

**From:** [Bill McLarney](#)  
**To:** [Painter, Andy](#)  
**Cc:** ["Jason Meador"](#)  
**Subject:** comments on 303(d) assessment  
**Date:** Tuesday, October 02, 2012 11:04:57 AM

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Dear Mr. Painter,

My comments seem to work better in this format than through use of the form provided. I apologize for any inconvenience this may cause.

By way of introduction, I am since 1990 the Director of the Upper Little Tennessee Watershed Stream Biomonitoring Program, currently managed by LTLT, based in Franklin. Over the years I have had ample opportunity to work together with, and observe biomonitoring crews from your and other state and federal agencies. This leads me to 3 personal comments, which do not necessarily reflect the opinion of LTLT:

1. Referring first to fish-based IBI: I had my apprenticeship in IBI working with Charlie Saylor and other TVA biologists, and the IBI used by the LTLT is very similar to those used by TVA. On

occasions when I have assisted with NCDWQ crews and applied LTLT/TVA metrics to their data – and vice versa if I apply your metrics to our sample data – there is a fairly consistent difference, with the NCDWQ metrics tending to score higher. In my observation NCDWQ IBI scores and bioclass ratings align better with ratings derived from benthic macroinvertebrate sampling, which would seem to be a point in their favor. However, I suggest that this obscures what should be the actual complementarity of the two methods. In my opinion, most macroinvertebrate-based assessment methodologies are more sensitive to water quality issues than fish-based methodologies. However, fish-based IBI better reflects impacts to habitat quality.

In the mountain region where I work, with notable exceptions, impacts to fish habitat are more frequent and severe than impacts from water pollution. If the goal of your program is to assess the health of our streams, then I suggest a comparison of your fish IBI metric criteria with TVA and other criteria, probably leading to adjustments to more accurately reflect impacts to habitat. But if designation of “impaired” waters is inextricably tied to water quality, then for that purpose emphasis should probably be on benthic biomonitoring, complemented by determination of ambient parameters.

2. To the degree that habitat quality is a concern, I would like to draw attention to ongoing U. Georgia/Coweeta work on refinement of the USDA Stream Visual Assessment Protocol (SVAP)

for the Southern Appalachian region. We have made informal use of SVAP for some years now, and hope to incorporate the modified index (saSVAP) into our routine work in 2013. This will permit evaluation of a far greater number of sites than can be accommodated through biomonitoring methodologies. As a very non-intrusive method, it also avoids all the issues attendant on efforts by lay persons to measure biological parameters. To the degree that DWQ is able to apply or promote this sort of low-cost, simple habitat assessment, it can serve as a “flagging” mechanism to help in the selection of sites for follow-up with biomonitoring, ambient monitoring and/or more sophisticated habitat assessment methodologies. This would also be a

positive for the DWQ in p.r. terms.

3. For some years now, I have expressed ethical concerns with the DWQ's fish sampling methodology, in terms of the high fish mortality which often results. If I compare catch data from

DWQ and LTLT or TVA samples from the same sites, I find no reason to prefer one over the other - both achieve what appear to be representative samples. The advantage of the DWQ methodology is that it is more efficient; I have no doubt that a DWQ crew can get more fish samples done in a work week than we could, even absent the delays attendant on employment of volunteers. But I question whether that justifies extreme high mortality of fish. This is not only an ethical issue, but sometimes a p.r. issue as well. I vividly remember an incident (in Georgia, not North Carolina, but involving a similar methodology), where a landowner came upon us digging a hole to bury a sizable quantity of fish, including catchable trout. I suggest that it would be to everyone's benefit to sacrifice a measure of efficiency to avoid high fish mortality and bad p.r.

Please feel free to get back to me on any of this; I hope it is helpful.

Sincerely,

Dr. William O. McLarney  
Director, Stream

Biomonitoring Program

LTLT

November 26, 2012

Mr. Andy Painter  
NCDENR - Division of Water Quality Planning  
Modeling and TMDL Unit  
1617 Mail Service Center  
Raleigh, NC 27699-1617

Subject: Comments from City of Charlotte  
NC Water Quality Assessment Methodology

Dear Mr. Painter:

The City of Charlotte appreciates the opportunity to provide comments to the Division of Water Quality (DWQ) regarding the water quality assessment methodology. We offer the comments below for your consideration under the public review and comment period.

**Biology of aquatic systems is too variable and the recovery of biological indicators is not adequately documented to warrant developing a TMDL for a single biological sample, therefore a single biological sample should not be used to place a water body on the 303(d) list.**

Although it is acknowledged that biological sampling is intended to represent water quality conditions integrated over time, we believe that a single data point should not be used to conclude that a water body is impaired, thus triggering TMDL development. The inherent variability of natural systems is too broad and there are too many natural, climatic influences (for example drought conditions) that drive the biology of a stream. These factors are not able to be addressed by a TMDL and should be considered before listing a waterbody as impaired.

A single biological sample should be used to indicate the need for more intensive monitoring to determine if 1) there is indeed a water quality problem versus an isolated event resulting in poor sample timing and 2) if the biology is reacting to anthropogenic drivers. At the very least, communication with local authorities should be initiated to determine if there is any existing data that can augment the single biological sample. With this approach, an impairment has better potential to be categorized appropriately and limited resources can be directed towards minimizing pollutant loads that adversely affect biological integrity.

**DWQ should be more explicit in their solicitation for data that can be used for use assessment and thus influence the 303(d) list.**

DWQ maintains a standing solicitation for data on their website at the following address: <http://portal.ncdenr.org/web/wq/ps/mtu/assessment>. The standing solicitation should be made more apparent to the general public and local governments prior to developing the 303(d) list. A notice should go out including this link at a time suitable for accepting data for an upcoming list. This notice should coincide with notification of newly collected data by NCDWQ, so that water bodies lacking enough data to support a conclusion can be augmented by locally collected data, if available.

Mr. Andy Painter  
NCDENR - Division of Water Quality  
November 26, 2012

**Data should be included based on quality and procedures and not excluded due to age.**

In the USEPA Decision Document for the Partial Approval of the North Carolina Department of Environment and Natural Resources' 2012 Section 303(d) List submitted on March 30, 2012, the EPA "recommends that older data not be automatically excluded, particularly when its inclusion could be used to augment small sets of more current data." We agree with this statement with the caveat that data are collected in a manner that is consistent with DWQ requirements related to Submitting Data for Regulatory Use.

**DWQ should make their Random Ambient Monitoring locations available to the public as they are planned.**

A schedule of DWQs Random Ambient Monitoring locations should be made available to the general public. This will allow organizations that collect water quality data to be aware of DWQs data collection efforts and supplement those efforts if possible. Where data is already collected by another agency, an impairment can be more accurately defined with regards to the pollutant causing the impairment and the extent of the impairment (stream miles).

**A procedure should be defined to address the occurrence of conflicting data.**

When two sources of data are collected on one waterbody and the results are in conflict, procedures should be outlined and some forum should be available to discuss the disagreement. The source of the conflict should be determined before classifying the waterbody as impaired.

**The assessment methodology should be periodically reviewed by the Environmental Management Commission.**

The consequences of listing a water body as impaired can be dramatic, as the federal Clean Water Act requires development of a Total Maximum Daily Load (TMDL) in response to the listing. Developing and implementing a TMDL can encumber valuable resources and the assessment methodology should be based in sound science, vetted in a transparent matter and stand up to reasonable scrutiny. Periodic review of assessment methodology will ensure that the methods accurately characterize waterbodies within the state.

Should you have any questions or need additional information, please contact me at 704-336-2167 or Kyle Hall at 704-336-4110.

Sincerely,



Daryl Hammock, PE  
Water Quality and Environmental Permitting Manager

Kyle Hall, Storm Water Services  
Jennifer Frost, Storm Water Services



To report pollution or drainage problems, call: 311  
<http://charmec.org/stormwater>



**Painter, Andy**

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**From:** andy.painter@ncdenr.gov  
**Sent:** Monday, October 29, 2012 11:26 AM  
**To:** Painter, Andy  
**Subject:** Assessment public comment

Name : David Kroening

Organization : Charlotte Mecklenburg Storm Water Services Mailing Address : 700 North Tryon Street, Charlotte, NC 28211 Email Address : [David.Kroening@MecklenburgCountyNC.gov](mailto:David.Kroening@MecklenburgCountyNC.gov)

Select Methodology (Refer to the 2014 North Carolina Draft Assessment Methodology link above)  
: Other

Describe Proposed Change(s) to Assessment Methodology (Include in description the proposed method for determining impairment as well as method for determining a water body is not impaired). : 1) As a NPDES Phase II permit holder where certain permit items require the evaluation and assessment of 303(d) listed waters, we believe that the data used to list a water body were readily available. Often locally collected data conflicts with a listing and a first step in the evaluation process is to compare local data with data collected by the North Carolina Department of Environment and Natural Resources (NC DENR). Making the specific set of data used to support a listing or re-categorization available would be very beneficial during our analysis.

2) Data collected by the Random Ambient Monitoring System is often used by NC DENR for listing or re-categorizing waters. It would be very beneficial if this data were available on the NC DENR website directly as soon as analysis results are available. It is unknown if this data is uploaded to STORET and if it is identified within STORET to distinguish it from other data sets.

3) Data collected by NC DENR is only uploaded to STORET once per year. Data should be available in another format (such as Microsoft Excel or Access), however if STORET is the only option, data should be uploaded on a monthly basis.

4) Macroinvertebrate, fish and habitat data collected by NC DENR does not appear to be readily available. This information may be in STORET however we have not been able to locate it. It would be very helpful to have access to this information in a more user friendly format.

Provide Rationale for Proposed Change (Provide the justification for changing the existing assessment methodology to the proposed methodology. Include references where applicable). : Primarily, our comments focus upon data availability and accessibility. Improving these issues should be a priority in the upcoming years as more and more requirements for assessing waters and understanding impairment is being placed on permittees.

Other Comments on the Assessment Methodology :



*Duke Energy Corporation  
P. O. Box 1551  
Raleigh, NC 27602*

November 26, 2012

**Sent Via E-mail (kathy.stecker@ncdenr.gov)**

Ms. Kathy Stecker  
North Carolina Division of Water Quality  
1617 Mail Service Center  
Raleigh, NC 27699-1617

Re: NC Water Quality Assessment Methodology

Dear Ms. Stecker:

Carolina Power & Light Company, doing business as Progress Energy Carolinas, Inc., and Duke Energy Carolinas (hereafter referred to as the Companies) are regulated electric utilities operating in North Carolina and South Carolina that serve approximately 3.9 million homes, businesses and industries. The Companies are subsidiaries of Duke Energy Business Services LLC, which is the largest electric holding company in the United States, supplying and delivering energy to approximately 7.1 million electric customers located in six states in the Southeast and Midwest. It owns a diverse mix of approximately 58,200 megawatts of electric generating capacity in the U.S. that includes coal, nuclear, natural gas, oil, and renewable resources.

The Companies received electronic mail via a LISTSERV (denr.dwq.TMDL303d mailing list) dated September 21, 2012 announcing that the North Carolina Division of Water Quality (DWQ) was seeking public comment on the water quality assessment methodology that is used to identify impaired waters. As you know, the Companies own and operate several major electric generating facilities in NC. Many of those facilities have obtained, and must comply with, National Pollutant Discharge Elimination System (NPDES) permits. These NPDES permits contain limits and conditions necessary to protect water quality. Consequently, a determination that a water body is impaired can have a profound impact on facility permit limits and the cost of compliance. The Companies have significant interest in the assessment methodologies used to make impairment decisions and offer the following the comments:

**The Data Availability and Quality section should be modified to recognize that data collected by a biological laboratory that has been certified pursuant to 15A NCAC 02H .1100 and analyzed by a laboratory that has been certified pursuant to 15A NCAC 02H .0800, satisfies the data quality assurance requirements of the UAM.**

The rules at 15A NCAC 02H .1100 set forth the requirements for certification of commercial, industrial, and public laboratories to perform biological toxicity testing and population

surveys of water and wastewater as required for NPDES permits. Additionally the rules at 15A NCAC 02H .0800 set forth the requirements for certification of laboratories which perform and report analyses for persons subject to the NPDES and other programs. The Companies believe the requested modification to the Data Availability and Quality language would streamline the data submittal and acceptance process.

**The Fish Consumption Assessment Methodology is fundamentally flawed and accordingly, major revisions are recommended.**

The Fish Consumption Assessment Methodology essentially depends on *ad hoc* targets developed by the NC Department of Health and Human Services (DHHS). DWQ's use of statewide fish consumption advisories developed by the DHHS effectively circumvents the standards-setting and review process established in §303(c) of the Clean Water Act and the NC Administrative Procedures Act. Impairment decisions should be based solely on duly promulgated water quality criteria. For narrative criteria, only duly adopted translator procedures should be employed.

Another concern with DWQ's use of fish consumption advisories developed by DHHS for identifying impaired waters is that many of the procedural requirements established elsewhere in the Use Assessment Methodology (UAM) are potentially circumvented. For example, the UAM specifies that the "data window/assessment period" for the most recent assessment (2012) included data collected during the period 2006 through 2010. Whether or not DHHS also uses recent data per the period specified in the Methodology for maintaining its consumption advisories is unknown. The use of recent data is a critical issue for dischargers that have installed new, or modified existing, wastewater treatment facilities. Utilization of DHHS advice or advisories should not circumvent the UAM.

The Companies recommend the following revisions:

**A. The state's water quality criterion of 0.012 µg/L should not be included in the "Mercury Assessment Criteria" for determining impairment for fish consumption.**

The criterion of 0.012 µg/L was developed in the mid 1980's by the EPA and serves as a prompt for evaluation of fish tissue data. EPA's 1984 criteria document titled *Ambient Water Quality Criteria for Mercury* states "If the four-day average concentration exceeds 0.012 µg/L more than once in a three-year period, the edible portion of consumed species should be analyzed to determine whether the concentration of methylmercury exceeds the FDA action level." Consequently, this water column value was only intended to trigger the need for further assessment of fish tissue and not as a determination of fish consumption impairment per se.

**B. The data used to assess fish tissue concentrations that would potentially trigger the fish consumption advisory must be clearly identified.**

DHHS's fish consumption advisory for mercury illustrates the Companies' concern and supports the basis for this comment. A document is posted on DHHS's website titled "Technical Health Effects of Methylmercury and North Carolina's Advice on Eating Fish." The document is dated 2006 and according to footnotes contained in the document, analyzes fish tissue data collected from 1990 through 2003 [Footnote (g): Mercury Concentrations in NC Fish Tissue Summarized by County 1990-2003. Requested by Dr. Luanne K. Williams with the North Carolina Division of Public Health. Prepared by Mr. Mark Hale with the North Carolina Division of Water Quality"]. However, for DWQ's most recent UAM (2012), no information has been provided about the quality or age of the fish tissue data used that would support a continuation of the advisory. Based on information presented by DWQ, mercury air emissions were reduced by 65% from 2003 to 2010. This reduction should have had a profound impact on fish tissue data and the continuation of a statewide impairment designation based on outdated data would be inappropriate

**C. The statistical methods employed to interpret the data should be clearly described.**

In the North Carolina Mercury TMDL (September 2012), the following statement is made regarding fish tissue assessment: "*To protect water bodies from impairment, the 90th percentile standardized-length Largemouth Bass (LMB) fish tissue total mercury concentration is selected to meet the target level.*" This methodology is not mentioned in the UAM but clearly should be. In its guidance, EPA strongly recommends that such statistical interpretations be fully explained and included in 303(d) use assessment/listing methodologies, especially if the interpretation becomes the primary basis for listing decisions. Accordingly, the UAM should be modified to require that DWQ provide a basis for their methodology, direct access to the specific data used and the statistical data evaluations that support impairment decisions.

**D. The UAM should be consistent with EPA's guidance for assessing mercury in fish tissue.**

EPA has developed guidance for assessing mercury in fish tissue (Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, EPA 823-R-10-001). In that guidance, EPA recommends the following:

"if target populations consume fish from different trophic levels, the state or authorized tribe should consider factoring the consumption by trophic level when computing the average methylmercury concentration in fish tissue. To take this approach, the state or authorized tribe would need some knowledge of the fish species consumed by the general population so that the state or authorized tribe could perform the calculation using only data for fish species that people commonly eat."



The Companies recommend that the assessment methodology for mercury in fish tissue include a trophic level weighted average approach of all fish species actually consumed consistent with EPA guidance.

**E. Fish consumption advisories should be employed for impairment decisions only for water bodies for which segment-specific data justify the advisory.**

In its Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, EPA clearly discourages the use of fish consumption advisories as a basis for impairment decisions without segment-specific data. The Companies recommend that impairment decisions based on fish consumption advisories be avoided unless there is segment-specific data to support the advisory.

**The UAM should include a new section describing the process by which a waterbody may be delisted.**

Based on the Companies' understanding of federal regulations, waters previously deemed impaired may be removed from the impaired waters list ("delisted") for good cause. EPA's good cause factors include: (1) more recent or more accurate data; (2) more sophisticated water quality monitoring; (3) flaws in the original analysis; (4) reassessment of data under the new listing methodology; (5) demonstration that more stringent effluent limitations are in place to produce attainment; (6) demonstration that other pollution control requirements are in place to produce attainment; or (7) demonstration that the impairment is not caused by a pollutant. The Companies recommend that the UAM include reasonable and explicit decision rules for evaluating these "good cause factors."

The Companies appreciate the opportunity to provide comments on this important matter. Please do not hesitate to contact me at 919-564-5438 if you have any questions.

Sincerely,



Mick Greeson  
Director, Environmental Affairs – North Carolina

cc: NC Environmental Management Commission  
Mr. Charles R. Wakild, Director

**Painter, Andy**

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**From:** Hopkins.Marion@epamail.epa.gov  
**Sent:** Monday, November 26, 2012 2:02 PM  
**To:** Painter, Andy  
**Cc:** Behm, Pamela; Stecker, Kathy; Mcnutt, Cam; wetherington.michele@epa.gov; Zimmer.Andrea@epamail.epa.gov; Gordon.Lisa-Perras@epamail.epa.gov; Singh-White.Alya@epamail.epa.gov  
**Subject:** NCDWQ 2014 303d Assessment Methodology Comments

Dear Mr. Painter,

This correspondence is in response to the North Carolina (NC) Division of Water Quality (DWQ) request for public comments on the assessment methodology for the Clean Water Act (CWA) Section 303(d) list for the 2014 listing cycle. As noted in the public comment instructions, the U.S. Environmental Protection Agency has provided guidance to help ensure consistency with CWA assessment, listing and reporting requirements (<http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/>). Public participation is an important part of the process.

Section 303(d)(1) of the CWA directs states to identify those waters within its jurisdictions for which effluent limitations are not stringent enough to implement any applicable water quality standard (WQS). Nonattainment of the WQSs is determined by examining all existing and readily available water quality-related data and information. The assessment methodology constitutes the decision process that a state uses to conduct this examination. It is important that the assessment methodology be consistent with applicable WQSs. It should also be consistent with sound science and statistics. In addition to the EPA program guidance referenced above, the EPA has provided a framework to help in developing an appropriate methodology (*Consolidated Assessment and Listing Methodology – Toward a Compendium of Best Practices*, July 2002, <http://water.epa.gov/type/watersheds/monitoring/calm.cfm>).

Section 303(d)(2) of the CWA directs states to submit the section 303(d) list to the EPA, and EPA is required to approve, partially approve/disapprove, or disapprove that list. The EPA's decision will be based on a determination that the State reasonably considered all existing and readily available data and information and listed all waters not attaining WQSs. Where waters and/or impairments are being *delisted* from the previous list, the State must demonstrate “good cause” (40 CFR 130.7(b)(6)(iv)). To demonstrate “good cause,” the State is expected to provide justification, which can be included in the list or the assessment methodology, of why the water and/or impairment was delisted.

When EPA can conclude that the State’s assessment methodology properly implements applicable WQS and federal 303(d) regulations for each category of impairment, the methodology will be used as the basis for approval. When that conclusion cannot be made, EPA will conduct an independent assessment and review water quality data for each relevant category to determine if additional impairments should be added to the 303(d) list.

The 2012 Decision Document for NC’s 2012 303(d) list, referenced in the DWQ public comment instructions and posted at [http://portal.ncdenr.org/c/document\\_library/get\\_file?uuid=4f002060-a014-428b-b504-c1bf1387d752&groupId=38364](http://portal.ncdenr.org/c/document_library/get_file?uuid=4f002060-a014-428b-b504-c1bf1387d752&groupId=38364), includes Region 4’s detailed comments on the 2012 assessment methodology (which is the same as the 2014 methodology). During this and previous evaluations of NC 303(d) submittal packages, Region 4 identified portions of the State’s assessment and listing methodology that may result in failure to identify all impaired waters. These are: (1) the State’s use of the “greater than ten percent exceedence” test as a method to assess toxic pollutants; and (2) provisions that limit the use of data based on sample size and age of data.

## Toxics

NC's WQSs for toxics, as currently documented in DWQ's *Redbook* (Amended Effective May 1, 2007; available on the DWQ Classification and Standards Unit webpage:

<http://portal.ncdenr.org/web/wq/ps/csu>), are specified as "maximum permissible levels." Because the NC WQSs do not define the conditions of toxicity (acceptable duration and frequency), one interpretation of the WQSs could be that no digressions are permissible in the waters of the state; i.e., one sample value over the applicable criterion is cause for listing the water as impaired. The DWQ assesses its waters for toxics by using a greater than ten percent exceedance frequency. Use of this ten percent "rule of thumb" for interpreting water quality data is usually not consistent with criteria expressed as "maximum permissible levels," as NC's toxics criteria are.

Using a greater than ten percent exceedance frequency may lead to the conclusion that waterbody conditions are meeting or above the WQS, when in fact they are considerably worse (that is, pollutant concentrations exceed the criterion-concentration a far greater proportion of the time than specified by the criteria). When the number of samples is small, this approach can leave truly impaired waters off of the list. (See Section IV.G. "How should statistical approaches be used in attainment determinations?" in *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act*, July 29, 2005;

<http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/upload/2006irg-report.pdf>)

For toxics, the EPA CWA section 304(a) guidance recommends an average frequency for criteria excursions not to exceed once in three years. The EPA selected this frequency of criteria exceedance with the intent of providing time for ecological recovery (Water Quality Standards Handbook: Second Edition EPA-823-B-12-002; <http://water.epa.gov/scitech/swguidance/standards/handbook/>).

The State may use an alternative scientifically defensible methodology if it can show that the methodology is no less stringent than the WQS (40 CFR 131.11(b)). The EPA has determined that the State's ten percent exceedance methodology for toxics does not properly implement the WQS, as currently specified. DWQ is not required to use the EPA-recommended one-in-three method. However, DWQ has not provided a scientifically defensible rationale to support the ten percent methodology. Until DWQ provides this rationale, the EPA will continue to conduct an independent assessment and review water quality data to determine if additional toxics impairments should be added to the 303(d) list.

## Age of Data and Sample Size

North Carolina's assessment methodology contains provisions for limiting the use of data based on the age of data (five year window) and sample size (at least ten samples). We recommend States not automatically exclude data that is older than 5 years, particularly when its inclusion could be used to augment small sets of more current data. The assessment methodology could include a list of circumstances that would explain why the data is no longer reliable or representative. Many states make the decision of whether a small number of data points can adequately support a conclusion of impairment or nonimpairment based on whether the evidence for the small number of samples is "overwhelming." An overwhelming evidence test could consider such factors as the magnitude of exceedance over water quality standards, or the frequency at which standards were exceeded, or other lines of evidence (e.g., biological, physical, tissue, or sediment data) could be consulted in making an impairment decision on small data sets. Section 4.3 of the EPA's *Consolidated Assessment and Listing Methodology* guidance, referenced above, discusses this issue in detail.

In order for the EPA to conclude that the State's process is consistent with federal requirements for consideration of all existing and readily available data and information, the State should revise its

methodology to allow consideration of older data and data contained within smaller data sets for future section 303(d) lists.

In summary, the EPA will consider the state's methodology, to the extent that it reflects a reasonable interpretation of NC's WQs and sound science, in determining whether to approve or disapprove the section 303(d) list. Regardless of the suitability of the methodology, the EPA must review the list for consistency with the relevant provisions of the CWA and the regulations.

Thank you for the opportunity to comment. If you have questions, please contact me or Andrea Zimmer, Chief, Monitoring and Information Analysis Section at 404-562-9306.

Marion Hopkins  
U.S. EPA Region 4  
Water Protection Division  
Water Quality Planning Branch  
Monitoring & Information Analysis Section  
404/562-9481

Memo to: NC Division of Water Quality, in particular Nora Deamer, Kathy Stecker, Cam McNutt, Carrie Ruhlman  
From: Dr. Michael A. Mallin, Research Professor, UNC Wilmington Center for Marine Sciences  
Date: November 28, 2012  
Subject: NC DWQ / Coalition sampling methods issue

The NC Division of Water Quality recently asked for public comment regarding use assessment methodology and field sampling methods. This memo addresses in particular inadequacy of the current methods(s) for collecting chlorophyll *a* samples.

Historically, the Cape Fear River and estuary historically hosted few algal blooms due to two factors 1) the estuary has a relatively fast flushing time of approximately seven days (Ensign et al. 2004), and 2) Piedmont-derived turbidity (Mallin et al. 1999; Dubbs and Whalen 2008) and organic color from Coastal Plain tributaries (Mallin et al. 2004) combine to rapidly attenuate surface irradiance (light) in the water column. However, in recent years (2009-2012), this river has been host to annual, unprecedented cyanobacterial blooms consisting primarily, but not exclusively, of *Microcystis aeruginosa*, at one point impacting 75 miles of the river. These are surface blooms (see photograph below), thus they overcome the problem of available water column light. This species has long been known as a toxin-producing organism (Burkholder 2002). The blooms have occurred in the summer months; sometimes in early fall as well, and have centered in the reach of the river from just above Lock and Dam #1 downstream to the Black River (NCDWQ 2011). In 2011 additional cyanobacterial blooms (including *Microcystis*) occurred in the Northeast Cape Fear River, leading to strong hypoxia with dissolved oxygen levels falling to 0.7 mg/L (Stephanie Petter Garrett, NCDWQ, personal communication, July and August 2011). These blooms represent a serious emerging threat to the river both in terms of ecosystem health and human health.



The lower Cape Fear River and estuary are currently on the North Carolina 303(d) list for impaired water due to low dissolved oxygen, or hypoxia (NCDWQ 2005). One cause of hypoxia in the Cape Fear system is algal blooms. Long-term chlorophyll *a* and BOD data collected by

researchers from the University of North Carolina Wilmington (UNCW) have demonstrated that at Station NC11, just downstream of Lock and Dam #1, chlorophyll *a* and BOD are strongly correlated,  $r = 0.53$ ,  $p = 0.0001$  (Mallin et al. 2006). Such lowered DO can stress resident and migratory fish and even pose a migratory barrier. In 2012 my laboratory conducted chlorophyll and BOD sampling in bloom conditions and found that there is a strong statistical relationship between the two parameters (Fig. 1); i.e. algal blooms drive BOD in this oxygen stressed river. Whereas in the case of an isolated bloom such a BOD source may not be important, when such blooms extend for several river miles (as they frequently do) they can become a significant source of labile BOD. The relationship between these surface cyanobacterial blooms and BOD has not yet been addressed in models used to produce a needed TMDL in this river. Especially since these blooms occur in summer, when DO is already stressed, such an oversight must be corrected.

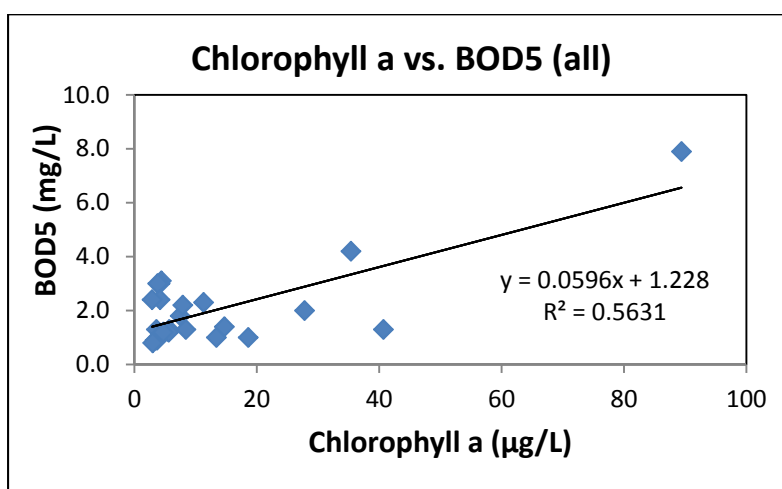


Figure 1. BOD as a function of chlorophyll *a* in July, 2012, Cape Fear River below Lock and Dam #1.

Regarding human and fish health, at least some of the blooms in the main stem of the Cape Fear have produced toxins. The North Carolina Division of Public Health had a 2009 bloom sample from Lock and Dam #1 tested and it came out positive for 73 ppb ( $\mu\text{g/L}$ ) of microcystin (Dr. Mina Shehee, NC Division of Public Health, memo September 25, 2011), resulting in an advisory to keep children and dogs from swimming in the waters. For comparison, the World Health Organization has a guideline of  $< 1.0 \mu\text{g/L}$  of microcystin-LR for drinking water. Additionally, a UNCW Marine Science student directed by chemist Dr. Jeff Wright isolated two hepatotoxins, microcystin LR and microcystin RR, from Cape Fear *Microcystis aeruginosa* blooms in 2009 (Isaacs 2011).

Despite the outbreak of these unprecedented blooms, current sampling methods do not reflect the magnitude of the problem. Based on the 2008 NPDES Discharge Monitoring Coalition Program Field Monitoring Guidance, Version 1.0, sampling for chlorophyll *a* is either to be done by grabs 15 cm below surface, or integrated sampling from 2X Secchi depth to the surface. However, the *Microcystis* blooms are massed at the surface. Sampling performed by my laboratory in summer

20102 demonstrates that surface sampling must be performed in order to properly quantify these blooms (Fig. 2).

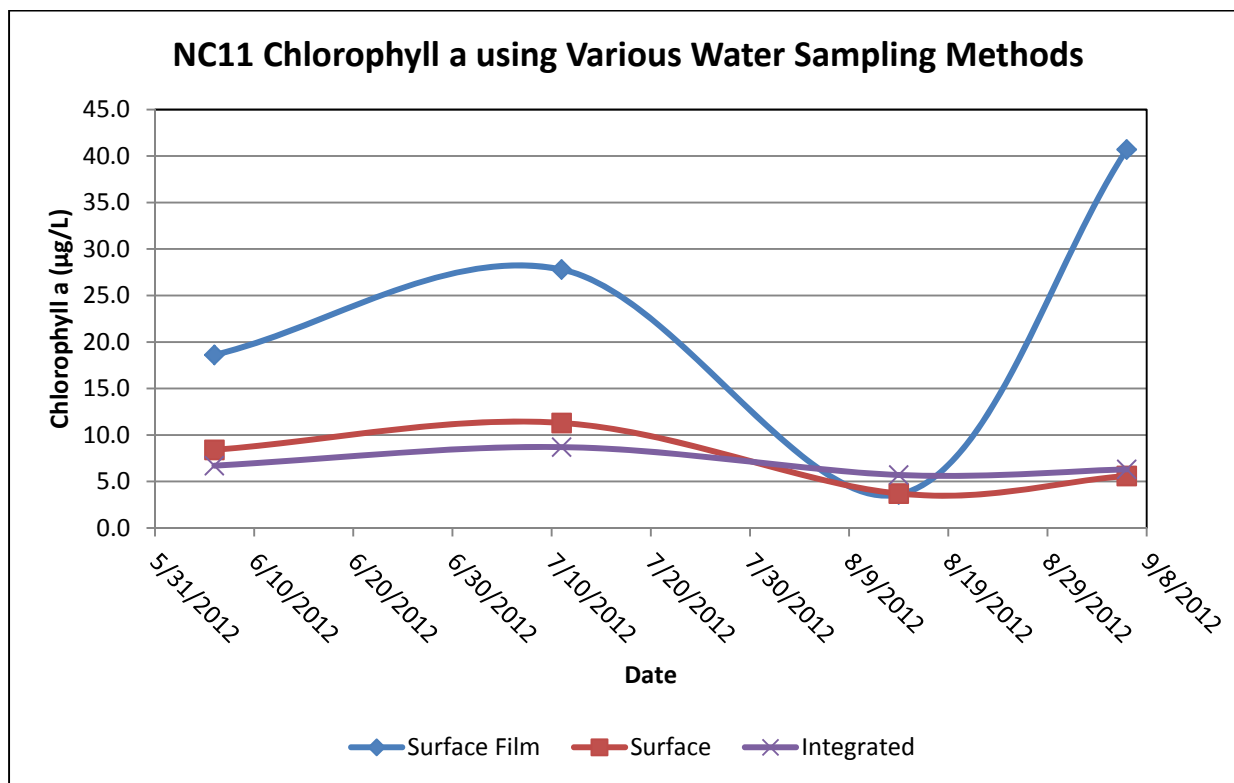


Figure 2. Illustration of summer 2012 sampling in the Cape Fear River below Lock and Dam #1, demonstrating that subsurface grab samples (shown in red, 15 cm below surface) and integrated sampling (shown in purple) both greatly underestimate *Microcystis* bloom biomass compared with surface film sampling (shown in blue).

Based on the cyanobacterial bloom formation frequency, extensive areal coverage, toxicity, and impacts to dissolved oxygen, I strongly urge the Division of Water Quality to modify assessment field methods to properly quantify *Microcystis* bloom samples by adding surface film sampling as a standard means to assess chlorophyll *a* biomass when such blooms are visible.

#### References

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**NORTH CAROLINA  
FARM BUREAU FEDERATION, INC.**

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**November 26, 2012**

**Mr. Andy Painter**

**NC Division of Water Quality**

**NC DENR**

**1617 Mail Service Center**

**Raleigh, NC 27699-1617**

**via email: [andy.painter@ncdenr.gov](mailto:andy.painter@ncdenr.gov)**

**Dear Mr. Painter:**

The North Carolina Farm Bureau Federation is the State's largest general farm organization, representing farm and rural interests in North Carolina. This letter is to comment on some aspects of the Division of Water Quality's Use Assessment Methodologies.

**The Fish Consumption Assessment Methodology is fundamentally flawed. It should be omitted from the Use Assessment Methodologies.**

The Fish Consumption Use Assessment Methodology essentially depends on *ad hoc* targets developed by the NC Department of Health and Human Services (DHHS). The use of statewide fish consumption advisories developed by the DHHS effectively circumvents the standards-setting and review process established in §303(c) of the Clean Water Act and the NC Administrative Procedures Act. Impairment decisions should be based solely on duly promulgated water quality criteria. For narrative criteria, only duly adopted translator procedures should be employed.

Another concern with DWQ's use of fish consumption advisories developed by DHHS for identifying impaired waters is that many of the procedural requirements established elsewhere in the Use Assessment Methodology (UAM) are potentially circumvented. For example, the UAM specifies that the "data window/assessment period" for the most recent assessment (2012) included data collected during the period 2006 through 2010. Whether or not DHHS also uses recent data per the period specified in the Methodology for maintaining its consumption advisories is unknown.

The use of recent data is a critical issue for dischargers and non-discharge facilities that have installed new, or modified existing, wastewater treatment facilities. It is also a critical issue for economic development, particularly in NC's distressed counties, all or most of which are rural counties. This is because these counties wish to attract facilities such as food processors and agricultural value-added industries. Having waters declared as impaired projects a negative impression to those wishing to site facilities in NC. Waters should not be declared impaired unless they truly are impaired.

*Farm Bureau and Agriculture...  
We keep North Carolina growing!*

**If the Fish Consumption Assessment Methodology is retained; significant modifications are needed.**

**A. The data used to assess fish tissue concentrations that would potentially trigger the fish consumption advisory must be clearly identified.**

DHHS's fish consumption advisory for mercury illustrates our concerns and supports the basis for this comment. A document is posted on DHHS's website titled "Technical Health Effects of Methylmercury and North Carolina's Advice on Eating Fish." The document is dated 2006 and according to footnotes contained in the document, analyzes fish tissue data collected from 1990 through 2003 [Footnote (g): Mercury Concentrations in NC Fish Tissue Summarized by County 1990-2003. Requested by Dr. Luanne K. Williams with the North Carolina Division of Public Health. Prepared by Mr. Mark Hale with the North Carolina Division of Water Quality"]. However, for DWQ's most recent Use Assessment Methodology (2012), no information has been provided about the quality or age of the fish tissue data used that would support a continuation of the advisory. Based on information presented by NC DENR, mercury air emissions were reduced by 65% from 2003 to 2010. This reduction should have had a profound impact on fish tissue data.

**B. The statistical methods employed to interpret the data should be clearly described.**

In the North Carolina Mercury Total Maximum Daily Load (September 2012), the following statement is made regarding fish tissue assessment: "*To protect water bodies from impairment, the 90th percentile standardized-length Largemouth Bass (LMB) fish tissue total mercury concentration is selected to meet the target level.*" This methodology is not mentioned in the Use Assessment Methodology but clearly should be. In its guidance, EPA strongly recommends that such statistical interpretations be fully explained and included in 303(d) use assessment/listing methodologies, especially if the interpretation becomes the primary basis for listing decisions. Accordingly, the Use Assessment Methodology should be modified to require that DWQ provide access to the specific data and the statistical data evaluation that support impairment decisions.

**C. The Use Assessment Methodology should be consistent with EPA's guidance for assessing mercury in fish tissue.**

EPA has developed guidance for assessing mercury in fish tissue (Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, EPA 823-R-10-001). In that guidance, EPA recommends the following:

"If target populations consume fish from different trophic levels, the state or authorized tribe should consider factoring the consumption by trophic level when computing the average methylmercury concentration in fish tissue. To take this approach, the state or authorized tribe would need some knowledge of the fish species consumed by the general population so that the state or authorized tribe could perform the calculation using only data for fish species that people commonly eat."

We recommend that the assessment methodology for mercury in fish tissue include a trophic level weighted average approach of all fish species actually consumed consistent with EPA guidance.

**D. Fish consumption advisories should be employed for impairment decisions only for water bodies for which segment-specific data justify the advisory.**

In its Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, EPA clearly discourages the use of fish consumption advisories as a basis for impairment decisions without segment-specific data. We recommend that impairment decisions based on fish consumption advisories be avoided unless there is segment-specific data to the support the advisory.

**The Use Assessment Methodology should include a new section describing the process by which a water may be delisted.**

Based on our understanding of federal regulations, waters previously deemed impaired may be removed from the impaired waters list (“delisted”) for good cause. EPA’s good cause factors include: (1) more recent or more accurate data; (2) more sophisticated water quality monitoring; (3) flaws in the original analysis; (4) reassessment of data under the new listing methodology; (5) demonstration that more stringent effluent limitations are in place to produce attainment; (6) demonstration that other pollution control requirements are in place to produce attainment; or (7) demonstration that the impairment is not caused by a pollutant. We recommend that the UAM include explicit decision rules for evaluating these “good cause factors.”

Thank you for the opportunity to provide these comments on the Use Assessment Methodologies. If you have questions, please do not hesitate to contact us.

Sincerely,



Anne Coan  
Director of Environmental Affairs



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

EUGENE A. CONTI, JR.  
SECRETARY

November 26, 2012

Andy Painter  
Planning Section - Division of Water Quality  
North Carolina Department of Environment and Natural Resources  
1617 Mail Service Center  
Raleigh, NC 27699

Subject: NCDOT comments on the 2014 North Carolina draft water quality assessment methodology

Mr. Painter:

Per the NC Division of Water Quality's public comment request, the NC Department of Transportation (NCDOT) appreciates the opportunity to provide comments on the NC water quality assessment methods. Our comments are based primarily on the four documents provided by the Division on its website, the most notable being the 2014 NC Draft Assessment Methodology. NCDOT supports the Environmental Management Commission and the Division of Water Quality in their efforts to manage and protect NC's important water resources and we offer the following comments for your consideration:

1. Regarding the draft aquatic life assessment methodology; Rule 15A NCAC 02B .0202 defines "biological integrity" to mean, "*the ability of an aquatic ecosystem to support and maintain a balanced and indigenous community of organisms having species composition, diversity, population densities and functional organization similar to that of reference conditions.*" Further, Rule 15A NCAC 02B .0205 acknowledges that "*natural waters may on occasion, or temporarily, have characteristics outside the normal range established by the standards*" and states, "*water quality standards will not be considered violated when values outside the normal range are caused by natural conditions.*" The .0202 and .0205 rules refer to 'reference conditions' and 'natural conditions' respectively, however the aquatic life assessment methodology does not provide actionable guidance on how reference and natural conditions are identified and how these two rules integrate into the methodology. NCDOT recommends that the assessment methodology be amended to include a site specific evaluation process for determining aquatic life use support in the face of natural variations in water quality normal for the area. Such an evaluation

process may also support TMDL calculations and EPA's guidance to separate natural background sources of the pollutant of concern from nonpoint sources.

2. Regarding the evaluation of aquatic life support in the context of eutrophication, NCDOT supports the use of biological response variables, such as chlorophyll-a, as one of several factors given consideration. Water quality eutrophication is a complex phenomenon, and as such, any associated aquatic life impacts should be evaluated based on a weight-of-evidence approach which considers multiple parameters, not just one single factor. NCDOT recommends that the assessment methodology be amended to include a holistic, weight-of-evidence approach inclusive of biological response variables, chemical analytical water quality monitoring, and direct fish and benthic community metrics. This weight-of-evidence approach should be coupled with a strong documentation process which clearly records how the aquatic life use support decision was reached.
3. Regarding the action level metals assessment described within the "Toxic Substances" section of the draft aquatic life assessment methodology; NCDOT supports the weight-of-evidence approach proposed for use to determine the aquatic life use support rating based on the action levels of copper and zinc. NCDOT encourages this type of approach for use with other action level parameters that are acknowledged to be generally not bioaccumulative and having variable toxicity to aquatic life.

NCDOT recommends that the assessment methodology clarify the application of Rule 15A NCAC 02B .0211 (4) which states, "*For purposes other than consideration of NPDES permitting of point source discharges as described in this Subparagraph, the Action Levels in this Rule... shall be considered as numerical ambient water quality standards.*" Application of the .0211 (4) Rule is ambiguous with regard to how and when the standard is applied. This ambiguity is particularly acute in cases when a waterbody receives a combination of discharges from NPDES permitted point source wastewater discharges, NPDES permitted point source stormwater discharges, and unpermitted (NPDES) stormwater discharges which by definition are labeled as nonpoint sources.

4. The following four comments: 4a, 4b, 4c, and 4d are based on the general recommendation that waterbodies should only be considered for a category 5 303(d) listing when a pollutant has been identified and its associated water quality standard has been violated and documented. These recommendations are based on the fact that the mass loading of the pollutant cannot be properly calculated for a TMDL in the absence of a pollutant and its associated NC water quality standard.
  - a. Regarding the aquatic life assessment described within the "Ecological/Biological Integrity" section of the draft aquatic life assessment methodology; NCDOT recommends that waterbodies not be listed under category 5 based solely on benthic macroinvertebrate or fish community

metrics (e.g. bioclassification), as these metrics do not identify a pollutant causing the biological impairment. NCDOT does support the use of benthic macroinvertebrate monitoring for aquatic life support use determinations. However, these biological monitoring protocols alone do not provide a sufficient amount of information to warrant a category 5 303(d) listing.

- b. Regarding the advisory posting assessment described within the recreation assessment methodology; NCDOT recommends that waterbodies only be included in a category 5 303(d) listing when a recreation-related pollutant has been identified and its associated water quality standard has been violated and documented. While swimming advisories may be suggestive of a water quality problem, the presence or absence of an advisory is not sufficient as the sole basis for a category 5 303(d) listing, as the criteria for posting the advisory may differ from NC's water quality standards.
- c. Regarding the Division of Marine Fisheries (DMF) Shellfish Sanitation growing area classification assessment described within the shellfish harvesting assessment methodology; for reasons similar to those in comment 4b above, NCDOT recommends that a category 5 listing for a shellfish harvesting impairment only be made when a pollutant has been identified and its associated NC water quality standard has been violated. The assessment methodology should be amended to recognize that the DMF, which has the authority to close waters to harvesting, operates its program based on federal criteria. DMF's program is not based on NC waterbody classifications, standards, and policy established by the Environmental Management Commission. Hence, there can be instances when a closure is not indicative of a NC fecal coliform standards violation. For example, DMF has the authority to close a waterbody to harvesting based solely on administrative reasons, such as federal regulations which require the DMF to prohibit harvesting if the agency decides to stop water quality monitoring operations within a given waterbody. Such reasons may have nothing to do with violations of NC water quality standards. While many DMF closures are suggestive of degraded water quality, the posting alone is not sufficient justification for a category 5 listing.
- d. Regarding the fish consumption assessment methodology; NCDOT recommends that a reevaluation be conducted on the blanket category 5 listing of all waters in NC due solely to fish consumption advice from the Department of Health and Human Services. This reevaluation should include an analysis of whether water quality standards have been violated for a given pollutant within a specific waterbody. If so, then a category 5 listing for the pollutant of concern may be appropriate for that particular monitored waterbody. If there is insufficient data to assess the fish consumption use then the waterbody should be given a 'not rated' rating.

Please do not hesitate to contact me at (919) 707-6737 or [amcdaniel@ncdot.gov](mailto:amcdaniel@ncdot.gov) with any questions concerning these comments.

Sincerely,

A handwritten signature in cursive script that reads "Andrew McDaniel".

Andrew McDaniel, PE  
NCDOT Highway Stormwater Program

Cc: David Chang, NCDOT  
Ken Pace, NCDOT  
Pam Behm, DWQ  
Kathy Stecker, DWQ



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November 26, 2012

Mr. Andy Painter, Environmental Scientist  
Division of Water Quality  
NC Department of Environment and Natural Resources  
1617 Mail Service Center  
Raleigh, NC 27699-1617

Dear Mr. Painter,

The NC League of Municipalities is a membership organization of over 550 municipalities and affiliate organizations, many of which are impacted by decisions made throughout the process of developing the state's impaired waters list, or 303(d) list. The League's member cities, towns, and affiliates therefore appreciate the opportunity to comment on the "use assessment methodology" employed by the state to direct the evaluation and listing of waters on the state's 303(d) list.

League members have a prime responsibility for implementing the requirements of the federal Clean Water Act (CWA). As a result, they understand first-hand the significance of decisions made in listing waters on the 303(d) list, because many cities and towns have operations with wastewater and stormwater discharges to these "listed," impaired waters. The consequences of listing a water body as impaired can be dramatic, as the CWA requires development of a Total Maximum Daily Load (TMDL) in response to any listing. A TMDL is then implemented through discharge permits issued in accordance with the National Pollutant Discharge Elimination System (NPDES) program. Because all municipalities that offer wastewater treatment or manage a municipal separate storm sewer system hold NPDES permits, they must adhere to any additional, TMDL-related permit conditions. Those cities and towns must also ensure they have the necessary financing to address the added permit terms, a process which takes time and planning in consultation with the city or town's governing board.

In this way, municipal water quality professionals work diligently and cooperatively with the state to address water body impairments in North Carolina. With respect to the initial listing decisions made pursuant to the use assessment methodology, League members support the revisions proposed below.

Respectfully submitted,

A handwritten signature in black ink that reads "Erin L. Wynia".

Erin L. Wynia  
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## **General Comments**

North Carolina's "use assessment methodology" sits at the core of a key regulatory process to implement the CWA, the 303(d) listing process. The use assessment methodology stands as the key decision-making mechanism used by DWQ to evaluate the health of the state's surface waters. Simply, the methodology describes the process DWQ uses to evaluate waters and make listing decisions.

These comments first list four areas of general comments: (1) role of agency judgment; (2) need for decision details; (3) desire for flexibility; and (4) basis for "delisting."

***Role of agency judgment.*** The current methodology takes an almost robotic approach to listing decisions, directing DWQ staff to compare water quality data to the standard and automatically assigning a listing category for that water body. A major shortcoming of this process is that it does not allow for consideration of further information in the case of listing decisions with large regulatory consequences. In other words, this cut-and-dry approach does not clearly reflect the complexity of determining the relationship between water quality data *and the ability of a stream to support its uses*, along with the resulting regulatory measures needed to realize a change in water quality.

To facilitate these complicated decisions, the methodology needs an increased avenue for "best professional judgment" in making listing decisions. Ideally, such discretion would enable DWQ to analyze the extent of the water quality impairment, judge how water quality impacts relate to the use of the waters, and consider the implications of its assessments. For example, if there is data or information that supports the conclusion that a water body meets its intended use *despite* exceeding standards, DWQ staff should take that additional information into account when making listing decisions. League members support an expansion of the methodology to include a more complete description of the staff deliberations on listing decisions and to establish reasonable "best professional judgment" guidelines.

***Need for decision details.*** In addition, to understand any listing decision, the interested public must translate the process outlined in the methodology and apply available data to the specific water body of concern. The current methodology does not require an explanation of how and why water bodies are placed on the 303(d) list. Such an explanation, particularly if a listing decision requires the agency to apply its best professional judgment, should be provided with each listing decision. Otherwise, without knowing the reasons behind a listing decision, the public has limited ability to engage in a useful dialogue about why a water body was listed. The current lack of detail also hinders the public's ability to develop an alternate consideration of the listing. Therefore, League members support a requirement in the methodology for a written explanation to accompany each listing decision. The explanation should include all pertinent information that informed the listing decision.

***Desire for flexibility.*** The specific statutory language directing states to "list" impaired waters states:

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(d)(1)(A) Each State shall identify those waters within its boundaries for which the effluent limitations required...are not stringent enough to implement any water quality standard applicable to such waters. The State shall establish a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters (*emphasis added*).

The underlined language above provides DWQ the legal authority to exercise a degree of discretion when evaluating available stream data. However, North Carolina's current methodology contains little flexibility for listing decisions.

In contrast, before listing waters on the 303(d) list, the methodologies followed by other EPA Region 4 states provide a process for further evaluation of water bodies that indicate impairment. For example, some of these methodologies describe the development of a planning list of waters that require additional evaluation – and in some cases additional data – before a water body is determined to be impaired. In another example, Florida requires additional clarification of a potential impairment decision based on the number of samples available for a particular criterion. With a few exceptions, North Carolina's proposed 2014 methodology generally fails to provide any kind of further evaluation process, as long as DWQ has the minimum number of samples available for a particular water body.

The ways other Region 4 states address mercury impairments provide another example of the significant flexibility for state agencies when making impairment decisions. According to DWQ, both North Carolina and Kentucky have statewide fish consumption advisories for mercury; North Carolina's advisory is specific to one species of fish, and Kentucky's advisory is for all freshwater fish species. While Kentucky's broader advisory might lead to the conclusion that it would have more waters listed as impaired for mercury, in fact, Kentucky's methodology directs a listing for mercury only when a water body has a site-specific advisory in place. North Carolina, in its mechanistic approach to listing decisions, listed every water body in the state as impaired for mercury based on its statewide fish consumption advisory. This difference in listing decisions implies that the CWA allows for significant flexibility when making these determinations.

League members support allowances in the methodology for increased flexibility when making listing decisions. Such flexibility will allow for a more rigorous evaluation of impairment decisions while allowing DWQ to exercise good public policy judgment with these decisions. Especially when a decision can affect a large watershed, as is often the case with chlorophyll *a* listings, giving a water body the status of "further evaluation" before making a final listing decision seems judicious.

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***Basis for “delisting.”*** The proposed 2014 draft methodology does not provide a basis for “delisting” waters for good and specific cause, including if mistakes have been made in previous listings or a study has reevaluated the waters and points to non-impairment. League members support including a delisting process in future methodologies.

### **Specific Comments**

The following specific comments expand upon these general comments offered above.

**Assessment Units and Water Quality Classifications.** This section of the methodology describes the scope of stream segments evaluated for impairment status. Its language, however, trends toward over-inclusiveness when making listing decisions. Such over-inclusiveness does not allow room for best professional judgments regarding whether a water body meets its intended uses, even if exhibiting excursions from water quality standards.

Specifically, this section states that while water bodies are evaluated by discrete stream lengths called “assessment units,” solutions to impairments “typically encompass entire watersheds.” This overly broad statement belies DWQ’s current approach to listing decisions, which favors the application of a minimum amount of data to the maximum number of streams that can be sampled. The broad statement also ignores situations in which a water body with (1) measured excursions from water quality standards and (2) impacted uses may benefit from controls on nearby sources rather than watershed-scale solutions. A more effective approach to addressing water body impairments should come through tailoring the necessary control measures to the specific identified impairment.

In addition, to more effectively target the most problematic impairments, this section of the methodology should describe a priority-setting process for evaluating the state’s streams. Other EPA Region 4 states, such as Kentucky and Tennessee, utilize a five-year cycle to rotate through the state’s river basins for sampling and monitoring of water bodies. While each state still receives samples and data from other sites around the state from other agencies and the public each year, the state’s water body monitoring efforts concentrate on that year’s priority river basins.

**Data Window.** This section of the methodology describes the time period from which DWQ can utilize data in making listing decisions. The League suggests an improvement to this procedure for evaluation of waters under two unusual circumstances.

First, in the case of water bodies listed on the basis of data collected in a previous assessment period, the League suggests instituting additional monitoring plans for these stream segments. An existing non-support determination based on information from a past assessment period should not be used to

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continue that listing if there is any indication that conditions have changed due to efforts to correct the issue, or if data indicate that environmental conditions have changed.

Second, other circumstances may warrant further monitoring before continuing a listing decision. These circumstances include data collected under extreme conditions such as drought or elevated temperatures. They may also include instances where parties have made specific efforts to address water quality problems since the last sampling period. As described above in “General Comments,” the CWA allows for this flexibility to conduct additional sampling to ensure that states make listing decisions based on the best available information.

**Data Availability and Quality.** This section of the methodology invites the submission of data by various parties, including local governments. However, it provides no detail to direct an interested party on how to develop an appropriate Quality Assurance Project Plan or data that can be used to supplement the current DWQ database. This section of the methodology should include such detail, thereby allowing interested parties that are materially affected by the listing of a water body to provide their own data for consideration in the listing process.

**Use Support Categories and Water Quality Standards.** Despite the title of this section, the methodology does not clearly define the state’s use support categories. The League suggests filling out this section of the methodology with detail on the use support categories.

**Aquatic Life Assessment Methodology – Numerical Water Quality Standards.** This section of the methodology mentions “a category 1 listing.” However, the methodology does not define the 303(d) list categories. This level of detail would assist the public in understanding the consequences of listing decisions.

This section also states a threshold of “10% of samples exceed the numerical standard” for categorization of a water body as impaired. However, the methodology does not indicate the basis for this threshold. Given that this threshold is critical to impairment determinations, DWQ should strive to explain the reasoning behind selecting the 10% figure. The methodology also does not offer reasons to consider a different threshold from the 10% figure. One such reason is the need to apply best professional judgment and evaluate data more completely within the environmental, seasonal, or flow variations under which it was collected.

**Aquatic Life Assessment Methodology –Swamp Water Dissolved Oxygen (DO) Assessment (Secondary Class Sw).** This section of the methodology provides a mechanism to consider waters that are “swamp like,” but provides no information on how DWQ would identify these waters. Such detail would strengthen the public’s understanding of listing decisions.

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**Aquatic Life Assessment Methodology – pH.** This section of the methodology gives an allowance to agency decision-makers if waters have low pH levels as a “result of natural conditions.” Implying that a listing decision may include some degree of best professional judgment, this section does not however describe how this discretion may be exercised. A more detailed explanation of the natural conditions creating low pH would again assist in the public’s understanding of listing decisions in this area.

**Aquatic Life Assessment Methodology – Chlorophyll  $\alpha$  Standard; Chlorophyll  $\alpha$  Standards Assessment.** These two sections represent listing categories addressing the complex water quality issue of nutrient impairment. Given the potential for large impacts to the permitted community discharging to waters impaired by chlorophyll  $\alpha$ , the League recommends significantly expanding this section to incorporate principles learned during the May 29-30 N.C. Forum on Nutrient Over-Enrichment. The League also recommends expansion of this section to allow for a more full evaluation of eutrophication issues before making a use support determination, utilizing the principles of flexibility and best professional judgment as discussed in the “General Comments” section above.

Importantly, the methodology should require a more involved study and analysis before making listing decisions based on chlorophyll  $\alpha$ . The current procedure of making a listing decision on the basis of ten samples alone is not sufficient with listing decisions of this magnitude. Such deliberation at the front end of the process for managing nutrients will instill more confidence in the outcome and ensure that the decision is made on the basis of sound data.

**Toxic Substances – Toxic Substances and Action Level Metals Assessment.** This section references the ongoing triennial review of metals standards. We note that once those standards are finalized, this methodology will likely need updating as well.

Further, this section outlines a process by which a “water quality assessment team” evaluates copper and zinc data against eleven factors. To assist permittees that are affected by a listing decision that would result in a TMDL, the League suggests that the methodology direct a staff evaluation of how these factors were applied for the affected permittee’s specific circumstance.

**Turbidity – Turbidity Assessment.** This section of the methodology mentions that “natural background conditions” could affect turbidity, yet does not provide any description of how DWQ might evaluate these natural background conditions. Including such description will assist the public in better understanding listing decisions made on the basis of turbidity.

**Shellfish Harvesting Assessment Methodology – DMF Shellfish Sanitation Growing Area Classification Assessment.** This section of the methodology references data collected by the N.C. Division of Marine

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Fisheries (DMF). However, the methodology does not discuss how DMF classifies growing areas and does not reference DMF's own methodology. Because DWQ's assessment must be based on its own methodology, rather than a resource agency's determination of "prohibited" or "conditionally approved" growing areas, the League suggests including DMF's methodology in this section. Only if DMF's classifications are based on the same factors as DWQ's would using the DMF classification as a basis for a listing decision adhere to the CWA.

**Fish Consumption Assessment Methodology – Mercury Assessment Criteria.** This section of the methodology allows for listings based on a fish consumption advisory issued by the N.C. Department of Health and Human Services (DHHS). However, the criteria used by DHHS to establish advisories, like shellfish harvests, includes factors like "risk," which may or may not be based on current science and established evaluation factors used by DWQ to characterize the pollutant content of fish tissue. In fact, some public health guidelines developed by non-water quality agencies like DHHS may be more restrictive than established or approved EPA guidance because the public health agencies have decided to provide a lower risk potential. Therefore, those decisions may not reflect appropriate CWA standards or be a basis for impairment.

The League recommends revising this section of the methodology to direct a case-by-case determination of mercury impairment in specific stream segments, rather than a general statewide approach.



**Guardians of North Carolina's Water and Health  
from the Mountains to the Sea**

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November 26, 2012

Re: Comments on the 2014 North Carolina Draft Assessment Methodology

Dear Mr. Painter:

Thank you for the opportunity to comment on the North Carolina Division of Water Quality ('DWQ') proposed methodology for assessing water quality impairments in accordance with section 303(d) of the federal Clean Water Act ("CWA"), 33 U.S.C. § 1313(d). These comments are submitted by WATERKEEPER® ALLIANCE ("WKA") and WATERKEEPERS® CAROLINA ("WKC"), an umbrella group that represents all ten Waterkeeper programs in North Carolina, including the Cape Fear RIVERKEEPER®, Catawba RIVERKEEPER®, French Broad RIVERKEEPER®, Haw RIVERKEEPER®, Pamlico-Tar RIVERKEEPER®, Upper & Lower Neuse RIVERKEEPERS®, Waccamaw RIVERKEEPER®, Watauga RIVERKEEPER®, White Oak New RIVERKEEPER®, and Yadkin RIVERKEEPER®.

States are required under section 303(d)(1) of the CWA to identify all waters within their boundaries for which effluent limitations or other pollution controls required by state or federal law are not stringent enough to implement any water quality standards applicable to such waters. 40 C.F.R. §130.7(b)(1). These waters are referred to as "water quality limited-segments" and are required to be included on what is commonly referred to as the state's 303(d) List. *Id.* A water quality limited-segment is defined as "[a]ny segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards . . . ." 40 C.F.R. §130.2(j). States are required to list both those waters that are already impaired and those waterbodies where water quality is threatened.

When listing water quality-limited segments under section 303(d), the states are required to assess whether the waters are meeting all water quality standards established under section 303 of the CWA for that waterbody, including numeric criteria, narrative criteria and anti-degradation requirements. 40 C.F.R. §130.7(b)(3). With limited exceptions, states must identify all waters not meeting any one of these components of water quality standards on the 303(d).<sup>1</sup>

According to 2012 U.S. EPA Integrated Report Guidance, "[a]ntidegradation is an integral component of a State water quality standard (i.e., designated uses; criteria to

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<sup>1</sup> Guidance for Water Quality-Based Decisions: The TMDL Process, ch. 2 (U.S. EPA 1991).  
[http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/decisions\\_index.cfm](http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/decisions_index.cfm)

meet those uses; and antidegradation policies) that focuses on maintaining and protecting the chemical, physical, and biological integrity of the nation's waters, consistent with the CWA and its implementing regulations."<sup>2</sup> The EPA Guidance further states that "[b]y assessing waters in this manner, there is a greater opportunity to protect human health and wildlife values, achieve healthy watersheds, and fulfill in a more cost-effective manner the CWA's primary objective to restore and maintain the nation's waters."<sup>3</sup> With regard to antidegradation assessment, "[i]dentification of threatened good quality waters is an important part of this approach. Adequate control of new discharges from either point or nonpoint sources should be a high priority for States to maintain the existing use or uses of these waterbodies. In the identification of threatened waters it is important that the 303(d) process consider the water quality standards program to ensure that a State's antidegradation policies as established in State law are followed."<sup>4</sup>

In assessing whether a waterbody is meeting all applicable numeric criteria, narrative criteria and anti-degradation requirements, the state is required to "assemble and evaluate all existing and readily available water quality-related data and information . . . ." C.F.R. §130.7(b)(5). This includes, but is not limited to, information on water quality impairments or threats identified on the most recent 305(b) list; through modeling; information reported by agencies, the public or academic institutions; and CWA section 319 nonpoint source reports. *Id.* States must also consider any other water quality-related data and information that is existing and readily available as described in EPA's 1991 *Guidance for Water Quality-Based Decisions*, Appendix C.<sup>5</sup>

The 303(d) List must also include a priority ranking for "all listed water quality-limited segments still requiring TMDLs, taking into account the severity of the pollution and the uses to be made of such waters and shall identify the pollutants causing or expected to cause violations of the applicable water quality standards." 40 C.F.R. §130.7(b)(1). The priority ranking must specifically include the identification of waters targeted for TMDL development in the next two years. *Id.* The section 303(d) listing requirement applies to water quality limited-segments impaired by pollutant loadings from both point and/or nonpoint sources. The 303(d) List must be submitted to EPA for approval or disapproval and must include documentation to support listing decisions, including a description of the listing methodology, a description of the data/information used to support the decision, rationale for not using available data and information, and any other information requested by the Region.

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<sup>2</sup> Information Concerning 2012 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions, p. 7 (U.S. EPA March 21, 2011).

[http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/upload/final\\_2012\\_memo\\_document.pdf](http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/upload/final_2012_memo_document.pdf)

<sup>3</sup> *Id.*

<sup>4</sup> Guidance for Water Quality-Based Decisions: The TMDL Process, ch. 2 (U.S. EPA 1991). [http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/decisions\\_index.cfm](http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/decisions_index.cfm)

<sup>5</sup> Guidance for Water Quality-Based Decisions: The TMDL Process, ch. 2 (U.S. EPA 1991). [http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/decisions\\_index.cfm](http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/decisions_index.cfm)



The EPA recommends the use of five categories to classify the water quality standard attainment status for each waterbody segment, or assessment unit.<sup>6</sup> The categories are as follows:

- Category 1: All designated uses are supported, no use is threatened;
- Category 2: Available data and/or information indicate that some, but not all of the designated uses are supported;
- Category 3: There is insufficient available data and/or information to make a use support determination;
- Category 4: Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed because:
  - 4a - A TMDL to address a specific segment/pollutant combination has been approved or established by the EPA.
  - 4b - A use impairment caused by a pollutant is being addressed by the state through other pollution control requirements.
  - 4c - A use is impaired, but the impairment is not caused by a pollutant.
- Category 5: Available data and/or information indicate that at least one designated use is not being supported or is threatened, and a TMDL is needed.

States must develop assessment methodologies for evaluating if water quality does not meet applicable water quality standards or is not expected to meet applicable water quality standards, i.e. whether water quality is threatened or impaired. According to the EPA:

The assessment methodology constitutes the decision process (including principles of science, statistics and logic used in interpreting data and information relevant to segment conditions) that a state employs to determine to which of the five integrated reporting categories a segment belongs. It is important that assessment methodologies must be consistent with applicable WQSs. They should also be consistent with sound science and statistics.<sup>7</sup>

State assessment methodologies should include a standard for classifying the attainment status of each waterbody segment and assigning a waterbody to a particular category, as well as a description of the categories used by the agency.

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<sup>6</sup> 2006 Integrated Water Quality Monitoring and Assessment Report Guidance, (U.S. EPA July 29, 2005). <http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/upload/2006irg-report.pdf>

<sup>7</sup> Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, p. 29 (U.S. EPA July 29, 2005). <http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/upload/2006irg-report.pdf>

Additionally, the methodology should:

1) explain how the state identifies, considers (evaluates) all existing and readily available data and information; 2) articulate the basics of the quality assurance and quality control (QA/QC) criteria used to evaluate data submitted by outside entities to determine what weight, if any, should be assigned to said data and information; and 3) explain the analytical approaches, including statistical analyses, used to infer true segment conditions from all valid existing and readily available information. The decision processes the states describe in the methodology should provide all stakeholders with the opportunity to understand exactly how assessment decisions are made.<sup>8</sup>

The assessment methodology should address data quality, representativeness, and quantity considerations.<sup>9</sup> According to 2010 EPA Guidance,<sup>10</sup> “[s]tates should clearly explain their rationale for setting minimum data quantity thresholds in their assessment methodologies, and should describe how they consider data sets that do not meet these thresholds.” Further, states should clearly identify any policy decisions imbedded in their assessment methodologies, such as whether the state assumes a waterbody meets water quality standard in the absence of some expressly identified level of credible evidence and how waterbodies are selected for assessment.

### **The Methodology Does Not Assess all Applicable Water Quality Standards**

North Carolina’s 2014 Proposed Assessment Methodology (“Assessment Methodology”) does not meet these basic requirements in several respects. As an initial matter, the methodology does not include protocol for assessing all water quality standards applicable to North Carolina waters. For example, the Assessment Methodology only refers to narrative and numeric water quality standards generally and states that assessments “are based on the standards and data availability for the applicable use support category- aquatic life, recreation etc.” Assessment Methodology at p. 4. There is no mention of the antidegradation requirements in 15A NCAC 02B .0201, 15A NCAC 02B .0224 and 15A NCAC 02B .0225, and there are no procedures for evaluating whether antidegradation standards are violated or likely to be violated.

With regard to toxic substances, the Assessment Methodology only provides for evaluation of certain numeric criteria for aquatic life and fish consumption. However, North Carolina has additional water quality standards applicable to toxic substances, including additional numeric and narrative standards that are not addressed in the methodology. For example, in 15A NCAC 02B .0208, there is a narrative standard that provides that “the concentration of toxic substances, either alone or in combination with other wastes, in surface waters shall not render waters injurious to aquatic life or wildlife, recreational activities, public health, or impair the waters for any designated uses.” The Proposed Assessment Methodology should include methods to assess all of the

<sup>8</sup> Id.

<sup>9</sup> Id. at 32-37.

<sup>10</sup> Information Concerning 2010 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions, (U.S. EPA May 5, 2009).  
<http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/final52009.cfm#memo>

narrative and numeric criteria in 15A NCAC 02B .0208, as well as all of the numeric and narrative criteria for toxics in 15A NCAC 02B .0211 and 0220.

The water quality standards also provide that “waters shall be suitable for aquatic life propagation and maintenance of biological integrity, wildlife, secondary recreation, and agriculture. Sources of water pollution which preclude any of these uses on either a short-term or long-term basis shall be considered to be violating a water quality standard.” See 15A NCAC 02B .0211. However, the Proposed Assessment Methodology only includes a method for assessment of fish and benthic communities to evaluate whether this standard is met and there is no apparent evaluation of short vs. long-term impairment. This method is inadequate to determine whether the waters are suited for aquatic life and to maintain biological integrity, wildlife, secondary recreation, and agriculture. Additionally, there are a large number of narrative and numeric standards applicable to Class C waters in 15A NCAC 02B .0211 and Class SC Waters in 15A NCAC 02B .0220 that are not included in the Assessment Methodology, including solids and sludges, gases, oil, deleterious substances, phenolic substances, radioactive substances, and a large number of numerical criteria for toxics.

With regard to WSI-WSV (Water Supply) Watersheds, almost none of the applicable narrative and numeric standards are addressed in the Assessment Methodology. Rather, the entire assessment methodology is based on assessment of eight numeric criteria. Assessment Methodology, pp. 12-13. The number and nature of the numeric and narrative standards that are required to be addressed in the Assessment Methodology, but which are not included, are far too numerous to list herein. This is a serious problem because most of these water quality standards are designed to protect human health in public drinking water supplies.

With regard to Recreation, a methodology is only provided for the numeric criteria and a minimum sample number requirement is added to the 400 col./100 ml standard for fecal coliform contrary to the actual water quality standard in 15A NCAC 02B .0219, as well as the purpose of that standard which is to protect human health from unsafe, extremely high levels of bacteria in recreational waters. A separate standard exists to evaluate average conditions. No provision is made to list waters for extreme and recurrent exceedences of any of the bacteria standards though this type of water quality impairment in recreational waters is well-documented throughout North Carolina and presents a serious threat to human health. Additionally, no methodology is included to address the narrative standards in 15A NCAC 02B .0219 and 15A NCAC 02B .0222.

With regard to Class SA Waters (Shellfish Harvesting), the Assessment Methodology does not include a methodology for assessing either the numeric or the narrative criteria set forth in 15A NCAC 02B .0221. The method expressly provides that fecal coliform data is not evaluated despite the fact that a numeric water quality standard for fecal coliform is the primary applicable standard. While it is appropriate to list a water as impaired if it is closed to shellfish harvesting, the Assessment Methodology must also include a method for addressing the actual water quality standards applicable to the waters and determine whether water quality is impaired or threatened.

Lastly, there are no assessment methodologies proposed that relate in any way to evaluation of the water quality standards applicable to designating Nutrient Sensitive Waters or to the Nutrient Management Strategies for certain designated watersheds.

### **The Assessment Methodology is not Consistent with Minimum Legal Requirements and EPA Guidance**

In addition to the failure to include assessment methodologies for all applicable water quality standards, the Assessment Methodology does not appear to contain any protocol for evaluating whether a waterbody is threatened. The DWQ is required to evaluate and list waterbodies that are violating or expected to violate any applicable water quality standard and, in order to do so, it must develop and apply assessment methodologies that identify impairments and threats based on all narrative, numeric and antidegradation standards.

Further, the Assessment Methodology does not describe adequately and fully describe the decisionmaking process that DWQ will follow in making its listing decisions. For example, it does not describe how data will be collected or evaluated, how waterbodies will be prioritized, the standards by which waters will be determined to fall into which category, the required QA/QC process for data, how multiple data sets will be analyzed, the criteria for acceptance or rejection of data, standards for representativeness, or the rationale for minimum data requirements. Assessment methods must be consistent with actual water quality standards but many of the proposed methods simply require a minimum of 10 samples or 10% exceedance without regard to the nature, magnitude of exceedance or actual text of the water quality standard.

Assessment methodologies should not establish statewide minimum sample number or exceedance requirements for all criteria. The 2006 EPA Guidance provides that:

EPA is particularly concerned with application of such thresholds statewide, without regard to key factors like the manner in which applicable WQC are expressed, variability in segment-specific conditions, and fluctuations in rates of pollutant loading. Rather if employed, target sample set sizes should not be applied in an assessment methodology as absolute exclusionary rules, and even the smallest data sets should be evaluated and, in appropriate circumstances, used . . . Any target sample set size thresholds must be consistent with the state's EPA-approved water quality standards. Hence, when making a determination based on comparison of ambient data and other information to a numeric WQC expressed as an "average" concentration over a specified period of time, a statement of a desired number of samples may be appropriate. Still, the methodology should provide decision rules for concluding nonattainment in cases where the target data quantity expectations are not met, but the available data and information indicate a reasonable likelihood of a WQC exceedance . . ."<sup>11</sup>

Minimum sample sizes should be based on the water quality standard being assessed and exceptions to minimum sample sizes should be allowed. Further, it is not appropriate to apply an across the board percent exceedance standard to all water quality standards unless its application is consistent with the manner in which the criteria are expressed, i.e. the methodology must reflect the actual standard. The 2006 EPA Guidance provides that "use of the ten percent rule for interpreting water quality data is

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<sup>11</sup> Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, p. 37 (U.S. EPA July 29, 2005).  
<http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/upload/2006irg-report.pdf>

usually not consistent with WQC expressed either as: 1) instantaneous maxima not to be surpassed at any time, or 2) average concentrations over specified times.”<sup>12</sup>

The Assessment Methodology should also, but does not, allow for listing due to unusual or infrequent exceedances of water quality standards. This is especially true for toxics and bacteria that can have serious effects on human health when present in recreational and drinking waters at high levels during short-term events. According the 2006 EPA Guidance:

In assessing potential adverse effects on humans or other life forms, it is just as important to be cognizant of potential short-term events as it is to reflect longer term “average” conditions. Short-term exposure to very high levels of pollutants (or low level of necessary elements like oxygen) can be extremely harmful, even lethal. For this reason, EPA and state WQC for a number of pollutants include concentration/duration combinations for short periods as well as such combinations for longer periods . . . Extreme values or “outliers” can be very relevant when dealing with WQC aimed at protecting humans or other life forms against adverse effects of acute (short term) exposure to pollutants. The fact that such values may occur fairly infrequently and are not representative of long-term average conditions is unimportant when dealing with WQC expressed as short-term that should occur only rarely, if ever. EPA’s WQC addressing acute exposure of freshwater aquatic life to toxic chemicals are an example of WQC expressed in this way – they are one-hour average concentrations that should be surpassed no more than once every three years on average. WQC expressed as instantaneous concentrations never to be surpassed address even more rare, but nevertheless harmful, conditions.<sup>13</sup>

The Assessment Methodology should be revised to address both short-term and long-term average conditions where the standards are intended to address one or both situations.

According to the Assessment Methodology, the “data window for the 2014 Water Quality Use Assessment (303d and 305(b) Integrated Reporting) includes data collected in calendar years 2008 through 2012 (five years).” Assessment Methodology, p. 3. The 2006 EPA Guidance states that:

While some older data may not be representative of current water quality conditions, especially for pollutants that exhibit shorter-term effects, EPA believes that data should not be treated as unrepresentative of water quality conditions solely on the basis of age. Older data and information

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<sup>12</sup> Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, p. 40 (U.S. EPA July 29, 2005).

<http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/upload/2006irg-report.pdf>

<sup>13</sup> Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, p. 35 (U.S. EPA July 29, 2005).

<http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/upload/2006irg-report.pdf>

should be considered unless supporting information indicates that the data are not representative of current conditions.<sup>14</sup>

The Assessment Methodology should be revised to require consideration of older data unless such information is determined by other information not to be representative of current conditions.

In its review of the North Carolina's 2012 303(d) List, the EPA determined that the listing methodology employed was "overly restrictive" and conducted its own data review.<sup>15</sup> The 2014 Assessment Methodology indicates that it has not been altered from the 2012 version. In particular, the EPA rejected the age limitation on data and the minimum sample number approach taken in the Assessment Methodology. EPA stated that the state "should revise its methodology to allow consideration of older data and data contained within smaller data sets for future section 303(d) lists." Additional issues with the methodology identified by EPA that should be addressed in this revision of the Assessment Methodology are as follows:

- Waterbodies with low D.O. and pH that were identified as being due to natural conditions could be included in Category 3, but should be prioritized for follow-up monitoring to confirm the accuracy of the approach. This approach is continued in the 2014 Guidance without any provision for additional analysis.
- "For toxic pollutants, EPA guidance recommends use of one-exceedance-in-three-years frequency for listing decisions. A state may use an alternative methodology to assess waters where the state has provided a scientifically defensible rationale that its methodology is no less stringent than the EPA's recommended water quality standards . . . The EPA has reviewed the justification North Carolina submitted supporting its listing methodology for toxic and non-conventional pollutants and does not believe the State has demonstrated that the ten percent frequency methodology for toxics is no less stringent than the 1-in-3 frequency methodology recommended in the EPA's assessment guidance." EPA did not expressly direct DWQ to revise this but impliedly did so by rejecting the methodology and conducting its own analysis of the available data.
- With regard to copper, zinc and other toxics, the EPA stated that "DWQ did not provide sufficient information to show that the proposed combination of biological and chemical methods were protective. While the EPA supports the use of an approach with multiple lines of evidence, DWQ's proposal placed an exceedingly high value on biological assessment over chemical data . . . the EPA has not determined that DWQ's methodology is a reasonable method to assess toxic pollutants . . . High priority follow-up monitoring during the next listing cycle is recommended for the waterbodies identified as potentially impaired for copper and zinc. Monitoring and assessment of those and all waterbodies must be

<sup>14</sup> Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, p. 35 (U.S. EPA July 29, 2005).

<http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/upload/2006irg-report.pdf>

<sup>15</sup> EPA Decision Document for the Partial Approval of the North Carolina Department of Environment and Natural Resources 2012 Section 303(d) List, (U.S. EPA August 9, 2012).

[http://portal.ncdenr.org/c/document\\_library/get\\_file?uuid=4f002060-a014-428b-b504-c1bf1387d752&groupId=38364](http://portal.ncdenr.org/c/document_library/get_file?uuid=4f002060-a014-428b-b504-c1bf1387d752&groupId=38364)

based on North Carolina's EPA-approved water quality standards that might include any revised metals standards that have been approved by the EPA prior to the next listing cycle. As discussed earlier in this section, the EPA has not determined that use of the "> 10% exceedence" test is a reasonable method for DWQ to assess toxic or non-conventional pollutants consistent with the State's currently applicable, EPA-approved water quality standards." The 2014 Assessment Methodology is based on the same approach rejected by the EPA in 2012 and must be revised.

- The fish consumption methodology should allow for listing decisions on a case-by-case basis, as well as based on fish tissue data and consumption advisories. Further "[t]he EPA does not agree that provisions in the State's methodology related to age of data and minimum sample size are consistent with federal requirements. Also, for the reasons set out in the section addressing assessment of section III.A.4.e above, the EPA has not determined that use of the "> 10% exceedence" test is a reasonable method for DWQ to assess toxic or non-conventional pollutants such as mercury." Although it was not addressed by the EPA, as noted above, the 2014 Guidance does not include methodologies for all of the water quality standards that apply to fish consumption but only PCBs, Dioxin and Mercury. Assessment Methodologies for each standard applicable to fish consumption should be included.
- With regard to Recreation bacteria assessment methodologies, the EPA stated that it "does not agree that provisions in the State's methodology related to age of data and minimum sample size are consistent with federal requirements."
- With regard to Drinking Water assessment, the EPA noted that no methodology was available for a long list of water quality standards and expressed that it does not agree with the data age, minimum sample size and 10% exceedence portions of the methodology. The EPA also noted that North Carolina did not have assessment methodologies for a large number of applicable water quality standards.

The 2014 Assessment Methodology should be revised to address all of the issues mentioned in these comments and the issues identified by EPA in its review of the 2012 303(d) List. Thank you for the opportunity to comment on this proposal.

If you have any questions, you may contact Kelly Foster at [kfoster@waterkeeper.org](mailto:kfoster@waterkeeper.org) or Erin Riggs at [erinr@ptrf.org](mailto:erinr@ptrf.org).

Sincerely,

Kelly Hunter Foster  
Senior Attorney  
Waterkeeper Alliance

Erin Riggs  
Associate Executive Director  
Waterkeepers Carolina

**The following email was sent to Alan Clark, but has been included in the comments. Original text not relating to the assessment methodology has been removed from this email.**

**From:** Steve Tedder [<mailto:tedderfarmconsulting@gmail.com>]  
**Sent:** Monday, December 03, 2012 6:55 AM  
**To:** Clark, Alan  
**Subject:**

Alan,

...just want to mention again one issue that I think would strengthen the methodology substantially, the use of confidence levels to ensure data validity for its intended use. I really think we need to build in a 90-95 % confidence level as we take listing actions on data. We need that level of confidence that the 10% or whatever % us used, actually exceeds the standards.

I know the following is utilized in the Environmental Sciences basin documents and I think this is a wise measure to utilize associated with the data gathered:

This document uses a nonparametric procedure (Lin *et al.* 2000) to identify when a sufficient number of exceedances have occurred that indicate a true exceedance probability of 10 percent. Calculating the minimum number of exceedances needed for a particular sample size was done using the BINOMDIST function in Microsoft Excel. This statistical function suggests that at least three exceedances need to be observed in a sample of 10 in order to be [about] 95 percent confident that the results statistically exceed the water quality standard more than 10% of the time. For example, there is less statistical confidence associated with a 1 exceedance out of 10 (74 percent) than when there are 3 exceedances out of 10 (99 percent confidence). They also consider ambient background conditions including seasonal and other natural variations.

The other issue that is worth evaluating is that of the 10% criteria. If I recall this is simply a hold-over from the 305b reports. Nothing magic about the number just what was selected to use in 305b evaluations. It's just a lot more important when used in the 303d process ! I know other states use values greater than the 10% and I think NC should also, especially for certain parameters (turbidity would be a good example).

Steve





These comments were originally sent to an incorrect email address and were received on 1/2/13

**NORTH CAROLINA WATER QUALITY ASSOCIATION**

**NOVEMBER 26, 2012**

**By Electronic Mail (andy.painer@ncdenr.gov)**

Mr. Andy Painter  
North Carolina Division of Water Quality  
Planning Section  
1617 Mail Service Center  
Raleigh, North Carolina 27699

**RE: NCWQA Comments on Water Quality Assessment Methodology**

Dear Mr. Painter:

The North Carolina Water Quality Association (“WQA”) appreciates the opportunity to provide comments on the Division of Water Quality’s (“DWQ’s”) water quality assessment methodology. The WQA comprises public water, sewer, and storm water utilities statewide serving a significant majority of the population in the state.

The assessment methodology has significant ramifications for the regulated community and the public at large because it determines which waterbodies will be listed as impaired. Such listings impose regulatory restrictions which can range from more stringent point source discharge requirements to land use restrictions. The WQA submitted a letter to DWQ Director Chuck Wakild on July 17, 2012 with suggestions for North Carolina’s 303(d) listing process, as well as a comment letter addressed to Ms. Kathy Stecker on October 22, 2012 on the EMC’s role in setting water quality assessment methodology. The WQA incorporates those letters by reference into these comments.

One of our prior comments urged DWQ to publish the draft assessment methodology for the next listing cycle in each odd-numbered year for use the following year in the development of the subsequent even-year impaired waters list. We understand that the EMC recently adopted such a process. With that action by the EMC, we believe the issue is resolved.

We request clarification of the provisions in the assessment methodology for setting stream length. The Draft 2014 Use Assessment Methodology states cryptically:

“Reaches vary in length or area and are sometimes split into smaller units to represent application of water quality data. . . . Decisions on the length or area to apply data to are

based on the data type, waterbody characteristics, stations indicating similar water quality, watershed information and landmarks on which to base descriptions.”

We think the procedure currently set forth in the assessment methodology is so vague as to be essentially standard less. The WQA recommends that the assessment methodology set forth more objective guidelines. For example, we think biological impairment listings should be limited to the stream lengths actually surveyed. As to other impairments, the procedure could establish a hierarchy of methods for establishing stream length (from most robust to least) for field crews to follow.

The WQA urges DWQ to strengthen the “Data Availability and Quality” section of the assessment methodology. The section should be amended to require DWQ to maintain an online, publicly accessible database of all water quality data used for listing purposes. All such data should be available on an ongoing basis, as it has been validated. This is critical to allow stakeholders to evaluate DWQ’s available data with an eye toward filling any gaps or to collect additional data where more data will better help determine the water body’s impairment status.

All data supporting listing decisions must be available and easily accessible at the outset of the public comment period for the draft 303(d) list so that the public has a meaningful opportunity to evaluate the data and prepare comments. Having to request data from DWQ during the comment period deprives the public of the full comment period and is grossly unfair. Moreover, DWQ’s website should indicate the source and quality of all data provided (i.e., the name of the state agency, private party, etc., that collected the data and certification regarding QA/QC procedures). Underlying information about biological sampling also should be made available, including survey sheets, sampling dates, and any other relevant information (or at least indicate its availability upon request). Additionally, the requisite procedures for biological sampling should be clearly stated, and each survey used for 303(d) purposes should include a certification that the requirements were followed.

With respect to data quality, the assessment methodology should include procedures to ensure the 303(d) listings are based on accurate and representative data. To that end, when a stream is found to have a borderline impairment (e.g., just over 10% of samples exceed an applicable numeric criterion or the stream receives a biological integrity score just below the “good” threshold), the data should be subject to increased scrutiny to determine whether any errors are apparent. In such borderline cases, we believe that additional samples should be taken to increase the confidence in DWQs impairment/non-impairment determination. Where an impairment listing is driven by one or more outlier data points, the data should be subject to increased scrutiny to ensure that the data truly reflect instream pollutant levels rather than sampling, recording, or laboratory error. Extreme values should be evaluated for classification as outliers and should not provide the sole basis for a listing decision. The circumstances surrounding outlier data points should be further investigated to determine if an error can be identified that would justify discarding the outliers for not being representative. Data reflecting isolated events or instream conditions are not representative and should not be used. Where outliers and/or inconsistent data cannot be explained, the stream should be slated for further monitoring, rather than listed as impaired.

Mr. Andy Painter  
November 26, 2012  
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In response to the WQA's comment on the draft 2012 303(d) list that a link to the QAPP webpage should be added to the assessment methodology, DWQ stated "We will add this link to the QAPP to the assessment methodology." DWQ, 2012 303(d) Responsiveness Summary, at Response 20 (March 30, 2012). We appreciate DWQ agreeing to do so and hereby remind DWQ to include a link to the QAPP in the 2014 assessment methodology.

As we have previously commented, the WQA objects to the inclusion of 303(d) listings based upon single data points, including biological integrity impairments based on a single benthic macroinvertebrate or fish community survey. The Draft 2014 Use Assessment Methodology states that a water should be "assessed as Impaired for aquatic life when **a fish community or benthos sample** received a bioclassification of Severe, Poor or Fair," indicating that a biological impairment may be based on a single data point. Draft 2014 Use Assessment Methodology at 10 (emphasis added). The WQA urges DWQ to amend this methodology to prohibit listings based on a single fish community or benthos sample – certainly for borderline assessments of "Fair". Quite frankly, given the regulatory consequences and costs for TMDL development, for a water to be listed as biologically impaired, there should be, at a minimum, two surveys within the prior five years. We particularly object to listings based upon a single survey where the result is a borderline impairment. Where a survey indicates a borderline fair/good impairment the use assessment methodology should require that a repeat survey be performed to verify that the stream is in fact impaired. The WQA supports provisions in the assessment methodology requiring a minimum number of samples for non-biological data in order to designate a water body as being impaired.

The WQA urges DWQ to add provisions to the use assessment methodology explicitly allowing waters previously included on North Carolina's 303(d) List to be delisted for "good cause" as defined in EPA's regulations. Under 40 C.F.R. § 130.7(b)(6)(iv), "Good cause includes, but is not limited to, more recent or accurate data; more sophisticated water quality modeling; flaws in the original analysis that led to the water being listed in the categories in § 130.7(b)(5); or changes in conditions, e.g., new control equipment, or elimination of discharges." It should be noted that a good cause showing is not necessarily required to support a delisting decision. *See Thomas v. Jackson*, 581 F.3d 658, 665 (8th Cir. 2009) ("[W]e note that EPA 'may' request a showing of good cause, but the regulations do not require it to do so."). However, the use assessment methodology should provide that a water must be delisted whenever good cause exists.

We object to provisions in the assessment methodology requiring waters to be listed as impaired whenever DHHS issues a fish consumption advisory. A waterbody should only be included on the 303(d) list if it exceeds a water quality standard promulgated in state regulation. A DHHS advisory based on an unpromulgated fish tissue action levels cannot legally justify an impairment listing (unless the listing regulations so provide – and they do not).

We object to US EPA's recent assertion of an unpromulgated policy that waters should be listed if an applicable water quality standard is exceeded more than once in any three year period, regardless of whether 90 percent or more of the available data are below the criterion. EPA proposed this unpromulgated policy in its Decision Document on North Carolina's 2012 303(d) List, disapproving DWQ's proposed delisting of the North Toe River on the grounds that

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two copper exceedances occurred within a three year period. However, this 1-in-3 year return frequency criterion is not mandated by the Clean Water Act, nor has it been properly promulgated as a regulation. Therefore, EPA lacks the authority to impose it as a binding legal requirement on the state, and DWQ is not obligated to incorporate the 1-in-3 year criterion into the water quality assessment methodology. *See National Mining Association v. Jackson*, Nos. 10-1220, 11-0295, 11-0446, 11-0447, 2012 WL 3090245, at \*8 & n.10, 14, 17 \_\_ F. Supp. 2d \_\_ (D.D.C. July 31, 2012).

We also object to the 1-in-3 year criterion from a practical standpoint and urge DWQ not to incorporate it into the state's water quality assessment methodology. The WQA has analyzed the data supporting several impairment listings and has found a number of problems with the data, leading the WQA to question the quality of DWQ's statewide data. For example, the copper data for the North Toe River showed that the two exceedances were both clear statistical outliers, suggesting a sampling, recording, or laboratory error. Additionally, there are frequently extended intervals between sampling, raising concerns about the current representativeness of the state's sampling. Because we have doubts about the quality and representativeness of DWQ's data, we are concerned that applying the 1-in-3 year criterion could result in erroneous listings. While still conservative, the 10 percent approach is more reliable in these circumstances for making listing decisions. The ten percent methodology should be retained in the 2014 Use Assessment Methodology as the sole criterion.

**Quantifying Data.** We are unclear whether DWQ uses any data which are found to be below applicable quantitation levels. We believe that data below PQLs should be assigned values of "0". We would like to know what DWQ's procedure is in terms of the use of data which are below quantification levels.

Lastly, but significantly, we urge the DWQ to prepare electronic listing fact sheets for each new listing. The fact sheet should include the following:

1. Summary of the waterbody
2. Identify the pollutant(s) of concern
3. Provide a link to the raw data and associated information (QA/QC, etc)
4. Explain how the data meet the listing criteria
5. Other appropriate information

Such fact sheets are entirely warranted for impaired waters listings to readily inform interested stakeholders as to the scope and basis for the listing. While we would like to see such fact sheets for all listed waters, we recognize DWQ staff limitations. Accordingly, we propose that DWQ start fact sheet development for waters which will be added (and, maybe, subtracted) to the 2016 list. We believe the preparation of such fact sheets will play a significant role in enhancing the quality of the listing program.

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Thank you for considering our comments. Please do not hesitate to contact me should you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Chad Ham". The signature is written in a cursive style with a large initial "C" and a distinct "H".

Chad ham  
NCWQA President

cc: NCWQA Members  
EMC Members  
Mr. Chuck Wakild