.R. 131. 2 and 131.11). Further, 40 C.F.R. 131.2 clarifies that state WQS are to:

"...protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act (the Act). "Serve the purposes of the Act" (as defined in section 101(a)(2) and 303(c) of the Act) means that water quality standards should, wherever attainable, provide water quality for the protection and propagation of fish, shellfish and wildlife, recreation in and on the water, and agricultural, industrial, and other purposes including navigation.

Such standards serve the dual purposes of establishing the water quality goals for a specific water body and serve as the regulatory basis for the establishment of water-quality-based treatment controls and strategies beyond the technology-based levels of treatment required by sections 301(b) and 306 of the Act."

Throughout this triennial review, the EPA has repeatedly and clearly articulated to North Carolina, both verbally and in writing, the Agency's position that certain proposed WQS could not be approved if submitted to the EPA. Consistent with that position and the EPA's publicly available record, the EPA is disapproving the sections of the DWR's water quality standards allowing alternative approaches for the implementation of the newly approved toxics criteria for some purposes under the Act. Specifically, the "biological confirmation" for assessment and the "action levels" for NPDES permitting are disapproved for all purposes under the Act. The State has now adopted separate, more stringent numeric criteria that are approved for all purposes under the CWA and must be implemented in NPDES permits as required by the EPA's national permitting regulations and monitoring and assessment programs. The State's separate "biological confirmation" and "action levels" provisions are not protective of the designated uses. In addition, the EPA communicated its concern with the use of a median instream hardness when calculating hardness dependent metals criteria, another provision designed to allow an alternative approach in NPDES permitting for implementing the State's toxics criteria, because median hardness does not protect designated uses in all waters. EPA also communicated its concern that the State has not demonstrated that the low end hardness cap provision protects designated uses of waters with a hardness below the cap. Therefore, the EPA is also disapproving the median hardness and low end hardness cap WQS.

Finally, numerous changes were made to the structure and formatting of the WQS and each of those changes were reviewed. Where those did not result in substantive changes to the WQS, the EPA is approving the revisions as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of these non-substantive changes does not re-open the EPA's prior approval of the underlying substantive WQSs. Where the revisions were a substantive change to WQS, the EPA reviewed and made individual decisions regarding those changes as detailed below. Where the revisions were not considered changes to WQS, the Agency did not take action, as noted below. During this triennial, the State also provided an opportunity to accept comments on and conducted a review of the variances to water quality standards for Evergreen Paper Products, Mount Olive Pickle Company and Bay Valley Foods. The EPA continues to work with the State on the ongoing review of these water quality standards variances as noted below.

North Carolina should be extremely proud of these revisions to its WQS and the technical expertise demonstrated by its staff and management in the completion of this extended review. Each of the DWR's WQS revisions is addressed in detail below along with the EPA's analysis and decision.

15A NCAC 02B .0200 Classifications and Water Quality Standards Applicable to Surface Waters and Wetlands

Throughout the Classifications and Water Quality Standards Applicable to Surface Waters and Wetlands section .0200, several editorial revisions were made replacing commonly used terms with synonymous terms. For example, the word "which" was changed to "that." These revisions do not alter the meaning or intent of the previously approved corresponding provisions as they are considered editorial. A copy of the revised WQS with these changes highlighted in yellow is provided in Appendix A: Non-Substantive Word Changes. The EPA approves the non-substantive word change revisions in Appendix A as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of these non-substantive changes does not re-open the EPA's prior approval of the underlying substantive WQSs.

15A NCAC 02B .0206 Flow Design Criteria for Effluent Limitations

Subsection 15A NCAC 02B .0206(a)(3) was amended to add:

> *(3) Toxic substance standards to protect aquatic life from acute toxicity shall be protected using the 1Q10 flow.*

In the EPA's *Technical Guidance Manual for Performing Wasteload Allocation. Book IV: Design Conditions,* Chapter 1 (EPA 1986a), the EPA discusses and recommends two methods for determining design flows for calculating effluent limits, the hydrologically-based method and the biologically-based method. Those design flows should be used to calculate both the Criterion Continuous Concentration (CCC, the 4-day average concentration of a pollutant that should not be exceeded more than once every three years on the average also known as the 'chronic' toxicity) and Criterion Maximum Concentration (CMC, the one hour average concentration in ambient water that should not be exceeded more than once every three years on average, also known as the 'acute' toxicity). The EPA recommends the use of the 1Q10 flow as the hydrologically-based design flow for the CMC and the 7Q10 as the hydrologically-based design flow for the CCC. The North Carolina WQS already includes a provision for the 7Q10 design flow for chronic toxicity (15A NCAC 02B .0206 (a)(2)). This revision adds the 1Q10 flow that will now be applicable for the new acute criteria that are being adopted during this triennial. Note: in this context the flow values that are listed are solely to be used for the calculation of water quality based effluent limitations as discussed under 15A NCAC 02B .0206(a). They do not indicate or refer to in any manner setting actual instream flows.

Considering the scientific and technical information supporting the EPA's Guidance, the EPA concludes that this change to subsection 15A NCAC 02B .0206 is consistent with the CWA section 303(c), 40 C.F.R. sections 131.11 and 131.13, and the EPA's guidance on stream design flows that are protective of aquatic life. This change is protective of the designated use. Therefore, this change is approved by the EPA under CWA section 303(c).

15A NCAC 02B .0211 Fresh Surface Water Quality Standards for Class C Waters
General paragraph and Subparagraphs (1) through (10)

The following revisions were made to the General opening paragraph and subparagraphs (1) through (10) of Section 15A NCAC 02B .0211.

> *General. The water quality standards for all fresh surface waters ~~are~~ shall be the basic standards applicable to all Class C waters. ~~See Rule .0208 of this Section for standards for toxic substances and temperature.~~ Water quality standards for temperature and numerical water quality standards for the protection of human health applicable to all fresh surface waters are in Rule .0208 of this Section.*

The language regarding the reference to Rule .0208 was changed in this paragraph. The applicability of Rule .0208 to freshwaters of North Carolina has not been changed, nor has the content of Rule .0208 been changed. The EPA has reviewed this change and determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

The General paragraph was also modified as follows:

> *Additional and more stringent standards applicable to other specific freshwater classifications are specified in Rules. .0212, .0214, .0215, .0216, ~~.0217,~~ .0218, .0219, .0223, .0224 and .0225 of this Section.*

Subparagraph .0217 was repealed with an effective date of January 1, 1988. There are no provisions under that Rule. Therefore, reference to that Rule has been removed. The EPA has reviewed this change and determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

The following sentence was added as the final sentence to the general paragraph:

> *Action levels for purposes of National Pollutant Discharge Elimination System (NPDES) permitting are specified in Item (22) of this Rule.*

The EPA has reviewed this change and determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs. For the substantive discussion of the EPA's decision regarding revisions to action levels in fresh surface waters, see page 28.

The following subparagraphs were renumbered for alphanumeric reordering only:

(1) Best Usage of Waters
(2) Conditions Related to Best Usage
(4) Chlorophyll a (corrected)
(6) Dissolved Oxygen
(8) Floating Solids, settleable solids, or sludge deposits

(10) Gases, total dissolved.

There were no other changes to these standards except for the numbering. The EPA has reviewed these changes and determined that they are non-substantive and therefore, the EPA approves these revisions as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that this approval of these non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.
Subparagraph (3) was amended as follows:

~~*(3) Quality standards applicable to all fresh surface waters:*~~

This sentence came before all of the criteria in the old format prior to the alphabetical reorganization of the WQS. The State indicated that this sentence was found to be redundant with the information in the General paragraph. The General paragraph listed just above this states that the WQS "…for all fresh surface waters are the basic standards applicable to Class C waters." 15A NCAC 02B .0101 General Procedures provides a definition for Class C waters which includes that "*Class C: freshwaters protected for secondary recreation, fishing, aquatic life including propagation and survival, and wildlife. All freshwaters shall be classified to protect these uses at a minimum.*" The EPA has reviewed this change and determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

New subparagraph (3) was created:

(3) Chlorine, total residual: 17 ug/l;

This revision moves chlorine from its previous location at Rule .0211(3)(l)(iv) without revision in order to alphabetize the criteria. The EPA has reviewed this change and determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

New subparagraph (5) was created:

(5) Cyanide, total: 5.0 ug/L;

The new paragraph moves cyanide from its previous location at Rule .0211(3)(l)(vi) and retains the same numeric value. Therefore, this revision is a non-substantive change to WQSs and the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

However, the original cyanide criterion included the following language after the numeric criteria that is no longer included, "*…unless site-specific criteria are developed based upon the aquatic life at the site utilizing The Recalculation Procedure in Appendix B of Appendix L in the Environmental Protection Agency's Water Quality Standards Handbook hereby incorporated by reference including any subsequent amendments.*" That language is struck out in the original location and not carried over to the new criterion's location.

States are not required to utilize the site-specific procedures, therefore the EPA concludes that this change to subsection 15A NCAC 02B .0211(11)(a)(5) is consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. Therefore, this change is approved by the EPA under CWA section 303(c). North Carolina notes that the site-specific criterion for cyanide has never been used since its original adoption. According to the state, Rule .0226 Exemptions from Surface Water Quality Standards, may be modified in the next triennial to include reference to the Handbook procedures that will allow the State to develop site-specific criteria. Until such time, the language allowing the use of the site-specific criteria has been removed and cannot be used for CWA purposes.

New paragraph (7) was added to move the criteria for fecal coliform into alphabetical order.

(7) Fecal coliform:

The fecal coliform criteria was previously Rule .0211(3)(e) and included the language "*Organisms of the coliform group:*" in front of the criteria. Those introductory words have been replaced with the words "*Fecal coliform:.*" No other changes were made to the criteria. The EPA has reviewed this change and determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

New paragraph (9) was added to move the criterion for fluorides from Rule .0211(3)(l)(vii) in order to alphabetize the criteria, as follows:

(9) Fluorides: 1.8 mg/l;

The numeric value of the criterion did not change. The EPA has reviewed this change and determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

15A NCAC 02B .0211 Fresh Surface Water Quality Standards for Class C Waters Subparagraph (11)(a)

A new subparagraph under 15A NCAC 02B .0211(11)(a) has been added as follows:

(11) Metals:

(a) *With the exception of mercury and selenium, freshwater aquatic life standards for metals shall be based upon measurement of the dissolved fraction of the metal. Mercury and selenium water quality standards shall be based upon measurement of the total recoverable metal.*

The DWR did not adopt updated criteria for mercury or selenium, leaving in place the previous values which are based on the total recoverable metal. Therefore, the reference to those parameters in the first sentence is a non-substantive change to standards. The EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

The EPA's most current national recommended water quality criteria for protection of aquatic life include the recommendation that fresh and salt water criteria for metals (including specifically arsenic, cadmium,

chromium III, chromium VI, copper, lead, nickel, silver and zinc) be expressed in terms of the dissolved metal in the water column (EPA 1993). The EPA further stated in this guidance that "[t]he use of dissolved metal to set and measure compliance with water quality standards is the recommended approach, because dissolved metal more closely approximates the bioavailable fraction of metal in the water column than does total recoverable metal."

Considering the scientific and technical information supporting the 304(a) recommendations, the EPA concludes that this change to subsection 15A NCAC 02B .0211(11)(a) is consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. Therefore, this change is approved by the EPA under CWA section 303(c).

15A NCAC 02B .0211 Fresh Surface Water Quality Standards for Class C Waters Subparagraph (11)(b)

A new subparagraph 11(b) was added as follows that adds and revises criteria for non-hardness dependent metals and includes the ability to conduct a water effect ratio (WER) as follows:

> *(11) Metals:*
> *(b) Freshwater metals standards that are not hardness-dependent shall be as follows:*
> *(i) Arsenic, dissolved, acute: WER· 340 ug/l;*
> *(ii) Arsenic, dissolved, chronic: WER· 150 ug/l;*
> *(iii) Beryllium, dissolved, acute: WER· 65 ug/l;*
> *(iv) Beryllium, dissolved, chronic: WER· 6.5 ug/l;*
> *(v) Chromium VI, dissolved, acute: WER· 16 ug/l;*
> *(vi) Chromium VI, dissolved, chronic: WER· 11 ug/l;*
> *(vii) Mercury, total recoverable, chronic: 0.012 ug/l;*
> *(viii) Selenium, total recoverable, chronic: 5 ug/l;*
> *(ix) Silver, dissolved, chronic: WER· 0.06 ug/l;*

With the adoption of these criteria under 15A NCAC 02B .0211(11)(b), North Carolina's water quality criteria for non-hardness dependent metals, listed above, are consistent with the EPA's most current national recommended water quality criteria or derived using an EPA recommended approach as detailed below.

Arsenic

In this revision, North Carolina adopted the EPA's most recent national recommendation of 340 ug/l as an acute criterion for arsenic in freshwater. This is the first time that North Carolina has had an acute criterion for arsenic.

The State revised its chronic freshwater criterion for arsenic to adopt the EPA's most current recommended value of 150 ug/l replacing the previous State criterion of 50 ug/l (EPA 1995). The State noted in its adoption of this value that, "[c]urrent arsenic water quality standards designed for the protection of human health in *all* waters of the state remains at 10 ug/l, measured as total recoverable arsenic. The DWR maintains this protective standard which is equivalent to the current National Drinking Water standard." 40 C.F.R. section 131.11 states, "[f]or waters with multiple use designations, the criteria shall support the most sensitive use." In this instance, the human health value of 10 ug/l would be the criteria supporting the most sensitive use applicable to all waters of the State.

Considering the scientific and technical information supporting the 304(a) recommendations, the EPA has determined that the changes to subsections 15A NCAC 02B .0211(11)(b)(i) and (ii) protect North Carolina's aquatic life use and, therefore, are consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. These changes are approved by the EPA under CWA section 303(c).

Beryllium

In this revision, North Carolina adopted an acute criterion for beryllium in freshwater of 65 ug/l. This is the first time that the State has adopted an acute value for beryllium. In 1980, the EPA concluded that an acute freshwater criterion could not be calculated due to a limited toxicity data base (EPA 1980a). Therefore, the EPA does not have an acute water quality recommendation for beryllium. The 1980 EPA report did note that acute toxicity could occur at concentrations as low as 130 ug/l. North Carolina used the acute data from the 1980 report and derived its acute freshwater criterion in a manner that is consistent with the EPA's *1985 Guidelines for Deriving Numerical National Water Quality Criteria for the Protection Of Aquatic Organisms and Their Uses* ("1985 Guidelines," EPA 1985).

North Carolina's methodology for deriving acute criteria for beryllium is scientifically defensible and results in values that protect North Carolina's aquatic life use. The EPA concludes that the change to subsection 15A NCAC 02B .0211(11)(b)(iii) is consistent with the CWA and 40 C.F.R. section 131.11. Therefore, this change is approved by the EPA under CWA section 303(c).

The State is maintaining its chronic freshwater criterion for beryllium of 6.5 ug/l. For alphabetizing purposes the chronic beryllium criterion was moved from 15A NCAC 02B .021(3)(l)(ii) to 15A NCAC 02B .0211(11)(b)(iv), which is a non-substantive change to standards and therefore the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

Chromium VI

Before these revisions, North Carolina did not have criteria for chromium III or chromium VI, instead having a single chronic value for total recoverable chromium of 50 ug/l. In this Rule, North Carolina is adopting the EPA's national recommended criteria for chromium VI of 16 ug/l (acute) and 11 ug/l (chronic) (EPA 1995).

Considering the scientific and technical information supporting the 304(a) recommendations, the EPA has determined that the changes to subsections 15A NCAC 02B .0211(11)(b)(v) and (vi) protect North Carolina's aquatic life use and, therefore, are consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. These changes are approved by the EPA under CWA section 303(c).

Mercury and Selenium

The EPA notes that the numeric values for both mercury and selenium were not changed during this triennial review. The numeric criterion for mercury was moved from 15A NCAC 02B .021(3)(l)(ix) to 15A NCAC 02B .0211(11)(b)(vii) for alphabetizing purposes only. The numeric criterion for selenium was moved from 15A NCAC 02B .021(3)(l)(xiii) to 15A NCAC 02B .0211(11)(b)(viii) for alphabetizing purposes only. As the numeric value did not change for either of these criteria, the EPA determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the

EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

Silver

In this revision, North Carolina is adopting a chronic water quality criterion for silver of 0.06 ug/l in subsection 15A NCAC 02B .0211(11)(b)(ix) of this Rule. Currently, the EPA does not have a national recommended chronic criteria for silver. The State calculated this criterion using the lowest LC50 for total recoverable silver of 1.2 ug/l and multiplying it by a safety factor of 0.05. These calculations are consistent with previously approved procedures for the calculation of toxics criteria for the protection of aquatic life under subsection 15A NCAC .0208 (a)(1) Standards for Toxic Substances and Temperature.

North Carolina's methodology for deriving chronic criteria for silver is scientifically defensible and results in values that protect North Carolina's aquatic life use. The EPA concludes that the change to subsection 15A NCAC 02B .0211(11)(b)(ix) protects North Carolina's aquatic life use and, therefore, is consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. This change is approved by the EPA under CWA section 303(c).

The above changes are summarized in the table below for ease of reference.

Metal (all values are dissolved)	**NCDWR's Previous Criteria (ug/l)**	**NCDWR New/Revised Criteria (ug/l)**	**EPA's Recommended Criteria (ug/l)**	**EPA's Reference for Recommended Criteria**
Arsenic (acute)	--	340	340	EPA 1995
Arsenic (chronic)	50 ug/l	150	150	
Beryllium (acute)	--	65	--	N/A
Beryllium (chronic)	6.5	6.5	--	
Chromium VI (acute)	--	16	16	EPA 1995
Chromium VI (chronic)	--	11	11	
Silver (chronic)	0.06 Action Level only	0.06	--	N/A

Water Effect Ratios

The following was added underneath the non-hardness dependent criteria in Subparagraph 11(b):

> *With the exception of mercury and selenium, acute and chronic freshwater aquatic life standards for metals listed in this Subparagraph apply to the dissolved form of the metal and apply as a function of the pollutant's water effect ratio (WER). A WER expresses the difference between the measures of the toxicity of a substance in laboratory waters and the toxicity in site water. The WER shall be assigned a value equal to one unless any person demonstrates to the Division's satisfaction in a permit proceeding that another value is developed in accordance with the "Water Quality Standards Handbook: Second Edition"*

published by the US Environmental Protection Agency (EPA-823-B-12-002), free of charge, at http://water.epa.gov/scitech/swguidance/standards/handbook, hereby incorporated by reference including any subsequent amendments. Alternative site-specific standards may also be developed when any person submits values that demonstrate to the Commissions' satisfaction that they were derived in accordance with the "Water Quality Standards Handbook: Second Edition, Recalculation Procedure or the Resident Species Procedure", hereby incorporated by reference including subsequent amendments at http://water.epa.gov/scitech/swguidance/standards/handbook/. This material is available free of charge.

This provision allows the use of a WER directly for each of the above non-hardness dependent metals (criteria x WER). The DWR provides the citation for the EPA Water Quality Standards Handbook, incorporated by reference including any amendments ("WQS Handbook," EPA 2014). Within the WQS Handbook, Appendix L, *Interim Guidance on Determination and Use of Water-Effect Ratios for Metals* ("WER Guidance", EPA 1994a), including the transmittal memo, "Use of the Water-Effect Ratio in Water Quality Standards (EPA 1994b), provides specific details on the applicability of WERs and how to develop WERs for site-specific criteria for metals. The WER guidance notes that one of the options under 40 C.F.R. 131.11 (b)(1) allows states to establish criteria based on 304(a) Guidance modified to reflect site-specific conditions. The WER transmittal memo notes that site-specific criteria are subject to EPA review and approval/disapproval under section 303(c) of the CWA. The two options allowed for this review are:

Option 1: A state may derive and submit each individual water-effect ratio determination to EPA for review and approval.

Option 2: A State can amend its water quality standards to provide a formal procedure with includes derivation of water-effects ratios, appropriate definition of sites, and enforceable monitoring provisions to assure that designated uses are protected. Both this procedure and the resulting criteria would be subject to full public participation requirements. Public review of a site-specific criterion could be accomplished in conjunction with the public review required for permit reissuance. EPA would review and approve/disapprove this protocol as a revised standard once. For public information, we recommend that once a year the State publish a list of site-specific criteria.

By referencing the procedures in the WQS Handbook, which includes the WER Guidance and the WER transmittal memo, the DWR has chosen to proceed with Option 2, adopting the EPA's protocol and all associated procedures to conduct WERs. The requirements for public review of a WER will be incorporated through the permit process. The State has chosen to include a WER of 1 in the WQS, which the EPA considers a "rebuttable presumption until a site-specific WER is derived." National Toxics Rule (NTR), 57 Fed. Reg. (page 60,866) (December 22, 1992). The WER Transmittal memo emphasizes that ". . . although a water-effect ratio affects permit limits for individual dischargers, it is the State in all cases that determines if derivation of a site-specific criterion based on the water-effect ratio is allowed and it is the State that ensures that the calculations and data analysis are done completely and correctly." The EPA strongly recommends that the first WERs developed by the State are reviewed in the study plan phase by the EPA to ensure that WERs that are developed meet the required procedures. The EPA looks forward to working with the State to ensure a quick review of the study plans.

This section also allows for alternative site-specific standards to be developed using the Recalculation Procedure or the Resident Species Procedure in accordance with the WQS Handbook. In deriving site-specific criteria, the Recalculation Procedure (found at Appendix A of Appendix L of the WQS

Handbook) takes into account the differences in sensitivities between the species used in the national dataset in developing the national recommended criteria and the organisms at the site. The Resident Species Analysis (see Chapter 3.7 - Developing Site-Specific Criteria of the WQS Handbook) accounts for that difference as well as the difference between the toxicity of the metal in lab water versus site water similar to a WER. Chapter 3.6 - Policy on Aquatic Life Criteria for Metals was updated to also include procedures to conduct a Streamlined Water-Effects Ratio Procedure for the Discharge of Copper that may be used.

The EPA concludes that the changes to subsection 15A NCAC 02B .0211(11)(b) to add the use of a WER and to include a WER multiplier in each of the criteria is consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. Therefore, these changes are approved by the EPA under CWA section 303(c).

The following provision was added at the end of this subparagraph:

Hardness-dependent freshwater metals standards are located in Sub-Item (c) and (d) and in Table A: Dissolved Freshwater Standards for Hardness-Dependent Metals;

The EPA has reviewed this change and determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

15A NCAC 02B .0211 Fresh Surface Water Quality Standards for Class C Waters Subparagraph (11)(c)(i)

A new subsection 11(c)(i) was added as follows:

> *(11) Metals:*
>
> *(c) Hardness-dependent freshwater metals standards shall be as follows:*
>
> *(i) Hardness-dependent metals standards shall be derived using the equations specified in Table A: Dissolved Freshwater Standards for Hardness-Dependent Metals. If the actual instream hardness (expressed as $CaCO_3$ or Ca+Mg) is less than 25 milligrams/liter (mg/l), standards shall be calculated based upon 25 mg/l hardness. If the actual instream hardness is greater than 25 mg/l and less than 400 mg/l, standards shall be calculated based upon the actual instream hardness. If the instream hardness is greater than 400 mg/l, the maximum applicable hardness shall be 400 mg/l;*

Section 15A NCAC 02B .0211(11)(c)(i) identifies the hardness value to be used in the newly adopted hardness based equations found in Table A (located after 15A NCAC 02B .0211(11)(d) Alternatives). As stated in the CTR, the EPA has found that "hardness and/or other water quality characteristics that are usually correlated to hardness can reduce or increase the toxicities of some metals. Hardness is used as a surrogate for a number of water characteristics which affect the toxicity of metals in a variety of ways." See 65 Fed. Reg. (page 31692). The relationship between hardness and toxicity is inversely proportional, that is, as the hardness increases, the toxicity is reduced. Therefore, the EPA's national recommended criteria for some metals (cadmium, chromium III, copper, lead, nickel, silver and zinc) are expressed as hardness based equations in order to most accurately reflect the site-specific toxicity of those metals.

As noted in letters[1] to the DWR, the EPA strongly supports the use of the nationally recommended hardness based equations for the derivation of criteria for hardness dependent metals. Using these equations should assure that the water quality standards are not *underprotective in low hardness waters* (setting criteria that are too high) or *overprotective in high hardness waters* (setting criteria that are too low). It is important that the correct hardness be used in those equations to ensure that the criteria are derived appropriately. This new section states in part that the hardness dependent standards shall be derived using the equations and that, "standards shall be calculated *based upon the actual instream hardness*." (Emphasis added). The EPA reads this section to state that the hardness to be used in the equation to derive the standard is based upon the actual instream hardness up to 400. This is consistent with the EPA's approach, where for instance, in the CTR, the EPA stated that the criteria should be calculated "using the actual ambient hardness of the surface water."

Low end Hardness Cap

This section also includes a provision that states "If the actual instream hardness (expressed as $CaCO_3$ or Ca+Mg) is less than 25 milligrams/liter (mg/l), standards shall be calculated based upon 25 mg/l hardness." This low end hardness "cap" for calculating criteria is not consistent with current EPA published recommendations. EPA published an update to the national recommended water quality criteria in 2002 that included the hardness dependent metals (EPA 2002). The EPA did not include a minimum hardness cutoff. Further, where the EPA has promulgated hardness based equations in the past such as in the CTR, a low end hardness cap was not included. In that rule, the EPA directly addressed this issue stating, "[I]n the past, EPA generally recommended that 25 mg/l as $CaCO_3$ be used as a default hardness value in deriving freshwater aquatic life criteria for metals when the ambient (or actual) hardness value is below 25 mg/l as $CaCO_3$. However, use of the approach results in criteria that may not be fully protective. Therefore, for waters with a hardness of less than 25 mg/l as $CaCO_3$, criteria should be calculated using the actual ambient hardness of the surface water."

North Carolina's 2015 adoption of a low end hardness cap is not consistent with EPA guidance, even with the State's application of a WER if deemed necessary for additional protection. The State did not provide adequate scientific justification to support its adoption of the cap as an alternative approach to EPA's recommendation. In its summary, the State cited EPA's 2002 Guidance stating toxicity data are somewhat limited below hardness of 25 mg/l, resulting in inconclusive data, and a hardness floor may not be fully protective. The EPA's Guidance states "Capping hardness at 25 mg/L without additional data or justification may result in criteria that provide less protection than that intended by EPA's Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses. Therefore, EPA now recommends that hardness not be capped at 25 mg/L, or any other hardness on the low end." North Carolina is concerned that use of actual ambient hardness in waters where hardness is below 25 mg/l may be overly protective. However, the State has not presented additional data or justification, demonstrating that designated uses would be protected if standards are calculated based upon 25 mg/l hardness in waters with a hardness less than 25 mg/L. Without such supporting justification, North Carolina's methodology for deriving a low end hardness cap is not scientifically defensible and the EPA cannot determine whether the cap would protect designated uses. The EPA concludes that the changes to subsection 15A NCAC 02B .0211(11)(c)(i) providing a low end hardness cap are not consistent with the CWA section 303(c) and 40 C.F.R. sections 131.6 and 131.11, and cannot be approved

[1] See Appendix B, EPA letters to DWR dated April 30, 2009, August 20, 2010, and January 3, 2014 and emails to DWR on August 22, 2014 and August 25, 2014.

as a protective water quality standard. Therefore, the EPA is disapproving the low end hardness cap changes under CWA section 303(c). The approved provision reads:

(11) Metals:

(d) Hardness-dependent freshwater metals standards shall be as follows:

(i) Hardness-dependent metals standards shall be derived using the equations specified in Table A: Dissolved Freshwater Standards for Hardness-Dependent Metals. If the actual instream hardness (expressed as $CaCO_3$ or Ca+Mg) is ~~less than 25 milligrams/liter (mg/l), standards shall be calculated based upon 25 mg/l hardness. If the actual instream hardness is greater than 25 mg/l and~~ less than 400 mg/l, standards shall be calculated based upon the actual instream hardness. If the instream hardness is greater than 400 mg/l, the maximum applicable hardness shall be 400 mg/l;

The EPA recommends that the State delete the low end hardness cap language to match the approved provision above during the next triennial review.

High End Hardness Cap

This section includes the provision, "*If the instream hardness is greater than 400 mg/l, the maximum applicable hardness shall be 400 mg/l*", which is consistent with published EPA recommendations that state, "[a]t high hardness there is an indication that hardness and related inorganic water quality characteristics do not have as much of an effect on toxicity of metals as they do at lower hardnesses. Related water quality characteristics do not correlate as well at high hardnesses." The EPA recommends that for hardness over 400 mg/l as $CaCO_3$ calculation of a criterion with a default WER of 1.0 should provide the protection intended in the 1985 Guidelines. See 57 Fed. Reg. (page 60,916). The EPA does note that "capping hardness at 400 mg/l might result in a level of protection that is higher than that intended by the 1985 guidelines, but any such increase in the level of protection can be overcome by use of the WER procedure." Id. As DWR is adding in the WER procedures in this rulemaking, the state will have the ability to ensure that the proper level of protection is ensured in waters with high hardness.

The EPA concludes that the changes to subsection 15A NCAC 02B .0211(11)(c)(i) providing a high end hardness cap are consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. Therefore, these changes are approved by the EPA under CWA section 303(c).

15A NCAC 02B .0211 Fresh Surface Water Quality Standards for Class C Waters Subparagraph (11)(c)(ii)

A new subsection 11(c)(ii) was added as follows:

(11) Metals:

(c)(ii) Hardness-dependent metals in NPDES permitting: for NPDES permitting purposes, application of the equations in Table A: Dissolved Freshwater Standards for Hardness-Dependent Metals shall have hardness values (expressed as $CaCO_3$ or Ca+Mg) established using the median of instream hardness data collected within the local US Geological Survey (USGS) and Natural Resources Conservation Service (NRCS) 8-digit Hydrologic Unit (HU). The minimum applicable instream hardness shall be 25 mg/l and the maximum applicable instream hardness shall be 400

mg/l, even when the actual median instream hardness is less than 25 mg/l and greater than 400 mg/l;

As stated above, the EPA approved for all purposes under the CWA the use of the actual instream hardness for calculating the appropriate water quality criteria when using the equations in Table A, except for hardness above 400 mg/l $CaCO_3$. The newly adopted provision in this subparagraph adds an alternate method for choosing the hardness value to be used when calculating permit limits for NPDES permits under Section 402 of the CWA.

The DWR stated that this section was adopted to ensure that a set value was used for deriving permit limits that did not vary from day-to-day. Use of the median of instream hardness data collected using the 8-digit Hydrologic Unit (HU) where a facility was located was intended to provide a uniform measurement of hardness both for deriving the permit limit and for determining compliance. The DWR was concerned that the use of the actual instream hardness could also be unduly influenced by effluent which could have higher hardness than the receiving waters, resulting in a metal criterion that would not be protective of downstream waters. North Carolina's evaluation also took into account elevated instream hardness from stormwater run-off in urban centers, which they state has been found to be inconsistent with "unimpacted upstream or downstream hardness values."

However, subpart 15A NCAC 02B .0211(11)(c)(ii), in effect, creates an alternate criteria for permitting purposes from 15A NCAC 02B .0211(11)(c)(i). The EPA regulations found at 40 C.F.R. 131.2 states that water quality standards define "the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses…and serve the purposes of the Clean Water Act." Those references goals include all section 101(a)(2) goals, such as ensuring that waters are fishable/swimmable. 40 C.F.R. 131.2 states that "[s]uch standards *serve the dual purposes* of establishing the water quality goals for a specific water body and serve as the regulatory basis for the establishment of water quality based treatment controls and strategies beyond the tech-based levels of treatment required by section 301(b) and 306 of the Act" (emphasis added). Section 15A NCAC O2B .0211(11)(c)(ii) results in alternative metals effluent limitations for purposes of permitting that are inconsistent with North Carolina's newly established metals criteria and are inconsistent with the water quality standards regulations.

North Carolina has discussed the challenges associated with determining the proper instream hardness values, but has not provided a scientifically defensible justification for the use of the median hardness. Use of the median, by definition, ensures that the hardness value is too high (not protective enough) for half of the facilities and too low (needlessly overprotective) for half the facilities. The size of the 8-digit HUs is such that it could cross ecoregions or subecoregions and include a wide range of hardness values, as demonstrated by the data provided by the State. The purpose of the hardness dependent criteria is to reflect conditions in waters at or near a facility and derive criteria that protect designated uses in those waters. North Carolina has not demonstrated that use of the median hardness will protect designated uses. The EPA NPDES permitting program will work with North Carolina to ensure that the hardness procedures used for implementation will address North Carolina's concerns. For instance, the EPA recommends that hardness samples be collected in the receiving stream upstream and away from the influence of the effluent as discussed in the CTR and those recommendations could be part of the implementation procedures for permitting. The EPA notes that typically these types of provisions are considered through NPDES permitting implementation procedures and should not be included as a WQS. The EPA concludes that the changes to subsection 15A NCAC 02B .0211(11)(c)(ii) are not protective of designated uses and, therefore, are not consistent with the CWA section 303(c) or 40 C.F.R. section 131.11. Therefore, these changes are not approved by the EPA under CWA section 303(c). The EPA

notes in disapproving this section that provisions for determining hardness to use in the hardness based equations shall be conducted using the approved provisions under 15A NCAC 02B .0211(11)(c)(i). The EPA recommends that the State delete the entire provision for median hardness in NPDES permitting during the next triennial review.

15A NCAC 02B .0211 Fresh Surface Water Quality Standards for Class C Waters Subparagraph (11)(d)

New subparagraph (11)(d) was added as follows to allow for the use of WERs for the metals listed in Table A:

> *(d) Alternatives:*
> *Acute and chronic freshwater aquatic life standards for metals listed in Table A apply to the dissolved form of the metal and apply as a function of the pollutant's water effect ratio (WER), which is set forth in Sub-Item (b). Alternative site-specific standards may also be developed as set forth in Sub-Item (b);*

As discussed in the review of the use of WERs under subparagraph .0211(11)(b), the use of WERs is consistent with the EPA's policy and guidance. The discussion in that section's review are incorporated into the review of this section by reference. For the same reasons set out in that section, the EPA concludes that the changes to subsection 15A NCAC 02B .0211(11)(d) to add in the use of a WER and to include a x1 multiplier in each of the criteria for the criteria in Table A is consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. Therefore, these changes are approved by the EPA under CWA section 303(c). The EPA strongly recommends that the first WERs developed by the State are reviewed in the study plan phase by the EPA to ensure that WERs that are developed meet the required procedures. The EPA looks forward to working with the State to ensure a quick review of the study plans.

15A NCAC 02B .0211 Fresh Surface Water Quality Standards for Class C Waters Table A under .0211(d)

A new table, Table A, was added to this section for new or revised criteria for hardness dependent metals:

> *Table A: Dissolved Freshwater Standards for Hardness-Dependent Metals*
> *Numeric standards calculated at 25 mg/l hardness are listed below for illustrative purposes. The Water Effects Ratio (WER) is equal to one unless determined otherwise under Sub-Item (d) of this rule.*

Metal	*Equations for Hardness-Dependent Freshwater Metals (ug/l)*	*Standard at 25 mg/l hardness*
Cadmium, Acute	*WER· [{1.136672-[ln hardness](0.041838)} · e^{0.9151 [ln hardness]-3.1485}]*	*0.82*
Cadmium, Acute, Trout waters	*WER· [{1.136672-[ln hardness](0.041838)} · e^{0.9151[ln hardness]-3.6236}]*	*0.51*
Cadmium, Chronic	*WER· [1.101672-[ln hardness](0.041838)} · e^{0.7998[ln hardness]-4.4451}]*	*0.15*
Chromium III, Acute	*WER· [0.316 · e^{0.8190[ln hardness]+3.7256}]*	*180*
Chromium III, Chronic	*WER· [0.860 · e^{0.8190[ln hardness]+0.6848}]*	*24*

Copper, Acute	*WER· [0.960 · e^{0.9422[ln hardness]-1.700}]* *Or,* *Aquatic Life Ambient Freshwater Quality Criteria—Copper 2007 Revision*	*3.6* *NA*
Copper, Chronic	*WER· [0.960 · e^{0.8545[ln hardness]-1.702}]* *Or,* *Aquatic Life Ambient Freshwater Quality Criteria—Copper 2007 Revision* *(EPA-822-R-07-001)*	*2.7* *NA*
Lead, Acute	*WER· [{1.46203-[ln hardness](0.145712)} · e^{1.273[ln hardness]-1.460}]*	*14*
Lead, Chronic	*WER· [{1.46203-[ln hardness](0.145712)} · e^{1.273[ln hardness]-4.705}]*	*0.54*
Nickel, Acute	*WER· [0.998 · e^{0.8460[ln hardness]+2.255}]*	*140*
Nickel, Chronic	*WER· [0.997 · e^{0.8460[ln hardness]+0.0584}]*	*16*
Silver, Acute	*WER· [0.85 · e^{1.72[ln hardness]-6.59}]*	*0.30*
Zinc, Acute	*WER· [0.978 · e^{0.8473[ln hardness]+0.884}]*	*36*
Zinc, Chronic	*WER· [0.986 · e^{0.8473[ln hardness]+0.884}]*	*36*

Note: For ease of review, this evaluation will be separated into two sections: Cadmium and other metals.

Hardness based equations for all metals except cadmium

The EPA commends the DWR for adopting the hardness based equations for metals to bring them in line with the EPA's national recommended criteria. Use of the equations, rather than the previously used default number at a set hardness, aligns North Carolina's criteria with the national recommended criteria. The equations were developed to most accurately identify the biologically available fraction available for uptake by organisms and therefore most likely to cause a toxic effect to aquatic life. With the exception of cadmium, discussed in more detail below, each of the hardness based equations in Table A is consistent with the national recommended equations and the values for the metal specific variables.

Freshwater Conversion Factors and Parameters for Calculating Freshwater Dissolved Metals Criteria that Are Hardness-Dependent

Chemical	mA	bA	mC	bC	Freshwater Conversion Factor: CMC	Freshwater Conversion Factor: CCC
Cadmium	1.0166	-3.924	0.7409	-4.719	1.136672-[(*ln*hardness)(0.041838)]	1.101672-[(*ln*hardness)(0.041838)]
Chromium III	0.8190	3.7256	0.8190	0.6848	0.316	0.860
Copper	0.9422	-1.700	0.8545	-1.702	0.960	0.960
Lead	1.273	-1.460	1.273	-4.705	1.46203-[(*ln*hardness)(0.145712)]	1.46203-[(*ln*hardness)(0.145712)]
Nickel	0.8460	2.255	0.8460	0.0584	0.998	0.997
Silver	1.72	-6.59	--	--	0.85	--
Zinc	0.8473	0.884	0.8473	0.884	0.978	0.986

Chromium III

Prior to these revisions, North Carolina did not have criteria for chromium III or chromium VI, instead having a single chronic value for total recoverable chromium of 50 ug/l. In this Rule, North Carolina is adopting the EPA's national recommended criteria for chromium III which are expressed as hardness based equations:

Acute: WER· [0.316 · e^{0.8190[ln hardness]+3.7256}] = 180 ug/l when calculated at 25 $CaCO_3$
Chronic: WER· [0.860 · e^{0.8190[ln hardness]+0.6848}] = 24 ug/l when calculated at 25 $CaCO_3$

Considering the scientific and technical information supporting the 304(a) recommendations, the EPA has determined that the changes to subsection 15A NCAC 02B .0211(11) Table A for acute and chronic chromium III criteria protect North Carolina's aquatic life use and, therefore, are consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. These changes are approved by the EPA under CWA section 303(c).

Copper

In this triennial, North Carolina has adopted in Table A the Aquatic Life Ambient Freshwater Quality Criteria—Copper 2007 Revision (EPA 2007) for calculating acute and chronic freshwater copper values using the Biotic Ligand Model (BLM). The BLM uses receiving water body characteristics to develop site-specific water quality criteria using the best available science to determine the bioavailability of copper. The BLM will require ten parameters to be put into the model, including temperature, pH, dissolved organic carbon, calcium, magnesium, sodium, potassium, sulfate, chloride, and alkalinity rather than just the hardness required for the hardness based equation.

North Carolina determined that the BLM was not often practical to implement when resources or data were not available for the collection or use of all ten parameters and therefore caveated the adoption to note that it will be used where sufficient data are available. On February 16, 2016, the EPA made available its Draft Technical Support Document: Recommended Estimates for Missing Water Quality Parameters for Application in EPA's Biotic Ligand Model (EPA 2016). The EPA recommends North Carolina review the document and consider its use when developing site-specific copper criteria.

When sufficient data are not available, North Carolina has chosen to use the EPA's previously published hardness based equation for copper in order to ensure state wide implementation of copper criteria. These EPA equations were derived in EPA's "National Recommended Water Quality Criteria – Correction" (EPA 1999). The DWR notes that this criteria document is a modification of previously published 304(a) aquatic life that was issued in the "1995 Updates: Water Quality Criteria Document for the Protection of Aquatic Life in Ambient Water" (EPA 1995) adopted and approved by all other Region 4 state water quality standards programs. North Carolina also notes that the EPA derived these equations using Great Lakes Initiative Guidelines 60 Fed. Reg. 15,393-15,399, (March 23, 1995); also found in 40 C.F.R. 132, Appendix A. Both the BLM and the hardness based equation were derived based on the principles in the 1985 Guidelines.

The hardness based equation is as follows:

Acute: WER· [0.960 · e^{0.9422[ln hardness]-1.700}] = 3.6 ug/l calculated at 25 mg/l $CaCO_3$
Chronic: WER· [0.960 · e^{0.8545[ln hardness]-1.702}] = 2.7 ug/l calculated at 25 mg/l $CaCO_3$

Considering the scientific and technical information supporting the 304(a) recommendations, the EPA has determined that the acute and chronic copper criteria in subsection 15A NCAC 02B .0211(11) Table A protect North Carolina's aquatic life use and, therefore, are consistent with section 303(c) of the CWA and 40 C.F.R. section 131.11(b)(1)(i). These changes are approved by the EPA under CWA section 303(c) for all purposes under the CWA.

Lead

The numeric criterion for lead was moved from 15A NCAC 02B .021(3)(l)(viii) to 15A NCAC 02B .0211(11)(d) Table A for alphabetizing purposes. The criteria for lead were also significantly revised from a total recoverable chronic value of 25 ug/l to the EPA's national recommended hardness based equations as follows:

Acute: WER· [{1.46203-[ln hardness](0.145712)} · e^{1.273[ln hardness]-1.460}] = 14 at 25 mg/l $CaCO_3$
Chronic: WER· [{1.46203-[ln hardness](0.145712)} · e^{1.273[ln hardness]-4.705}] = 0.54 at 25 mg/l $CaCO_3$

Considering the scientific and technical information supporting the 304(a) recommendations, the EPA has determined that the changes to subsection 15A NCAC 02B .0211(11) Table A for acute and chronic lead criteria protect North Carolina's aquatic life use and, therefore, are consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. These changes are approved by the EPA under CWA section 303(c).

Nickel

The numeric criterion for nickel was moved from 15A NCAC 02B .0211(3)(l)(x) to 15A NCAC 02B .0211(11)(d) Table A for alphabetizing purposes. The criteria for nickel were also revised from a total recoverable chronic value of 88 ug/l to the EPA's national recommended hardness based equations as follows:

Acute: WER· [0.998 · e^{0.8460[ln hardness]+2.255}] = 140 ug/l at 25 mg/l $CaCO_3$
Chronic: WER· [0.997 · e^{0.8460[ln hardness]+0.0584}] = 16 ug/l at 25 mg/l $CaCO_3$

Considering the scientific and technical information supporting the 304(a) recommendations, the EPA has determined that the changes to subsection 15A NCAC 02B .0211(11) Table A for acute and chronic nickel criteria protect North Carolina's aquatic life use and, therefore, are consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. These changes are approved by the EPA under CWA section 303(c).

Silver

In this revision, North Carolina is adding an acute criterion for silver that is derived based on the EPA's national recommended hardness based equation:

Acute: WER· [0.85 · e^{1.72[ln hardness]-6.59}] = 30 ug/l at 25 mg/l $CaCO_3$

Considering the scientific and technical information supporting the 304(a) recommendations, the EPA has determined that the change to subsection 15A NCAC 02B .0211(11) Table A for acute silver criteria

protects North Carolina's aquatic life use and, therefore, is consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. Therefore, this change is approved by the EPA under CWA section 303(c).

Zinc

North Carolina has revised its previous water quality standard for zinc from a chronic value of 50 ug/l to the dissolved acute and chronic values expressed by the EPA's national recommended hardness dependent equations:

Acute: WER· [0.978 · e^{0.8473[ln hardness]+0.884}] = 36 ug/l calculated at 25 mg/l $CaCO_3$
Chronic: WER· [0.978 · e^{0.8473[ln hardness]+0.884}] = 36 ug/l calculated at 25 mg/l $CaCO_3$

Considering the scientific and technical information supporting the 304(a) recommendations, the EPA has determined that the zinc criteria in subsection 15A NCAC 02B .0211(11) Table A protect North Carolina's aquatic life use and, therefore, are consistent with section 303(c) of the CWA and 40 C.F.R. section 131.11(b)(1)(i). These changes are approved by the EPA under section 303(c) for all purposes under the CWA.

Using the equations above for hardness dependent metals (other than cadmium), EPA compared North Carolina's new metals criteria to the EPA's recommended criteria, calculating all values for a default hardness of 25 mg $CaCO_3$ to facilitate comparison. Each individual criteria adopted by North Carolina is at least as stringent as the EPA's national recommendations.[2]

Comparison of Table A Hardness Dependent Metals with EPA's National Recommended Criteria			
Metal (all values are dissolved)	**NCDWR's Criteria calculated at a hardness of 25 (ug/l)**	**EPA's National Recommended criteria calculated at a hardness of 25 (ug/l)**	**EPA's Most Current Published Update**
Chromium III (acute)	180	183.07	EPA 1995
Chromium III (chronic)	24	23.81	EPA 1999
Copper (acute)	3.6	3.6	EPA 2007
Copper (chronic)	2.7	2.7	EPA 1999
Lead (acute)	14	13.88	EPA 1984
Lead (chronic)	0.54	0.54	
Nickel (acute)	140	144.92	EPA 1999
Nickel (chronic)	16	16	
Silver (acute)	0.30	0.3	EPA 1980
Zinc (acute)	36	36	EPA 1999
Zinc (chronic)	36	36	

[2] The slight differences in criteria levels shown in the chart is due to how the State and the EPA rounded results of calculations.

Hardness Based Equations for Cadmium

Prior to this revision, North Carolina had a chronic value of 0.4 ug/l for total cadmium in trout waters and 2.0 ug/l for total cadmium in non-trout waters found at 15A NCAC 02B .0211(3)(l)(iii). The revised water quality criteria for acute and chronic cadmium have been moved alphabetically into 15A NCAC 02B .0211 Table A. The new criteria are hardness based equations for the calculation of acute dissolved cadmium for non-trout and trout waters and a single chronic value for all waters.
The equations that North Carolina adopted did not use the variables that are recommended in the EPA's most recent recommendations resulting in criteria that differ from the national recommended criteria as indicated in the Table below.

Comparison of Table A Hardness Dependent Metals with EPA's National Recommended Criteria for Cadmium				
Metal (all values are dissolved)	**Previous NCDWR criteria**	**NCDWR's Criteria calculated at a hardness of 25 (ug/l)**	**EPA's National Recommended criteria calculated at a hardness of 25 (ug/l)**	**Most current EPA National Recommended Value**
Cadmium (acute)	--	**0.82**	0.52	EPA 2001
Cadmium (acute, trout waters)	--	0.51	0.52	
Cadmium (chronic)	0.4 ug/l trout waters 2.0 ug/l non-trout waters.	**0.15**	0.09	

The EPA's national recommended water quality criteria for cadmium were published in 2001 using the following equations:

$$\text{CMC (dissolved)} = (\text{CF})\ \exp\{\mathbf{m_A}\ [\ln(\text{hardness})] + \mathbf{b_A}\}$$
$$\text{CCC (dissolved)} = (\text{CF})\ \exp\{\mathbf{m_C}\ [\ln(\text{hardness})] + \mathbf{b_C}\}$$

The DWR modified those equations to use different variables from the recommended hardness criteria as shown in table below:

Hardness-based Equation Variable	$\mathbf{m_A}$ **(acute)**	$\mathbf{b_A}$ **(acute)**	$\mathbf{m_C}$ **(chronic)**	$\mathbf{b_C}$ **(chronic)**
EPA Recommended Variables for calculating cadmium criteria	1.0166	-3.924	0.7409	-4.719
Variables used by NC to calculate criteria	0.9151 (non-trout) 0.9151 (trout)	-3.1485 (non-trout) 3.6236 (trout)	0.7998	-4.4451

These modifications result in the following adopted equations for cadmium with the criteria shown calculated at 25 mg/l $CaCO_3$.

Acute: WER· [{1.136672-[ln hardness](0.041838)} · e^{0.9151 [ln hardness]-3.1485}] = 0.82
Acute (trout): WER· [{1.136672-[ln hardness](0.041838)} · e^{0.9151[ln hardness]-3.6236}] = 0.51
Chronic: WER· [1.101672-[ln hardness](0.041838)} · e^{0.7998[ln hardness]-4.4451}] = 0.15

North Carolina used the option under Section 131.11(b)(ii) that allows states to establish numerical standards by modifying Section 304(a) Guidance to reflect site-specific conditions. According to the DWR's justification, the State relied upon a study by Chadwick Ecological Consultants (CEC) that calculated alternative cold and warm water acute and chronic criteria for cadmium. Those values were adopted by the State of Colorado (effective date 1/1/2007) and approved by EPA Region 8. In Region 8's approval of those criteria, Region 8 stated:

> *EPA has reviewed the technical information supporting the revised table values. The Region notes that CEC applied the "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses" (EPA, 1985) in deriving the revised table values. The Region also notes that the differences between the CEC-derived table values and the CWA Section 304(a) criteria are partly attributable to CEC's use of a larger, more current database. Finally, the Region notes that the differences between the CEC-derived table values and the CWA Section 304(a) criteria are small relative to the uncertainties in both analyses. Accordingly, the Region has determined that: (I) the revised acute and chronic table value standards for cadmium were derived using scientifically-defensible methods, (2) the resulting table values generally are appropriate for the protection of Colorado's aquatic life classifications, and (3) the revisions are consistent with federal requirements at 40 C.F.R. 131.11. Accordingly, the revisions are approved today, subject to ESA consultation.*

Region 4 has determined that the CEC report relied on by the State represents the latest compilation of cadmium toxicity data available, consistent with Region 8's determination cited above. Region 4's findings are consistent with the scientific findings of Region 8 cited above and, additionally, Region 4 finds that the resulting values derived by North Carolina protect the State's aquatic life classifications. Region 4 concludes that the changes to subsection 15A NCAC 02B .0211(11)(d) to add the revised criteria in Table A for cadmium are consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. Therefore, these changes are approved by the EPA under CWA section 303(c) for all purposes under the Act.

15A NCAC 02B .0211(11)(e) Fresh Surface Water Quality Standards for Class C Waters

A new subsection regarding monitoring for metals was added as follows:

> *(11) Metals:*
>
> *(e) Compliance with acute instream metals standards shall only be evaluated using an average of two or more samples collected within one hour. Compliance with chronic instream metals standards shall only be evaluated using averages of a minimum of four samples taken on 5 consecutive days, or as a 96-hour average;*

After review of this new provision, the EPA has concluded that it is not a new or revised water quality standard and is therefore taking no action on this provision. This provision does not establish or change a level of protection related to the magnitude, duration, or frequency of water quality criteria nor establish designated uses or antidegradation requirements. Rather, this provision describes the sufficiency or reliability of information necessary for the State to decide whether a water attains or does not attain a water quality standard for purposes of establishing TMDLs under section 303(d)(1)(A) of the Act. As such, this provision is not a water quality standard but is a methodology under section 303(d) of the Act. See 40 C.F.R. § 130.7(b)(6). While this provision was not reviewed by EPA as a new or revised water quality standard, it may be considered by the EPA in reviewing lists of impaired waters submitted by the State under Section 303(d) of the CWA. The decision to not review this provision in no way confers agreement with the use of the provision for making attainment decisions.

15A NCAC 02B .0211 Fresh Surface Water Quality Standards for Class C Waters Subparagraph (11)(f)

A new subsection relating to biological confirmation for the assessment of metals was added as follows:

> *(f) Metals criteria shall be used for proactive environmental management. An instream exceedence of the numeric criterion for metals shall not be considered to have caused an adverse impact to the instream aquatic community without biological confirmation and a comparison of all available monitoring data and applicable water quality standards. This weight of evidence evaluation shall take into account data quality and the overall confidence in how representative the sampling is of conditions in the waterbody segment before an assessment of aquatic life use attainment, or non-attainment, shall be made by the Division. Recognizing the synergistic and antagonistic complexities of other water quality variables on the actual toxicity of metals, with the exception of mercury and selenium, biological monitoring will be used to validate, by direct measurement, whether or not the aquatic life use is supported:*

As the EPA has advised the DWR on multiple occasions, including directly addressing this provision in writing on multiple occasions, the EPA has a long history of not supporting biological confirmation for toxics assessment.[3] The EPA views biological criteria as one component of a comprehensive water quality standards program that works in concert with – *not in place of* – the use of water quality criteria for toxics as detailed further below.

North Carolina is adopting criteria for metals which will bring its water quality standards program in-line with other Region 4 states and EPA's national recommended criteria. These revisions are significant because chemical specific numeric criteria are a vital component of the CWA program for protection of the nation's waters for both assessment and permitting. The EPA has stated that "chemical specific assessments are ideal for predicting the likelihood of ecological impacts where they may not yet have occurred because…critical exposure conditions have not yet been experienced by the aquatic community." It further states that "Basing regulatory and management decisions on chemical assessment of water quality is an important and proven aspect of water quality assessment and protection" Water Quality Standards Regulation; Proposed Rule 63 Fed. Reg. (page 36,796) (July 7, 1998). Therefore, once

[3] See Appendix B, letters from the EPA to DWR dated August 10th, 2010, and January 3, 2014 and emails to DWR on August 22, 2014 and August 25, 2014.

criteria are established, assessment for purposes of listing under section 303(d) of the CWA and for permitting under the NPDES program must be based on all applicable water quality criteria.

In contrast, the EPA has stated that, "...while biological assessments can provide information in determining the cumulative effect of past or current impacts from multiple stressors, these assessments may be limited in their ability to predict, and therefore *prevent*, impacts" (emphasis added.) In fact, once biological impairment has been found, by definition, that impact was not prevented and costs for determining the cause and source and needed restoration can be prohibitive. 63 Fed. Register page 36,795.

The EPA has discussed how results of different tools should be reconciled should they indicate different outcomes, such as passing a biological assessment while exceeding a chemical criteria. "Where biological impact is not detected using biological assessment methods, it is possible that impairment that is projected and plausible, may simply have not yet occurred....EPA's view is that it would be inappropriate to ignore projected impairment simply because the impairment has not yet been observed in the environment" See 63 Fed. Reg. (page 36,801).

Section 101(a) of the CWA directly states the goal that the biological integrity of the Nation's waters be maintained, specifically stating the national policy that the discharge of toxic pollutants in toxic amounts be prohibited in order to maintain biological integrity. To meet that goal, 40 C.F.R. 131.11 provides that criteria for toxics be established at levels that protect designated uses, that is, at levels that *prevent* impairment of waters. It is not protective to defer action until biological impairment has already occurred.

Furthermore, the EPA notes that DWR has adopted as part of this triennial review the use of the dissolved fraction of the toxics criteria, the hardness based equation for the hardness dependent metals and the BLM for copper criteria. Each of these provisions were done to more accurately derive and use criteria that are reflective of the biologically available fraction of the metals.

Finally, the US Fish and Wildlife Service (FWS) commented[4] on this provision during the public comment period. In addition to all of the EPA's stated objections, the FWS pointed out an additional flaw in this provision – the biological monitoring conducted by DWR does not include testing for those species that are most sensitive to toxic effects, including mussels, cladocerons and snails. Therefore North Carolina's biological monitoring is not representative of the impacts to all species that may be the most sensitive to the toxics subject to the new metals criteria adopted by the State during this triennial review.

The EPA has determined that the changes to subsection 15A NCAC 02B .0211(11)(f) do not protect North Carolina's aquatic life use and, therefore, are not consistent with the CWA section 303(c) or its implementing regulations found at 40 C.F.R. section 131.11. Therefore, these changes are disapproved by the EPA under CWA section 303(c). With today's disapproval of this section, the new water quality criteria for metals as approved shall be used for all purposes under the Act, including for purposes of monitoring and assessment. The EPA recommends that the State delete the entire biological confirmation provision during the next triennial review.

[4] See Appendix C. letters from the US FWS to NC DENR dated, January 3, 2014, and August 22, 2014.

15A NCAC 02B .0211 Fresh Surface Water Quality Standards for Class C Waters
Subparagraph 13 - 20

The following parameters were moved in order to alphabetize the state water quality criteria:

(13) Pesticides:
- *(a) Aldrin: 0.002 ug/l;*
- *(b) Chlordane: 0.004 ug/l;*
- *(c) DDT: 0.001 ug/l;*
- *(d) Demeton: 0.1 ug/l;*
- *(e) Dieldrin: 0.002 ug/l;*
- *(f) Endosulfan: 0.05 ug/l;*
- *(g) Endrin: 0.002 ug/l;*
- *(h) Guthion: 0.01 ug/l;*
- *(i) Heptachlor: 0.004 ug/l;*
- *(j) Lindane: 0.01 ug/l;*
- *(k) Methoxychlor: 0.03 ug/l;*
- *(l) Mirex: 0.001 ug/l;*
- *(m) Parathion: 0.013 [~~ug/l;~~] ug/l; and*
- *(n) Toxaphene: 0.0002 ug/l;*

~~(g)~~(14) pH: shall be normal for the waters in the area, which ~~generally shall~~ range between 6.0 and 9.0 except that swamp waters may have a pH as low as 4.3 if it is the result of natural conditions;

~~(h)~~(15) Phenolic compounds: only such levels as shall not result in fishflesh- tainting or impairment of other best usage;

(16) Polychlorinated biphenyls (total of all PCBs and congeners identified): 0.001 ug/l;

~~(i)~~(17) Radioactive substances:
- *~~(i)~~(a) Combined radium-226 and radium-228: the ~~maximum~~ average annual activity level (based on at least one sample collected per quarter)~~four samples collected quarterly)~~ for combined radium226 and radium228 shall not exceed five -picoCuries- per liter;*
- *~~(ii)~~(b) Alpha Emitters: the average annual gross alpha particle activity (including radium226, but excluding radon and uranium) shall not exceed 15 picoCuries- per liter;*
- *~~(iii)~~(c) Beta Emitters: the ~~maximum~~ average annual activity level (based on at least one sample collected per quarter) ~~four samples, collected quarterly)~~ for strontium90 shall not exceed eight picoCuries- per liter; nor shall the average annual gross beta particle activity (excluding potassium-40 and other naturally occurring ~~radio-nuclides)~~ radionuclides) exceed 50 picoCuries per liter; nor shall the ~~maximum~~ average annual activity level for tritium exceed 20,000 picoCuries per liter;*

~~(j)~~(18) Temperature: not to exceed 2.8 degrees C (5.04 degrees F) above the natural water temperature, and in no case to exceed 29 degrees C (84.2 degrees F) for mountain and upper piedmont waters and 32 degrees C (89.6 degrees F) for lower piedmont and coastal plain Waters; the temperature for trout waters shall not be increased by more than 0.5 degrees C (0.9 degrees F) due to the discharge of heated liquids, but in no case to exceed 20 degrees C (68 degrees F);

(19) Toluene: 11 ug/l or 0.36 ug/l in trout classified waters;

(20) Trialkyltin compounds: 0.07 ug/l expressed as tributyltin;

~~(k)~~(21) *Turbidity: the turbidity in the receiving water shall not exceed 50 Nephelometric Turbidity Units (NTU) in streams not designated as trout waters and 10 NTU in streams, ~~lakes~~ lakes, or reservoirs designated as trout waters; for lakes and reservoirs not designated as trout waters, the turbidity shall not exceed 25 NTU; if turbidity exceeds these levels due to natural background conditions, the existing turbidity level shall not be increased. Compliance with this turbidity standard can be met when land management activities employ Best Management Practices (BMPs) [as defined by Rule .0202 of this Section] recommended by the Designated Nonpoint Source Agency [as defined by Rule .0202 of this Section]. BMPs ~~must~~ shall be in full compliance with all specifications governing the proper design, installation, ~~operation~~ operation, and maintenance of such BMPs;*

The EPA has reviewed the revision and since the numeric values of the above listed criteria did not change, they are non-substantive. Therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

15A NCAC 02B .0211 Fresh Surface Water Quality Standards for Class C Waters
Subparagraph (l)

The following language was removed from previously existing 15A NCAC 02B .0211(3)(l) where it had served as the introductory language to all metals criteria as well as criteria for other toxics (chlorine, cyanide flourides, pesticides, polychlorinated biphenyls, toluene and trialkyltin compounds). After alphabetizing the criteria, the metals and toxics criteria are no longer together in one section, therefore, the State removed the following introductory language.

~~*(l) Toxic substances: numerical water quality standards (maximum permissible levels) for the protection of human health applicable to all fresh surface waters are in Rule .0208 of this Section. Numerical water quality standards (maximum permissible levels) to protect aquatic life applicable to all fresh surface waters:*~~

The "General" paragraph listed at the beginning of 15A NCAC 02B .0211 now serves as the introductory paragraph to this section which applies to all metals and toxics criteria. The "General" paragraph states that the WQS "…for all fresh surface waters are the basic standards applicable to Class C waters." 15A NCAC 02B .0101 General Procedures provides a definition for Class C waters which includes that Class C waters are "*freshwaters protected for secondary recreation, fishing, aquatic life including propagation and survival, and wildlife. All freshwaters shall be classified to protect these uses at a minimum.*" EPA has reviewed this change and determined that it is non-substantive. The EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

The following sections were removed from this subparagraph as follows:

~~*(i) Arsenic: 50 ug/l;*~~
~~*(ii) Beryllium: 6.5 ug/l;*~~
~~*(iii) Cadmium: 0.4 ug/l for trout waters and 2.0 ug/l for nontrout waters; attainment of these water quality standards in surface waters shall be based on measurement of total recoverable metals concentrations unless appropriate studies have been conducted to translate total recoverable*~~

~~metals to a toxic form. Studies used to determine the toxic form or translators must be designed according to the "Water Quality Standards Handbook Second Edition" published by the Environmental Protection Agency (EPA 823-B-94-005a) or "The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit From a Dissolved Criterion" published by the Environmental Protection Agency (EPA 823-B-96-007) which are hereby incorporated by reference including any subsequent amendments. The Director shall consider conformance to EPA guidance as well as the presence of environmental conditions that limit the applicability of translators in approving the use of metal translators;~~

~~(iv) Chlorine, total residual: 17 ug/l;~~

~~(v) Chromium, total recoverable: 50 ug/l;~~

~~(vi) Cyanide, 5.0 ug/l, unless site-specific criteria are developed based upon the aquatic life at the site utilizing The Recalculation Procedure in Appendix B of Appendix L in the Environmental Protection Agency's Water Quality Standards Handbook hereby incorporated by reference including any subsequent amendments;~~

~~(vii) Fluorides: 1.8 mg/l;~~

~~(viii) Lead, total recoverable: 25 ug/l, collection of data on sources, transport and fate of lead shall be required as part of the toxicity reduction evaluation for dischargers who are out of compliance with whole effluent toxicity testing requirements and the concentration of lead in the effluent is concomitantly determined to exceed an instream level of 3.1 ug/l from the discharge;~~

~~(ix) Mercury: 0.012 ug/l;~~

~~(x) Nickel: 88 ug/l, attainment of these water quality standards in surface waters shall be based on measurement of total recoverable metals concentrations unless appropriate studies have been conducted to translate total recoverable metals to a toxic form. Studies used to determine the toxic form or translators must be designed according to the "Water Quality Standards Handbook Second Edition" published by the Environmental Protection Agency (EPA 823-B-94-005a) or "The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit From a Dissolved Criterion" published by the Environmental Protection Agency (EPA 823-B-96-007) which are hereby incorporated by reference including any subsequent amendments. The Director shall consider conformance to EPA guidance as well as the presence of environmental conditions that limit the applicability of translators in approving the use of metal translators;~~

~~(xi) Pesticides:~~

~~(A) Aldrin: 0.002 ug/l;~~

~~(B) Chlordane: 0.004 ug/l;~~

~~(C) DDT: 0.001 ug/l;~~

~~(D) Demeton: 0.1 ug/l;~~

~~(E) Dieldrin: 0.002 ug/l;~~

~~(F) Endosulfan: 0.05 ug/l;~~

~~(G) Endrin: 0.002 ug/l;~~

~~(H) Guthion: 0.01 ug/l;~~

~~(I) Heptachlor: 0.004 ug/l;~~

~~(J) Lindane: 0.01 ug/l;~~

~~(K) Methoxychlor: 0.03 ug/l;~~

~~(L) Mirex: 0.001 ug/l;~~
~~(M) Parathion: 0.013 ug/l;~~
~~(N) Toxaphene: 0.0002 ug/l;~~
~~(xii) Polychlorinated biphenyls: (total of all PCBs and congeners identified) 0.001 ug/l;~~
~~(xiii) Selenium: 5 ug/l;~~
~~(xiv) Toluene: 11 ug/l or 0.36 ug/l in trout waters;~~
~~(xv) Trialkyltin compounds: 0.07 ug/l expressed as tributyltin;~~

The struck provisions for arsenic, beryllium, cadmium, chromium, lead and nickel have been replaced by new criteria as noted above. The remaining numeric values in this section were moved to other sections as previously noted. As the criteria are not changed, the EPA determined that these changes are non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

15A NCAC 02B .0211(22) Fresh Surface Water Quality Standards for Class C Waters

North Carolina has had a provision in place to allow the use of action levels for copper, iron, silver, zinc and chloride rather than using water quality criteria for all purposes under the CWA. Under North Carolina's WQS, action levels are numerical water quality standards except for NPDES permitting. For NPDES permitting purposes, a facility would need reasonable potential to exceed a water quality criteria (or in this case, the action level), and must fail a Whole Effluent Toxicity (WET) test prior to receiving a limit in its NPDES permit. If a facility had reasonable potential for a parameter, such as copper or zinc, but passed a WET test, the facility would not be required to limit or control the parameter in its permit. Therefore, a facility may cause or contribute to an exceedance of an action level parameter and pass a WET test thereby not controlling for the action level parameters in its permit.

A subsection relating to action levels was revised to change the values for copper, silver and zinc, remove iron and remove the language that states that action levels are considered water quality standards. Each of the revisions are addressed individually below:

~~(1)~~(22) Action Levels for Toxic ~~Substances:~~ Substances Applicable to NPDES Permits:
(a) ~~Copper: 7 ug/l;~~Copper, dissolved, chronic: 2.7 ug/l;
~~(b) Iron: 1.0 mg/l;~~
(c) ~~Silver:~~Silver, dissolved, chronic: 0.06 ug/l;
(d) ~~Zinc:~~Zinc, dissolved, chronic: ~~50 ug/l;~~36 [~~ug/l;~~] ug/l; and
(e) Chloride: 230 mg/l;
The hardness-dependent freshwater action levels for ~~Copper and Zinc,~~ copper and zinc, provided here for illustrative purposes, corresponds to a hardness of 25 mg/l. Copper and [~~Zinc~~] zinc action level values for other instream hardness values shall be calculated per the chronic equations specified in Item (11) of this Rule and in Table A: Dissolved Freshwater Standards for Hardness-Dependent Metals. If the ~~Action Levels~~ action levels for any of the substances listed in this ~~Subparagraph~~Item (which are generally not bioaccumulative and have variable toxicity to aquatic life because of chemical form, solubility, stream characteristics or associated waste characteristics) are determined by the waste load allocation to be exceeded in a receiving water by a discharge under the specified ~~low flow~~ 7Q10 criterion for toxic ~~substances (Rule .0206 in this Section),~~ substances, the discharger shall monitor the chemical or biological effects of the discharge; efforts shall be

made by all dischargers to reduce or eliminate these substances from their effluents. Those substances for which ~~Action Levels~~ action levels are listed in this ~~Subparagraph~~Item shall be limited as appropriate in the NPDES permit ~~based on the Action Levels listed in this Subparagraph~~ if sufficient information (to be determined for metals by measurements of that portion of the dissolved instream concentration of the ~~Action Levels~~ action levels parameter attributable to a specific NPDES permitted discharge) exists to indicate that any of those substances may be a causative factor resulting in toxicity of the effluent. ~~NPDES permit limits may be based on translation of the toxic form to total recoverable metals. Studies used to determine the toxic form or translators must be designed according to "Water Quality Standards Handbook Second Edition" published by the Environmental Protection Agency (EPA 823-B-94-005a) or "The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit From a Dissolved Criterion" published by the Environmental Protection Agency (EPA 823-B-96-007) which are hereby incorporated by reference including any subsequent amendments. The Director shall consider conformance to EPA guidance as well as the presence of environmental conditions that limit the applicability of translators in approving the use of metal translators.~~

~~For purposes other than consideration of NPDES permitting of point source discharges as described in this Subparagraph, the Action Levels in this Rule, as measured by an appropriate analytical technique, per 15A NCAC 02B .0103(a), shall be considered as numerical instream water quality standards.~~

Removal of the Action Level for Iron

North Carolina has removed the action level for iron and has not replaced that value with a new or revised numeric water quality criterion. DWR proposed this revision and worked with the EPA in the scientific review and development of a justification that demonstrates that iron occurs at naturally high levels in some areas of the state, often above the value of 1 mg/l that is being removed. The EPA Region 4 conducted an independent evaluation of the State's findings and supports the removal of the iron criterion because iron occurs at naturally high levels. DWR has agreed that in order to protect the designated use for any potential impairment determined to be caused by iron (for instance, from mining operations or increased iron in the tailwaters below dams), the State will rely upon the existing narrative WQS at 15A NCAC .0211(12), "[o]ils, deleterious substances, colored, or other wastes: only such amounts as shall not render the waters injurious to public health, secondary recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated uses."

The EPA has determined that the change to subsection 15A NCAC 02B .0211(22) to remove the iron criterion protects North Carolina's aquatic life use and, therefore, is consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. The change is approved by the EPA under CWA section 303(c) for all purposes under the Act.

Revision to Copper, Silver and Zinc as an Action Level

As the EPA has advised the DWR on multiple occasions, the EPA does not support North Carolina's continued use of action levels, and directly addressed this provision in multiple letters to DWR.[5] The EPA reiterates its previous comments. The EPA's section 304(a) criteria were developed to take into account site specific factors such as solubility and chemical form in determining the biologically available fraction

[5] See Appendix B. EPA letters to DWR dated April 30, 2009, August 20, 2010, and January 3, 2014 and emails to DWR on August 22, 2014 and August 25, 2014.

available for uptake by biological organisms and, therefore, the fraction most likely to cause a toxic effect. The use of the dissolved fraction and the use of the hardness-based equations for hardness dependent metals, such as copper and zinc, further addressed variability caused by stream characteristics. Hardness is used as a surrogate for a number of water quality characteristics, which affect the toxicity of metals in a variety of ways. See 65 Fed. Reg. (page 31,692). North Carolina's adoption of the hardness dependent equations negates the need for the continued use of action levels as the criteria equations address issues related to protection of downstream waters and brings North Carolina in-line with the criteria used in surrounding states. This is particularly true as North Carolina is adopting the procedures for the use of the Biotic Ligand Model for copper as well as including a reference for EPA approved site-specific criteria development, such as WERs, under 15A NCAC 02B .0211(11)(b).

North Carolina's action level requirements, set forth above, provide that NPDES limits shall be set for metals if information exists to indicate that a particular substance may be a *causative* factor resulting in the toxicity of the effluent. 40 C.F.R. 122.44(d)(1)(i) states that limits must be put in place to control pollutants which may be discharged at a level "which will cause, have the reasonable potential to cause or contribute to an excursion above any State water quality standard." This regulation does not indicate that the effluent must be the sole cause of toxicity before the parameter should be limited. The provision states that the pollutant should be limited under NPDES if it could cause or if it could *contribute* to a water quality standards excursion. This requirement is significant because there may often be multiple sources of pollutants in receiving waters, from non-point source run-off, from point sources and from storm water. No one facility or source may be the sole cause of the impairment, but rather multiple discharges contribute to the toxicity and excursion of water quality standards. That is, a facility could contribute to an impairment while also passing a WET test. Therefore, when a point source discharges zinc levels with a reasonable potential to cause or contribute to exceedance of the State's zinc criteria, the permit must include effluent limitations as stringent as necessary to achieve the WQS.

The Region recognizes that North Carolina has a strong WET testing program. WET testing can be "effective for controlling discharges containing multiple pollutants. It can also provide a method for addressing synergistic and antagonistic effects on aquatic life" from multiple pollutants. See 63 Fed. Reg. (page 36,768). However, where criteria exist to directly control toxic pollutants, those criteria should be used to limit the discharge of pollutants. WET should be used to address those instances where criteria may not be available to limit toxicity. The EPA has explained that states can reconcile biological data, such as WET, with 'reasonable potential' analysis and concludes "EPA would not support a radical shift away from chemical criteria and limits or toxicity criteria and limits. Those tools are simply too important as proven tools for assessing potential impact to surface waters and improving water quality." See 63 Fed. Reg. (page 36,802). If needed, an effort should be made to refine the applicable criteria, through WERs and other tools, to ensure that appropriate criteria be developed for each facility. It is not protective, however, and is not consistent with EPA's permitting regulations, to defer permit limitations once there is reasonable potential to exceed a water quality criteria.

The State now has approved copper, silver and zinc criteria applicable for all purposes under the CWA in 15A NCAC 02B .0211(11) in place of the action levels, which were applicable only for NPDES permitting. The EPA concludes that the changes to subsection 15A NCAC 02B .0211(22) do not protect North Carolina's aquatic life use and, therefore, are not consistent with the CWA section 303(c) or its implementing regulations found at 40 C.F.R. section 131.11. The changes to (22)(a), (c), and (d) and the added language to the narrative following (22)(e) are disapproved by the EPA under CWA section 303(c). The deletions of the narrative language below (22)(e) at the end of the provision are approved by the EPA under CWA section 303(c) as consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. The EPA notes in disapproving this section that no new standards are required to be promulgated in its place

and the new water quality criteria for metals as approved in 15A NCAC 02B .0211(11) shall be used for all purposes under the Act.

The EPA's disapproval of the revisions to the action level provision means that the previously approved action levels are applicable WQS under the CWA, per the Alaska Rule.[6] However, the State's newly adopted and approved metals criteria are also applicable WQS under the CWA and, therefore, must also be implemented in all CWA programs, including the NPDES permitting program. The EPA's permitting regulations at 40 C.F.R. 122.44(d)(1)(vii)(A) require that effluent limitations be derived from and comply with all applicable water quality standards. Where the State has two applicable water quality standards addressing the same or similar parameters, permit limitations based on those WQS must protect the more stringent criteria. Based on EPA's understanding of the permitting provisions in North Carolina's action level section, effluent limitations derived to comply with the new metals criteria in 15A NCAC 02B .0211(11) will likely be more stringent than limitations derived to comply with the action level provision. The EPA recommends that the State delete the entire action level section during the next triennial review.

Action Level for Chloride

Chloride remains the only parameter in the action levels provision for which there is not an associated criterion in Table A or elsewhere in the State water quality standards. Prior to this revision, the following language applied to the action levels,

> "*For purposes other than consideration of NPDES permitting of point source discharges as described in this Subparagraph, the Action Levels in this Rule, as measured by an appropriate analytical technique, per 15A NCAC 02B .0103(a), shall be considered as numerical instream water quality standards.*"

This language, which was removed from the revised action level provision, was previously added by the State to clarify that the State intended the action level values to be standards for all other CWA purposes besides permitting. In this triennial review, the State adopted numeric water quality criteria for all purposes under the CWA, as water quality standards. The adoption of numeric criteria for all other action level parameters clarifies their use as WQS. The numeric value for chloride still remains and the EPA anticipates that the State will continue using the chloride action level as a WQS for all other purposes under the CWA. The EPA's position is that the chloride action level is still a WQS for all other purposes than permitting even with the sentence above deleted. The EPA notes that with this section 303(c) decision, the only remaining action level is chloride. Therefore, the EPA strongly recommends that North Carolina adopt chloride as a numeric water quality criterion for all purposes under the CWA and remove the Action Level section from the water quality standards.

[6] The Alaska Rule states that water quality standards adopted by states and authorized tribes on or after May 30, 2000 must be approved by the EPA before they can be used as the basis for actions, such as establishing water quality-based effluent limitations or TMDLs, under the CWA.

15A NCAC 02B .0212 Fresh Surface Water Quality Standards for Class WS-I Waters
15A NCAC 02B .0214 Fresh Surface Water Quality Standards for Class WS-II Waters
15A NCAC 02B .0215 Fresh Surface Water Quality Standards for Class WS-III Waters
15A NCAC 02B .0216 Fresh Surface Water Quality Standards for Class WS-IV Waters
15A NCAC 02B .0218 Fresh Surface Water Quality Standards for Class WS-V Waters

Section (h) of each of the five WS designated use classifications was revised as follows:

(h) Toxic and other deleterious substances:
(i) Water quality standards (maximum permissible concentrations) to protect human health through water consumption and fish tissue consumption for noncarcinogens- in Class WS-V waters:
(A) Barium: 1.0 mg/l;
(B) Chloride: 250 mg/l;
~~(C) Manganese: 200 ug/l;~~
~~(D)~~(C) Nickel: 25 ug/l;
~~(E)~~(D) Nitrate nitrogen: 10 mg/l;
~~(F)~~(E) 2,4-D: ~~100 ug/l;~~70 ug/l;

Manganese

The DWR conducted a review of the effects of manganese on human health and taste and odor (organoleptic effects) in WS waters. As part of that evaluation, the State reviewed stream and groundwater data on how often manganese occurs in State waters. The DWR initiated this review because the State's monitoring data often showed levels of manganese that were higher than the State's criterion of 200 ug/l. The results of the review found studies that show high concentrations of naturally occurring manganese in both state surface water and groundwater. For example, a United States Geological Survey (USGS 1992) study indicated concentrations of manganese ranged from "less than 10 to 380 ug/l…" and that "…many mean concentrations of total manganese in stream water exceeded recommended limits…" A second USGS paper found a range of 30-640 ug/l manganese in the French Broad River and noted that the "geology of the region is the primary cause for these high…manganese concentrations." (USGS 1982)

In considering whether or not to remove the ambient water quality criterion for manganese from WS waters, the State reviewed the EPA recommendations both under the CWA and the Safe Drinking Water Act (SDWA). The EPA's currently recommended criterion for manganese under the CWA in freshwater is 50 ug/L. This value is not based on toxic effects, but rather is intended to minimize objectionable quality such as laundry stains and objectionable tastes in beverages (EPA 1986a). North Carolina's WS designated waters are considered safe for drinking, culinary, and food-processing purposes "following treatment required by the Division of Environmental Health" and "shall meet the Maximum Contaminant Level concentrations…which are specified in the national drinking water regulations and in the North Carolina Rules Governing Public Water Supplies, 15A NCAC 18C .1500." There is currently no recommended Maximum Contaminant Level (MCL) for manganese in treated drinking water under the SDWA, however, there is a Secondary MCL of 50 ug/L, established as a guideline for public water systems in managing drinking water systems for taste and odor. The DWR's review concluded that the Secondary MCL, "could be used by water suppliers, if ever warranted, to protect users from objectionable taste and/or staining of laundry." The EPA notes that a health advisory was published for manganese in drinking water of 50 mg/L, as well, which should also be evaluated by North Carolina (EPA 2004). The EPA has noted that it may update the currently recommended ambient water quality criterion for

freshwater manganese at some time in the future. NC has stated that they will review and consider the new recommendations once published.

After reviewing the EPA's recommendations under the CWA and the SDWA and its own data on manganese, the State concluded that there was "no evidence to conclude that discharges of manganese will impact any designed uses of NC's waters." In addition, the DWR has indicated that existing narrative criteria will be used to protect water supplies from any deleterious effects from manganese. The applicable criterion at 15A NCAC 02B .0211(12) states,

> "Oils, deleterious substances, colored, or other wastes: only such amounts as shall not render the waters injurious to public health, secondary recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality or impair the water for any designated uses…"

The EPA has determined that North Carolina's WS uses will continue to be protected considering the changes to subsection 15A NCAC 02B .0212(h), 15A NCAC 02B .0214(h), 15A NCAC 02B .0215(h), 15A NCAC 02B .0216(h) and 15A NCAC 02B .0218(h) to remove the numeric criteria for manganese, since the State has committed to use the narrative criterion at 15A NCAC 02B .0211(12) as needed to address deleterious impacts of manganese. Therefore, these changes are consistent with the CWA section 303(c) and the implementing regulations at 40 C.F.R. section 131.11 and are approved by the EPA under CWA section 303(c).

2, 4 Dichlorophenoxyacetic acid (2, 4 D)

The DWR revised its 2, 4 D criterion for WS uses to update it with the most recently published reference dose information from the EPA's Integrated Risk Information System. This resulted in a revision of the criterion from 100 ug/l to 70 ug/l.

Considering the scientific and technical information supporting the 304(a) recommendations, the EPA has determined that the changes to subsection 15A NCAC 02B .0212(h), 15A NCAC 02B .0214(h), 15A NCAC 02B .0215(h), 15A NCAC 02B .0216(h) and 15A NCAC 02B .0218(h) to update the criterion for 2, 4 D will protect North Carolina's WS uses and, therefore, are consistent with the CWA section 303(c) and the implementing regulations at 40 C.F.R. section 131.11. These changes are approved by the EPA under CWA section 303(c).

Many portions of this section were also modified for clarification, grammar, and reorganization. The EPA has reviewed these revisions and determined that they are non-substantive and, therefore, the EPA approves the revisions as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of these non-substantive changes does not re-open the EPA's prior approval of the underlying substantive WQSs.

15A NCAC 02B .0220 Tidal Salt Water Quality Standards for Class SC Waters
General paragraph and Subparagraphs (1) through (6)

The following revisions were made to the General opening paragraph and Sections (1) through (9) of *Section 15A NCAC 02B .0220.*

> *General. The water quality standards for all tidal salt waters shall be the basic standards applicable to Class SC waters. Additional and more stringent standards applicable to other specific tidal salt water classifications are specified in Rules .0221 and .0222 of this Section.*

Action Levels, for purposes of National Pollutant Discharge Elimination System (NPDES) permitting, are specified in Item (20) of this Rule.

The new sentence added as the final sentence to the general paragraph references the use of action levels. The EPA has reviewed this change and determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs. For the substantive discussion of the EPA's decision regarding revisions to action levels in tidal salt waters, see page 42.

The following subparagraphs were renumbered for alphanumeric reordering only:

(3) Chlorophyll a
(5) Dissolved oxygen
(7) Floating solids, settleable solids or sludge deposits
(8) Gases, total dissolved
(12) pH
(13) Phenolic compounds
(15) Radioactive substances
(16) Salinity
(17) Temperature

The EPA has reviewed these changes and determined that they are non-substantive and therefore, the EPA approves these revisions as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that this approval of these non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

The following sentence came before all of the criteria in the old format prior to the alphabetical reorganization of the WQS.

~~*(3) Quality standards applicable to all tidal salt waters:*~~

The State indicated that this sentence was found to be redundant with the information in the General paragraph of this rule. The General paragraph listed just above this states that "*The water quality standards for all tidal salt waters shall be the basic standards applicable to Class SC waters.*" 15A NCAC 02B .0101 General Procedures provides a definition for Class SC waters which includes that "*Class SC: saltwaters protected for secondary recreation, fishing, aquatic life including propagation and survival, and wildlife. All saltwaters shall be classified to protect these uses at a minimum.*" The removal of this sentence does not change or revise the state WQS. The EPA has reviewed this change and determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

New subparagraph (4) was created:

(4) Cyanide: 1 ug/l;

The new paragraph moves cyanide from its previous location at Rule .0220(m)(iv) and retains the same numeric value. Therefore, this revision is a non-substantive change to WQSs and the EPA approves the

revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

New subparagraph (6) was created to move the bacteria criteria into alphabetical order. This section also includes the strike-out as noted below. The state indicated that this language was found to be redundant and not needed. The EPA concurs that all provisions in these Rules are in accordance with the Federal Water Pollution Control Act and that the specific reference in this paragraph is not a substantive change to the criteria. The EPA has reviewed this change and determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

> *(6) Enterococcus, including Enterococcus faecalis, Enterococcus faecium, Enterococcus avium and Enterococcus gallinarium: not to exceed a geometric mean of 35 enterococci per 100 ml based upon a minimum of five samples within any consecutive 30 days. [~~In accordance with 33 U.S.C. 1313 (Federal Water Pollution Control Act) for~~]For purposes of beach monitoring and notification, "Coastal Recreational Waters Monitoring, Evaluation and Notification" regulations (15A NCAC 18A .3400), available free of charge at: http://www.ncoah.com/ , are hereby incorporated by reference including any subsequent amendments;*
>
> ~~*(e) Enterococcus, including Enterococcus faecalis, Enterococcus faecium, Enterococcus avium and Enterococcus gallinarium: not to exceed a geometric mean of 35 enterococci per 100 ml based upon a minimum of five samples within any consecutive 30 days. In accordance with 33 U.S.C. 1313 (Federal Water Pollution Control Act) for purposes of beach monitoring and notification, "Coastal Recreational Waters Monitoring, Evaluation and Notification" regulations (15A NCAC 18A .3400) are hereby incorporated by reference including any subsequent amendments;*~~

15A NCAC 02B .0220 Tidal Salt Water Quality Standards for Class SC Waters Subparagraphs (9)

> *(9) Metals:*
>
> *(a) With the exception of mercury and selenium, tidal salt water quality standards for metals shall be based upon measurement of the dissolved fraction of the metals. Mercury and selenium shall be based upon measurement of the total recoverable metal;*

The EPA's most current national recommended water quality criteria for protection of aquatic life includes the recommendation that fresh and salt water criteria for metals (including specifically arsenic, cadmium, chromium III, chromium VI, copper, lead, nickel, silver and zinc) be expressed in terms of the dissolved metal in the water column. In 1993, the EPA provided additional guidance on the use of the dissolved fraction of metals stating that, "[t]he use of dissolved metal to set and measure compliance with water quality standards is the recommended approach, because dissolved metal more closely approximates the bioavailable fraction of metal in the water column than does total recoverable metal" (EPA 1993).

Considering the scientific and technical information supporting the 304(a) recommendations, the EPA has determined that this change to subsection 15A NCAC 02B .0220(9)(a) protects North Carolina's aquatic

life use and, therefore, is consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. This change is approved by the EPA under CWA section 303(c).

The DWR is not currently adopting updated salt water criteria for mercury or selenium, leaving in place the previous values which are based on the total recoverable metal in the second sentence of paragraph (a). Therefore, the reference to those parameters is a non-substantive change to standards and the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

The following new provision was added in subparagraph (9)(b):

> *(b) Compliance with acute instream metals standards shall only be evaluated using an average of two or more samples collected within one hour. Compliance with chronic instream metals standards shall only be evaluated using averages of a minimum of four samples taken on consecutive days, or as a 96-hour average;*

After review of this new provision, the EPA has concluded that it is not a new or revised water quality standard and is therefore taking no action on this provision. This provision does not establish or change a level of protection related to the magnitude, duration, or frequency of water quality criteria nor establish designated uses. Rather, this provision describes the sufficiency or reliability of information necessary for the State to decide whether a water attains or does not attain a water quality standard for purposes of establishing TMDLs under section 303(d)(1)(A) of the Act. As such, this provision is not a water quality standard but is a methodology under section 303(d) of the Act. See 40 C.F.R. § 130.7(b)(6). While the provision was not reviewed by EPA as a new or revised water quality standard, it may be considered by EPA in reviewing lists of impaired waters submitted by the State under Section 303(d) of the CWA. The decision to not review this provision in no way confers agreement with the use of the provision for making attainment decisions.

The following new subparagraph was added under (9)(c).

> *(c) Metals criteria shall be used for proactive environmental management. An instream exceedence of the numeric criterion for metals shall not be considered to have caused an adverse impact to the aquatic community without biological confirmation and a comparison of all available monitoring data and applicable water quality standards. This weight of evidence evaluation shall take into account data quality and the overall confidence in how representative the sampling is of conditions in the waterbody segment before an assessment of aquatic life use attainment, or non-attainment, is made by the Division. Recognizing the synergistic and antagonistic complexities of other water quality variables on the actual toxicity of metals, with the exception of mercury and selenium, biological monitoring shall be used to validate, by direct measurement, whether or not the aquatic life use is supported.*

As detailed more fully under the disapproval of similar language for freshwater under 15A NCAC .02B .0211(f), the EPA has advised the DWR on multiple occasions, including directly addressing this provision in writing on multiple occasions that the EPA does not support biological confirmation for

toxics assessment.[7] The EPA views biological criteria as one component of a comprehensive water quality standards program that works in concert with – not in place of – the use of water quality criteria for toxics as detailed further below. The EPA incorporates by reference all of the discussion in the disapproval under 15A NCAC .02B .0211(f).

The EPA has determined that the changes to subsection 15A NCAC 02B .0220 (9)(c) do not protect North Carolina's aquatic life use and, therefore, are not consistent with the CWA section 303(c) or its implementing regulations found at 40 C.F.R. section 131.11. Therefore, these changes are disapproved by the EPA under CWA section 303(c). With today's disapproval of this section, the new water quality criteria for metals in salt water as approved shall be used for all purposes under the Act. The EPA recommends that the State delete the biological confirmation provision during the next triennial review.

North Carolina adopted updated acute and chronic metals values under 15A NCAC 02B .0220 (9)(d) for salt water as follows:

> *(d) Acute and chronic tidal salt water quality metals standards are as follows:*
> *(i) Arsenic, acute: WER· 69 ug/l;*
> *(ii) Arsenic, chronic: WER· 36 ug/l;*
> *(iii) Cadmium, acute: WER· 40 ug/l;*
> *(iv) Cadmium, chronic: WER· 8.8 ug/l;*
> *(v) Chromium VI, acute: WER· 1100 ug/l;*
> *(vi) Chromium VI, chronic: WER· 50 ug/l;*
> *(vii) Copper, acute: WER· 4.8 ug/l;*
> *(viii) Copper, chronic: WER· 3.1 ug/l;*
> *(ix) Lead, acute: WER· 210 ug/l;*
> *(x) Lead, chronic: WER· 8.1 ug/l;*
> *(xi) Mercury, total recoverable, chronic: 0.025 ug/l;*
> *(xii) Nickel, acute: WER· 74 ug/l;*
> *(xiii) Nickel, chronic: WER· 8.2 ug/l;*
> *(xiv) Selenium, total recoverable, chronic: 71 ug/l;*
> *(xv) Silver, acute: WER· 1.9 ug/l;*
> *(xvi) Silver, chronic: WER· 0.1 ug/l;*
> *(xvii) Zinc, acute: WER· 90 [ug/l;]ug/l; and*
> *(xviii) Zinc, chronic: WER· 81 ug/l;*
>
> *With the exception of mercury and selenium, acute and chronic tidal saltwater quality aquatic life standards for metals listed above apply to the dissolved form of the metal and apply as a function of the pollutant's water effect ratio (WER). A WER expresses the difference between the measures of the toxicity of a substance in laboratory waters and the toxicity in site water. The WER [~~is~~]shall be assigned a value equal to one unless any person demonstrates to the Division's satisfaction in a permit proceeding that another value is developed in accordance with the Water Quality Standards Handbook: Second Edition'published by the US Environmental Protection Agency (EPA-823-B-12-002), free of charge, at http://water.epa.gov/scitech/swguidance/standards/handbook/, hereby incorporated*

[7] See Appendix B. EPA letters to DWR dated April 30, 2009, August 10th, 2010, and January 3, 2014 and emails to DWR on August 22, 2014 and August 25, 2014.

by reference including any subsequent amendments. Alternative site-specific standards may also be developed when any person submits values that demonstrate to the Commissions' satisfaction that they were derived in accordance with the Water Quality Standards Handbook: Second Edition, Recalculation Procedure or the Resident Species Procedure", hereby incorporated by reference including subsequent amendments at http://water.epa.gov/scitech/swguidance/standards/handbook/. This material is available free of charge;

The EPA notes that the DWR is not currently adopting updated criteria for mercury or selenium, leaving in place the previous values which are based on the total recoverable metal. Those metals have been reordered for alphabetizing purposes only. As the numeric value did not change for either of these criteria, the EPA determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that its approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

For comparison purposes, all other salt water metals are listed in the chart below alongside the EPA's current national recommended criteria.

Metal (all values are dissolved)	**NCDWR's Criteria** (all values ug/l)	**EPA's National Recommended criteria** (all values ug/l)
Arsenic (acute)	69	69
Arsenic (chronic)	36	36
Cadmium (acute)	40	40
Cadmium (chronic)	8.8	8.8
Chromium VI (acute)	1100	1100
Chromium VI (chronic)	50	50
Copper (acute)	4.8	4.8
Copper (chronic)	3.1	3.1
Lead (acute)	210	210
Lead (chronic)	8.1	8.1
Nickel (acute)	74	74
Nickel (chronic)	8.2	8.2
Silver (acute)	1.9	1.9
Silver (chronic)	0.1	--
Zinc (acute)	90	90
Zinc (chronic)	81	81

With the exception of the chronic value for silver, the DWR is directly adopting the EPA's national recommended values for saltwater acute and chronic criteria for metals in saltwater.

The EPA initially published a national recommended criteria for silver in 1980 (EPA 1980). In that document, the EPA recommended that the total recoverable acute silver criteria should not exceed 2.3 ug/ at any time. However, data were not available to develop chronic criteria for salt water. In 1990, the EPA published draft chronic criteria for silver, but after public comment determined that more research was

needed. In a 1992 memo, the EPA addressed how to review chronic silver salt water criteria from states (EPA 1992b). That memo noted that, "States which choose, of their own accord, to take an approach which generates chronic standards, either from data in the 1980 final document, the 1990 draft or other sources, are taking an approach more stringent than EPA criteria, and these standards are approvable." In order to develop its chronic silver criterion, the DWR stated that it they applied a safety factor of 0.05 to the 2.3 ug/l acute criterion from EPA's 1980 publication generating a chronic value of 0.1 ug/l.

As discussed in the approval of the freshwater metals criteria, the EPA's most current national recommended water quality criteria for protection of aquatic life includes the recommendation that fresh and salt water criteria for metals (including specifically arsenic, cadmium, chromium III, chromium VI, copper, lead, nickel, silver and zinc) be expressed in terms of the dissolved metal in the water column. In 1993, the EPA provided additional guidance on the use of the dissolved fraction of metals stating that, "[t]he use of dissolved metal to set and measure compliance with water quality standards is the recommended approach, because dissolved metal more closely approximates the bioavailable fraction of metal in the water column than does total recoverable metal" (EPA 1993).

As discussed in the review of the use of WERs under subparagraph .0211(11)(b), the use of WERs is consistent with the EPA's policy and guidance. The discussion in that section's review are incorporated into the review of this section by reference. The EPA concludes that the changes to subsection 15A NCAC 02B .0220(9)(d) to add in the use of a WER and to include a x1 multiplier in each of the criteria for the criteria in Table A is consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. Therefore, these changes are approved by the EPA under CWA section 303(c).The EPA strongly recommends that the first WERs developed by the State are reviewed in the study plan phase by the EPA to ensure that WERs that are developed meet the required procedures. The EPA looks forward to working with the State to ensure a quick review of the study plans so that the WERs may be used for CWA purposes once completed.

This section also allows for alternative site-specific standards to be developed using the Recalculation Procedure or the Resident Species Procedure in accordance with the *Water Quality Standards Handbook: Second Edition,* referenced as http://water.epa.gov/scitech/swguidance/standards/handbook/. In deriving site-specific criteria, the Recalculation Procedure (found at Appendix A of Appendix L of the WQS Handbook) takes into account the differences between the sensitivity of the species used in the national dataset in developing the national recommended criteria, and the organisms at the site. The Resident Species Analysis (see Chapter 3.7 - Developing Site-Specific Criteria of the WQS Handbook) accounts for that difference as well as the difference between the toxicity of the metal in lab water versus site water similar to a WER. Chapter 3.6 - Policy on Aquatic Life Criteria for Metals was updated to also include procedures to conduct a Streamlined Water-Effects Ratio Procedure for the Discharge of Copper that may also be used.

Considering the scientific and technical information supporting the 304(a) recommendations, the EPA has determined that all of the changes to subsection 15A NCAC 02B .0220(9)(d) protect North Carolina's aquatic life use and, therefore, are consistent with the CWA section 303(c) and 40 C.F.R. section 131.11. These changes are approved by the EPA under CWA section 303(c) for all purposes under the Act.

15A NCAC 02B .0220 Tidal Salt Water Quality Standards for Class SC Waters
Subparagraphs (10) through (19)

> *~~(f)~~(10) Oils, deleterious substances, colored, or other wastes: only such amounts as shall not render the waters injurious to public health, secondary-recreation, aquatic life, and wildlife or*

adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated uses. For the purpose of implementing this Rule, oils, deleterious substances, colored, or other wastes shall include substances that cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines under 40 C.F.R. 110.3;

(11) Pesticides:

(a) Aldrin: 0.003 ug/l;
(b) Chlordane: 0.004 ug/l;
(c) DDT: 0.001 ug/l;
(d) Demeton: 0.1 ug/l;
(e) Dieldrin: 0.002 ug/l;
(f) Endosulfan: 0.009 ug/l;
(g) Endrin: 0.002 ug/l;
(h) Guthion: 0.01 ug/l;
(i) Heptachlor: 0.004 ug/l;
(j) Lindane: 0.004 ug/l;
(k) Methoxychlor: 0.03 ug/l;
(l) Mirex: 0.001 ug/l;
(m) Parathion: 0.178 [ug/l;]ug/l; and
(n) Toxaphene: 0.0002 ug/l;

~~(g)~~(12) pH: shall be normal for the waters in the area, which ~~generally shall~~ range between 6.8 and ~~8.5~~ 8.5, except that swamp waters may have a pH as low as 4.3 if it is the result of natural conditions;

~~(h)~~(13) Phenolic compounds: only such levels as shall not result in fishflesh- tainting or impairment of other best usage;

(14) Polychlorinated biphenyls: (total of all PCBs and congeners identified) 0.001 ug/l;

~~(i)~~(15) Radioactive substances:

~~(i)~~(a) Combined radium-226 and radium-228: The ~~maximum~~ average annual activity level (based on at least one sample collected per quarter)~~four samples collected quarterly)~~ for combined radium226, and radium228 shall not exceed five -picoCuries- per liter;

~~(ii)~~(b) Alpha Emitters. The average annual gross alpha particle activity (including radium226, but excluding radon and uranium) shall not exceed 15 picoCuries- per liter;

~~(iii)~~(c) Beta Emitters. The ~~maximum~~ average annual activity level (based on at least one sample collected per quarter)~~four samples collected quarterly)~~ for strontium90 shall not exceed eight picoCuries- per liter; nor shall the average annual gross beta particle activity (excluding potassium-40 and other naturally occurring ~~radio-nuclides)~~ radionuclides exceed 50 picoCuries per liter; nor shall the ~~maximum~~ average annual activity level for tritium exceed 20,000 picoCuries per liter;

~~(j)~~(16) Salinity: changes in salinity due to hydrological modifications shall not result in removal of the functions of a PNA. Projects that are determined by the Director to result in modifications of salinity such that functions of a PNA are impaired ~~will~~ shall be required to employ water management practices to mitigate salinity impacts;

~~(k)~~(17) Temperature: shall not be increased above the natural water temperature by more than 0.8 degrees C (1.44 degrees F) during the months of June, July, and August nor more than 2.2 degrees C (3.96 degrees F) during other months and in no cases to exceed 32 degrees C (89.6 degrees F) due to the discharge of heated liquids;

(18) Trialkyltin compounds: 0.007 ug/l expressed as tributyltin;

~~(l)~~(19) Turbidity: the turbidity in the receiving water shall not exceed 25 Nephelometric Turbidity Units (NTU); ~~NTU;~~ if turbidity exceeds this level due to natural background conditions, the existing turbidity level shall not be increased. Compliance with this turbidity standard can be met when land management activities employ Best Management Practices (BMPs) [as defined by Rule .0202 of this Section] recommended by the Designated Nonpoint Source Agency (as defined by Rule .0202 of this Section). BMPs ~~must~~ shall be in full compliance with all specifications governing the proper design, installation, ~~operation~~ operation, and maintenance of such BMPs;

~~(m) Toxic substances: numerical water quality standards (maximum permissible levels) to protect aquatic life applicable to all tidal saltwaters:~~

~~(i) Arsenic, total recoverable: 50 ug/l;~~

~~(ii) Cadmium: 5.0 ug/l; attainment of these water quality standards in surface waters shall be based on measurement of total recoverable metals concentrations unless appropriate studies have been conducted to translate total recoverable metals to a toxic form. Studies used to determine the toxic form or translators must be designed according to the "Water Quality Standards Handbook Second Edition" published by the Environmental Protection Agency (EPA 823-B-94-005a) or "The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit From a Dissolved Criterion" published by the Environmental Protection Agency (EPA 823-B-96-007) which are hereby incorporated by reference including any subsequent amendments. The Director shall consider conformance to EPA guidance as well as the presence of environmental conditions that limit the applicability of translators in approving the use of metal translators;~~

~~(iii) Chromium, total: 20 ug/l;~~

~~(iv) Cyanide: 1.0 ug/l;~~

~~(v) Mercury: 0.025 ug/l;~~

~~(vi) Lead, total recoverable: 25 ug/l; collection of data on sources, transport and fate of lead shall be required as part of the toxicity reduction evaluation for dischargers that are out of compliance with whole effluent toxicity testing requirements and the concentration of lead in the effluent is concomitantly determined to exceed an instream level of 3.1 ug/l from the discharge;~~

~~(vii) Nickel: 8.3 ug/l; attainment of these water quality standards in surface waters shall be based on measurement of total recoverable metals concentrations unless appropriate studies have been conducted to translate total recoverable metals to a toxic form. Studies used to determine the toxic form or translators must be designed according to the "Water Quality Standards Handbook Second Edition" published by the Environmental Protection Agency (EPA 823-B-94-005a) or "The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit From a Dissolved Criterion" published by the Environmental Protection Agency (EPA 823-B-96-007) which are hereby incorporated by reference including any subsequent amendments. The Director shall consider conformance to EPA guidance as well as the presence of environmental conditions that limit the applicability of translators in approving the use of metal translators;~~

~~(viii) Pesticides:~~

~~(A) Aldrin: 0.003 ug/l;~~

~~(B) Chlordane: 0.004 ug/l;~~

~~(C) DDT: 0.001 ug/l;~~

~~(D) Demeton: 0.1 ug/l;~~

~~(E) Dieldrin: 0.002 ug/l;~~

~~(F) Endosulfan: 0.009 ug/l;~~

~~(G) Endrin: 0.002 ug/l;~~

~~(H) Guthion: 0.01 ug/l;~~

~~(I) Heptachlor: 0.004 ug/l;~~

~~(J) Lindane: 0.004 ug/l;~~

~~(K) Methoxychlor: 0.03 ug/l;~~

~~(L) Mirex: 0.001 ug/l;~~

~~(M) Parathion: 0.178 ug/l;~~

~~(N) Toxaphene: 0.0002 ug/l;~~

~~(ix) Polychlorinated biphenyls: (total of all PCBs and congeners identified) 0.001 ug/l;~~

~~(x) Selenium: 71 ug/l;~~

~~(xi) Trialkyltin compounds: 0.007 ug/l expressed as tributyltin.~~

The struck provisions for arsenic, cadmium, chromium, lead and nickel are replaced by new criteria as described in detail above. The criteria for the remaining criteria were moved into alphabetical order. As the numeric value did not change for these criteria, the EPA determined that it is non-substantive and therefore, the EPA approves the revision as being consistent with the CWA and the EPA's implementing regulations. The EPA notes, however, that is approval of this non-substantive change does not re-open the EPA's prior approval of the underlying substantive WQSs.

15A NCAC 02B .0220 Tidal Salt Water Quality Standards for Class SC Waters Subparagraph (20)

~~(1)~~(20) Action Levels for Toxic ~~Substances:~~Substances Applicable to NPDES Permits:

(a) ~~Copper:~~Copper, dissolved, chronic: ~~3 ug/l;~~3.1 ug/l;

(b) ~~Silver:~~Silver, dissolved, chronic: 0.1 ug/l;

(c) ~~Zinc:~~Zinc, dissolved, chronic: ~~86 ug/l;~~81 ug/l

If the [~~chronic~~] ~~Action Levels~~ action levels for any of the substances listed in this ~~Subparagraph~~Item (which are generally not bioaccumulative and have variable toxicity to aquatic life because of chemical form, solubility, stream ~~characteristics~~ characteristics, or associated waste characteristics) ~~are~~ shall be determined by the waste load allocation to be exceeded in a receiving water by a discharge under the ~~specified low~~7Q10 flow criterion for toxic ~~substances (Rule .0206 in this Section),~~substances, the discharger shall ~~be required to~~ monitor the chemical or biological effects of the discharge; efforts shall be made by all dischargers to reduce or eliminate these substances from their effluents. Those substances for which ~~Action Levels~~ action levels are listed in this ~~Subparagraph~~Item ~~may~~shall be limited as appropriate in the NPDES permit if sufficient information (to be determined for metals by measurements of that portion of the dissolved instream concentration of the ~~Action Level~~ action level parameter attributable to a specific NPDES permitted discharge) exists to indicate that any of those substances may be a causative factor resulting in toxicity of the effluent. ~~NPDES permit limits may be based on translation of the toxic form to total recoverable metals. Studies used to determine the~~

~~*toxic form or translators must be designed according to: "Water Quality Standards Handbook Second Edition" published by the Environmental Protection Agency (EPA 823-B-94-005a) or "The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit From a Dissolved Criterion" published by the Environmental Protection Agency (EPA 823-B-96-007) which are hereby incorporated by reference including any subsequent amendments. The Director shall consider conformance to EPA guidance as well as the presence of environmental conditions that limit the applicability of translators in approving the use of metal translators.*~~

Revision to Copper, Silver and Zinc as an Action Level

As the EPA has advised the DWR on multiple occasions, including directly addressing this provision in multiple letters,[8] the EPA does not support the maintenance of action levels. The EPA reiterates its previous comments. The EPA's Section 304(a) criteria were developed to take into account specific factors such as solubility and chemical form in determining the biologically available fraction available for uptake by biological organisms and, therefore, the fraction most likely to cause a toxic effect.

North Carolina's action level requirements, stated above, indicate that NPDES limits must be set for metals if information exists to indicate that a particular substance may be a *causative* factor resulting in the toxicity of the effluent. 40 C.F.R. 122.44(d)(1)(i) states that limits must be put in place to control pollutants which may be discharged at a level "which will cause, have the reasonable potential to cause or contribute to an excursion above any State water quality standard." This regulation does not indicate that the effluent must be the sole cause of toxicity before the parameter should be limited. The provision states that the pollutant should be limited under NPDES if it could cause or even if it could *contribute* to a water quality standards excursion.

This requirement is significant because there may often be multiple sources of pollutants in receiving waters, from non-point source run-off, from point sources and from storm water. No one facility or source may be the sole cause of the impairment, but rather multiple discharges contribute to the toxicity and excursion of water quality standards. Therefore, when a point source discharges zinc levels with a reasonable potential to cause or contribute to exceedence of water quality standards, that discharge must be limited. Surrounding states have limited zinc and copper in permits where there is reasonable potential to cause or contribute to the excursion of a water quality standard.

The Region recognizes that North Carolina has a strong WET testing program. WET testing can be "effective for controlling discharges containing multiple pollutants. It can also provide a method for addressing synergistic and antagonistic effects on aquatic life" from multiple pollutants. See 63 Fed. Reg. (page 36,768). However, where criteria exist to directly control toxic pollutants, those criteria should be used to limit the discharge of pollutants. WET should be used to address those instances where criteria may not be available to limit toxicity. The EPA's discussion of reconciling biological data, such as WET, with 'reasonable potential' analysis concludes "EPA would not support a radical shift away from chemical criteria and limits or toxicity criteria and limits. Those tools are simply too important as proven tools for assessing potential impact to surface waters and improving water quality." If needed, an effort should be made to refine the applicable criteria, through WERs and other tools, to ensure that appropriate criteria be developed for each facility. It is not protective, however, and is not consistent with EPA's permitting regulations, to defer permit limitations once there is reasonable potential to exceed the water

[8] See Appendix B. EPA letters to DWR dated April 30, 2009, August 20, 2010, and January 3, 2014 and emails to DWR on August 22, 2014 and August 25, 2014.

quality criteria for toxics.

The EPA has determined that the changes to subsection 15A NCAC 02B .0211(20) do not protect North Carolina's aquatic life use and, therefore, are not consistent with the CWA section 303(c) or its implementing regulations found at 40 C.F.R. section 131.11. These changes are disapproved by the EPA under CWA section 303(c). With today's disapproval of this section, the new water quality criteria for metals as approved shall be used for all purposes under the Act. For more discussion on the implications of the EPA's disapproval, see pages 30-31.

Review of Water Quality Standards Variances

Under 40 C.F.R. section 131.20, each state is required, at least once every three years, to re-examine any water body segment with water quality standards which do not include the uses specified in section 101(a)(2) of the CWA to determine if any new information has become available to indicate the uses are now attainable. North Carolina has three variances from water quality standards in the State, which are subject to this triennial evaluation requirement. During the triennial, the State provided a notice of an opportunity to comment on and conducted a review of each of the variances to water quality standards.

Evergreen Packaging (formerly Blue Ridge Paper Products, NPDES Permit No. NC0000272) has a water quality standards variance for color. The most recent permit reissuance and variance renewal was issued by the State on July 21, 2010. The EPA reviewed and approved the variance on December 21, 2010. A comprehensive review and evaluation of the status of the variance is ongoing concurrent with the facility's permit reissuance process, which will include public hearings and opportunity for comments. Comments received by the State during the triennial will be considered during the permit and variance review as well.

Both Mount Olive Pickle Company (NPDES Permit No. NC0001074) and Bay Valley Foods (formerly Dean Pickle Products, NPDES Permit No. NC0001970) have excess sodium chloride from pickle processing. Limited technology exists for removal of sodium chloride from the waste stream. New variances were issued by the State on March 29, 2011. The EPA approved those variances on September 27, 2011. The information collected during this triennial review will be used for the next scheduled permit and variance review.

APR 6 2016

Date

Heather McTeer Toney
Regional Administrator

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