2016 303(d) Responsiveness Summary
June 3, 2016

Public comments were received from the following entities and individuals:

1. Bill Floyd – Citizen
2. Kemp Burdette and Gray Jernigan - Cape Fear River Watch / Waterkeeper Alliance
3. Chad Ham – Fayetteville Public Works Commission
4. Peter W. Schneider – City of Greensboro
5. Michelle Woolfolk – City of Durham
6. Dan McLawhorn - Lower Neuse Basin Association / Neuse River Compliance Association
7. Will Hendrick - Southern Environmental Law Center
8. Pam Hemminger - Upper Neuse River Basin Association
9. Will Scott - Yadkin Riverkeeper
10. US Environmental Protection Agency

These comments with NC Division of Water Resources (DWR) responses are below.

Comment Source: Bill Floyd, Private Citizen

Since November 2014, I have complained to multiple employees of NC DEQ about a lengthy segment of the Chattooga River being a water quality limited segment—due to the deposition of an excessive amount of embedded sediment *which is bank to bank and over a foot deep in places*. I have provided NC DEQ with multiple photographs and latitude and longitude coordinates for where this water quality degradation is occurring.

Attached *again* are three photographs that tell the tale—Floyd Pictures Exhibit A Sediment. This excessive amount of embedded sandy sediment has filled in most, if not all, of the interstitial spaces which are critical to preventing a decline in wild trout population survival. Most importantly, this excessive embedded sediment has degraded both the quality as well as the quantity of streambed habitat which remains suitable for the successful spawning of wild trout.

Despite claims to contrary, this embedded sediment problem does not constitute the normal background condition of this Outstanding Resource Water. Decades of experience of having walked and waded every inch of this streambed (including the gorge beside the Chattooga Cliffs below Cane Creek) advise that these conditions are anything but normal conditions. These conditions constitutes the canary in the coal mine for management failures by somebody—either the United States Forest Service or the state of North Carolina.

Unfortunately, my concerns have been left to fall between the cracks *or have been dismissed outright by the United States Forest Service.* Unfortunately, NC DEQ has *only* been conducting bug monitoring for the purposes of compiling the Section 303(d) list at two roadside locations, which are convenient to access, *but which are also unfortunately miles above, and miles below the location of this water quality limited segment*. This water quality limited segment stretches from just below the confluence of Green Creek downstream to the confluence of Cane Creek. It is a remote section of the river that takes time to access. There is no trail that runs conveniently along the riverbank. To see the problem, you have to wade the river.

In short, the section of the Chattooga River which is being choked has simply gone unmonitored by NC DEQ—and where there is excessive sediment, bug studies alone are not sufficient to conclude that the trout habitat has not been degraded in violation of North Carolina water quality standards.

This failure to monitor is critical because the Forest Service has claimed a right to rely on NC DEQ water quality assessments. Using North Carolina's reports, the Forest Service denies the existence of any problem— despite having been provided with credible photographic evidence of its existence. The Forest Service has *specifically* pointed the finger of responsibility for addressing any sedimentation problem at the state of North Carolina. See the Forest Service's Environmental Assessment dated May 2015.

In July 2015, the USFS was formally advised, for the *second time,* of the existence of this excessive embedded sedimentation problem. The Forest Service was also advised *how this water pollution problem was being exacerbated* by its continued promotion of a highly incompatible recreational use of this particular section of the Chattooga: *creek boating*. The Forest Service was provided with photographic evidence of how the soils on the top of the river's banks were being visibly displaced and pushed into the river as a consequence of creek boater's "seal launching" into the creek at multiple "portage" locations. In addition to creating new chronic erosion sites, the USFS was advised that creek

boaters had unlawfully cut down rhododendron *within North Carolina's trout buffer* in order to create greater convenience of portage trails (trails which the USFS own inventory of erosion sites confirms did not exist prior to the introduction of creek boating in 2012). The Forest Service was shown how paddlers were also creating specific point sources of water pollution when they evacuate the river.

Attached as Exhibit B are a second set of photographs, along with a narrative explaining the significance of these photos, that document how the Forest Service's promotion of this recreational use is causing the degradation of North Carolina's water quality. In one of the pictures, if you look closely, you can see how creek boaters have *actually excavated* a narrow slide in the bank to facilitate their boat launch. These annotated photographs demonstrate how the damage being done has exponentially increased during the current boating season—without any response by the Forest Service.

Unfortunately, the USFS has refused to monitor and study the physical conditions of the stream bed, or to assess the condition of the trout population. Despite the fact that the wild trout population constitutes the primary aquatic management indicator species ("MIS") for the Chattooga River under the Nantahala National Forest's ("NNF") current Land Resource Management Plan, the USFS has instead opted to reference and to rely *exclusively* on literature relating to geographically irrelevant and out of date fish population studies conducted much further downstream in South Carolina and Georgia.

Furthermore, the USFS refusal to act, coupled with its finger pointing towards the state of North Carolina, suggests that the USFS believes that the results of the state of North Carolina's two bug sampling sites on the Chattooga constitute a sufficient proxy for refuting any concerns that sediment may be adversely impacting either the trout habitat or the health of trout populations themselves---despite the fact that the Forest Service has contemporaneously sworn in North Carolina Federal District Court that similar bug studies were insufficient and "*generally poor indicators of ecosystem stress due to sedimentation"* in evaluating the impacts of sedimentation on the Tellico River. See *Southern Four Wheel Drive Association v United States Forest Service,* Case 2:10-cv-00015, Document #39, page 27 (emphasis added).

In fact, the Forest Service attributes this assertion to the NC DEQ.

Such inconsistent explanations must not be allowed to justify the USFS management actions that are now causing additional damage to the state of North Carolina's water quality and the condition of the Chattooga's trout buffer. The actions of the USFS violate North Carolina's antidegradation policy. 15A NCAC 02B.0201 and 40 CFR 131.12.

Despite the difficulty of accessing the current habitat conditions of this remote location, the only scientific way to understand the scope of this sediment problem is to commit sufficient time and resources to physically wade and boulder hop the entire stream bed while conducting fish monitoring and habitat assessments and stream sediment studies. Unfortunately, the USFS has chosen to ignore this water quality problem while pushing forward with the introduction of a new recreational use on this segment of the Chattooga.

I remain dedicated to seeing a positive end result for this problem. I remain willing to lend arms and legs to assist NC DEQ in investigating and bringing an appropriate solution to this problem—other than the acceptance of the denial so loudly pronounced by the United States Forest Service. Please advise how we can work together. I have prepared a virtual tour through photographs and narrative that might be used to become more familiar with the terrain and where the problem is specifically occurring.

DWR Response: *Thank you for your environmental protection interest and the information you provided on the Chattooga River. As you stated in your comments, DWR has been monitoring up and downstream of the inaccessible area that you provide information on. Our data consistently have shown excellent water quality based on benthic community monitoring downstream of the segment you mention since 1988. If there is a limited segment that is impacted by sediment, it is correcting and meeting standards downstream of the areas you mention. This does not mean it is not a violation of water quality standards in the areas where you are referring to. If there is a violation of a water quality standard, then an appropriate enforcement action can take place regardless of the 303(d) status of the waterbody.*

Additional follow-up: DWR contacted the Regional Operations staff, Water Sciences Biological Assessment Branch, and Basinwide staff and they indicated Mr. Floyd has been in contact with them. They have gone out to investigate this site. DWR has developed a study plan to further investigate this site. Mr. Floyd has also been in contact with EPA, EPA is investigating the potential to assist with further investigation of the site.

Comment Source: Kemp Burdette and Gray Jernigan - Cape Fear River Watch / Waterkeeper Alliance

Request to 303(d) list Stockinghead Creek AU# 18-74-24.

In 2013, Cape Fear Riverkeeper and Waterkeeper Alliance asked Michael A. Mallin, Ph.D., Matthew R. McIver, Anna R. Robuck and Amanda Kahn Dickens, Ph.D. at the Center for Marine Sciences, University of North Carolina at Wilmington, to evaluate water quality conditions in the Stocking Head Creek subwatershed of the Cape Fear River. Their analysis of water quality data demonstrates that Stocking Head Creek is impaired by nutrients and bacteria.

Stocking Head Creek is a 2nd order stream located in the Northeast Cape Fear River basin on the Coastal Plain of North Carolina. It lies within 8-digit Hydrologic Unit Code 003030007, and is classified as C Sw waters by North Carolina Division of Water Resources. Catchment area is 4,893 acres (1,980 ha) and stream length to the Northeast Cape Fear River is 13.7 mi (22.1 km). The Northeast Cape Fear River is a 5th order tributary of the 6th order Cape Fear River, the watershed of which contains approximately half of the 9,000,000-plus swine produced in North Carolina. It is estimated that the Cape Fear River basin produced (in 1995) 82,700 metric tons of nitrogen and 26,000 metric tons of phosphorus as waste in this watershed.

Monitoring of Stocking Head Creek by Michael A. Mallin, Ph.D., Matthew R. McIver, Anna R. Robuck and Amanda Kahn Dickens, Ph.D., Center for Marine Sciences at the University of North Carolina at Wilmington supports our request to have Stocking Head Creek added to the 2016 303(d) list of impaired waterways. Dr. Mallin reported that nutrient and biologic parameters consistently far exceed generally accepted water quality standards and other measures of water quality and use support for C Sw waterways.

These parameters include (as documented in the attached report):

- Ammonium: Ammonium is a form of chemically reduced inorganic nitrogen that is often associated with fresh human sewage or animal manure. It is readily taken up by visible plants, algae and bacteria for growth. When exposed to dissolved oxygen in the presence of nitrifying bacteria it is converted to nitrate by the process of nitrification. There is no ambient ammonium standard for North Carolina waters. However, academic research has indicated that ammonium concentrations of 0.5 mg/L (ppm) and greater stimulate algae blooms in blackwater streams (Mallin et al. 2001; 2002; 2004). Additionally, since ammonium is a chemically reduced form of nitrogen, during the nitrification process it can exert a chemical oxygen demand on waters receiving sewage or animal waste inputs, contributing to lowered dissolved oxygen. Thus its concentration in sewage outfalls is regulated by NPDES permits for point-source discharges.

  Ammonium in Stocking Head Creek during the 10 sample trips ranged from the detection limit (0.05 mg/L) to 37.8 mg/L (Table 1). Highest ammonium concentrations were found at Station TR-SDCR, followed by Station SHC-SHCR. The ammonium concentrations found at those sites were well in excess of ammonium concentrations found in many other creeks in the Northeast Cape Fear and Black River watersheds (Mallin et al. 2004; 2006). Only during swine lagoon breaches have such concentrations been found in blackwater streams (Burkholder et al. 1997; Mallin 2000). The presence of elevated ammonium indicates periodic loading to the stream of fresh inputs.

- Nitrate: Nitrate is a chemically oxidized form of inorganic nitrogen, and is used by visible plants and algae for growth. It is very mobile in soils and readily moves through the water table to enter streams. Sources are sewage, animal wastes, and fertilizers, as well as atmospheric deposition generated (even far away) from power plants and internal combustion engines. There are no ambient nitrate standards in North Carolina. However, academic research has indicated that nitrate concentrations of 0.5 mg/L (ppm) and greater can stimulate algae blooms in blackwater streams (Mallin et al. 2001; 2002; 2004). There is a US EPA well water standard for drinking of 10 mg/L to prevent blue-baby syndrome (also called methemoglobinema).

  Nitrate concentrations in Stocking Head Creek were very high (Table 2). Whereas the highest ammonium concentrations were found at two sites, several sites showed high nitrate. Concentrations ranged from 0.08-13.60 mg-N/L, with station means ranging from 0.30-7.94 mg-N/L (Table 2). Particularly high nitrate concentrations were seen at these four sites: SHC-GDR, SHC-CSR, SHC-SDCR and SHC-SHCR; lowest concentrations were at MC-50. Average concentrations at all stations except SHC-50 were at levels known to lead to elevated BOD in blackwater streams (Mallin et al. 2004). The concentrations seen in this creek were well in excess of numerous creeks this laboratory has studied in the Cape Fear River basin, except for a couple that were impacted by faulty point-source sewage effluent discharges (Mallin et al. 2004; 2006). It is notable that on two occasions even the 10 mg/L standard for drinking well water was exceeded (Table 2).

- Total Nitrogen (TN): TN is the total combined organic and inorganic nitrogen in the water. There are no ambient standards for TN in North Carolina waterways. For the combined sampling periods TN concentrations ranged from 0.11-46.70 mg-N/L, while station averages ranged from 0.54 mg-N/L at SHC-50 to 15.71 mg-N/L at TR-SDCR. The TN values were dominated by inorganic nitrogen (i.e. nitrate and ammonium) rather than organic nitrogen, as is frequently the case in blackwater streams in North Carolina (Mallin et al. 2004; 2006). The TN concentrations in Stocking Head Creek are very high compared to a wide range of blackwater Coastal Plain streams as sampled by the Lower Cape Fear River Program (http://www.uncw.edu/cms/aelab/LCFRP/index.htm) as well as values reported in the literature. To provide a wider perspective, using a large data set of 1,070 streams Dodds et al. (1998) determined that TN concentrations > 1.5 mg/L were characteristic of eutrophic conditions.

- Orthphosphate: Orthophosphate is the most common form of inorganic phosphorus. Sources are fertilizers, human sewage and animal manures. There are no ambient orthophosphate standards for North Carolina waterways. Orthophosphate concentrations in Stocking Head Creek in July and August ranged from 0.07 – 2.02 mg- P/L, with station means ranging from 0.13 – 0.63 mg-P/L. The station means generally ranged from 2-10X the average levels found in a selection of blackwater coastal plain streams (Mallin et al. 2006). As a comparison with another CAFO-rich watershed, in the Herrings Marsh Run study (Stone et al. 1995) average orthophosphate concentrations in a stream section draining intensive swine and poultry operations were 0.68 mg-P/L, and average orthophosphate of 0.78 mg-P/L were in the stream station exiting the watershed. It is notable that orthophosphate is not very mobile in soils, as it has a strong affinity for soil particles, especially clays.

- Total Phosphorus (TP): TP is the total of inorganic plus organic phosphorus in the water column. There are no ambient standards for North Carolina waterways. However, bacteria require P both structurally and energetically (Kirchman 1994), and fecal bacteria in stream sediments can be stimulated by inputs of phosphate (Toothman et al. 2004; Cahoon et al. 2007). Also, fecal coliform bacteria in the water column are stimulated by organic and inorganic inputs, increasing survival and reproduction (Chudoba et al. 2013). Concentrations of TP of 0.50 mg-P/L or greater can increase biochemical oxygen demand (BOD) in blackwater streams by serving as a substrate assimilated by ambient bacteria in the stream (Mallin et al. 2001; 2002; 2004). TP ranged from 0.050 – 10.70 mg-P/L, and station means ranged from 0.15 at SHC-GDR to 2.83 mg-P/L at TR-SDCR. Station TR-SDCR had the highest concentrations, followed by SHC-SHCR (Table 5). On 11 of the 70 samples, TP was higher than 0.50 mg- P/L, above which BOD was found to increase significantly over control in nutrient addition experiments for several blackwater streams (Mallin et al. 2004). With the exception of TR-SDCR, TP at the other stations were in the range of subsurface drainage plots to which swine waste lagoon liquid were applied, which averaged TP ranging from 0.20 to 0.50 mg-P/L, depending upon application rate (Evans et al. 1984). Again looking a broader perspective, using data from 1,366 streams Dodds et al. (1998) concluded that TP concentrations > 0.075 mg/L were characteristic of eutrophic stream.

- Chlorophyll a: Chlorophyll *a* represents the amount of suspended micro-algal material found in a sample of water. North Carolina has a chlorophyll *a* standard of 40 µg/L (ppb) above which waters are considered eutrophic, or impaired by excessive algal blooms. All summer samples were below the standard, except one sample at TR-SDCR on July 29 which was 40 µg/L. In fall a bloom of 44 µg /L occurred at TR-SDCR on September 18, and smaller blooms of 25 µg/L occurred at SHC-50 on September 18 and 28 µg/L at SHC-GDR on September 24. Thus, algal blooms occurred within Stocking Head Creek, but were inconsistent in time and among sampling sites.

- Biochemical Oxygen Demand (BOD): Biochemical oxygen demand (BOD) is a measure of the organic matter available for consumption by the bacteria in a body of water during respiration. As the bacteria consume organic material that has entered the water (via the process of respiration) they use up dissolved oxygen in the water; in extreme cases lowering DO to levels dangerous to fish and invertebrates. One cause of BOD are algal blooms, which eventually die, and this creates a mass of labile (easilydigested) organic matter for the bacteria to consume, and dissolved oxygen in doing so. Another common cause of BOD is the introduction of labile organic materials such as human sewage or animal waste into the water. There are no ambient standards for BOD in North Carolina stream waters; however, comparison of BOD from many streams, creeks and rivers in North Carolina indicate that concentrations of 1 to 2 mg/L can be considered normal (Mallin et al. 2006).

  Five-day BOD (BOD5) ranged widely (Table 7), from background concentrations of 1.0 mg/L all the way up to a maximum of 88 mg/L at Station TR-SDCR on September 16. That station maintained the highest overall concentrations (Table 7), reaching or exceeding 10 mg/L on six of 10 occasions. Station SHC-SHCR exceeded 10 mg/L on three occasions, with a peak of 25 mg/L on August 18. Other stations (SHC-PBR, SHCCSR) did not show unusually high concentrations. The stream stations with the highest BOD concentrations were those in closest proximity to swine waste sprayfields (Plates 4A and 4B; 9A and 9B).

Based on these results, we request that you list Stocking Head Creek as a Category 5 water to the North Carolina 2016 303(d) List based on these indicators of water quality degradation, use impairment, and nutrient pollution in violation of state water quality standards, and that a TMDL be developed for this waterbody.

Additionally, an extensive analysis of the fecal coliform levels in Stocking Head Creek in relation to water quality criteria was prepared by Michael A. Mallin, Ph.D., Center for Marine Sciences University of North Carolina Wilmington, on January 28, 2014 and is attached hereto. The analysis presented demonstrates that:

> Seven stations in Stocking Head Creek, Duplin County, North Carolina, were sampled on five occasions within 30 days in both summer and fall 2013. The data indicates that Stocking Head Creek is highly polluted by fecal bacteria, by both measures of the NC criteria. The upper five stations exceeded 400 CFU/100 ml 96-100% of the time sampled, and six of seven stations exceeded a geometric mean of 200 CFU/10 mL for five samples in both 30 day periods. Elevated fecal coliform counts occurred during both wet and dry periods; this creek is chronically polluted by fecal bacteria.

Accordingly, we request that you add Stocking Head Creek as a Category 5 water to the North Carolina 2016 303(d) List for fecal coliform violations, and that a TMDL be developed for this waterbody.

Consistent with NCDEQ's guidelines for submission of data for regulatory use, all of the data collected by Dr. Mallin meet the same data quality requirements as for internal NCDEQ activities. Additional information to support this request for listing Stocking Head Creek is available in any format requested by the NCDEQ and the data is of acceptable quality. The methodology is described in detail in the attached document. The research and analysis has also been published in a peer-reviewed journal, a copy of which is attached to this correspondence.

Notably, this request, accompanied by the same data and analysis conducted by Dr. Mallin, was submitted to NCDEQ during the previous 303(d) public comment period in March 2014. Despite the requirement to "assemble and evaluate all existing and readily available water quality-related data and information" to develop the 303(d) list, NCDEQ rejected this data from evaluation because it fell outside of the arbitrary "data window" established by NCDEQ, which for the 2014 303(d) list was 2008 to 2012. Although we reiterate our position that the establishment of arbitrary data windows is a violation of the clear federal mandate to evaluate all existing and available data, NCDEQ should now fully consider this data and grant our request to list Stocking Head Creek on the 2016 303(d) List.

In the event that NCDEQ decides not to list Stocking Head Creek on the 2016 303(d) List, it is required under 40C.F.R. §130.7(b)(6) to provide documentation to the Regional Administrator to support the State's determination, including "[a] rationale for any decision to not use any existing and readily available data and information for any one of the categories of waters as described in" section 130.5(b)(5).

We request the opportunity to review this data and analysis with you prior to your making a listing decision to answer any questions or concerns that may arise. We believe that the data analysis demonstrate that Stocking Head Creek is impaired by nutrients and fecal coliform in violation of North Carolina's water quality standards, and as a result, must be listed on the North Carolina 2016 303(d) List. Stocking Head Creek must be placed in Category 5 because "[a]vailable data and/or information indicate that at least one designated use is not being supported or is threatened, and a TMDL is needed." In the

event you disagree, we would welcome the opportunity to further discuss your concerns prior to your making a final listing decision.

DWR Response: *DWR did not receive data to make assessments for the parameters listed in this request. DWR provided the commenters with instructions on how to submit data for assessment on the 2014 303(d) list response to comments as well. Also there are not evaluation levels in the EMC approved standards for ammonium, total nitrogen, orthophosphate, total phosphorus, nitrate and biochemical oxygen demand for these waters.*

There are water quality standards for chlorophyll-a and fecal coliform bacteria. Data from the sites noted were not submitted for DWR to use for assessment of these two parameters. However, based on the information provided in the comments, it would not be listed as impaired for chlorophyll-a. The information provided in the comments for fecal coliform bacteria is not adequate to make an impairment determination. That said, however, the data and information provided can be used for determining if a more detailed study plan could be useful for evaluating the water quality status of the subject waters.

For DWR to use data for 303(d) assessments, data must be submitted using the procedures available at the website below. Summary information is helpful, but raw data is required for assessment. Data submitted for 303(d) assessments must be publicly reviewed as well, which is why it is essential that data is submitted before the 303(d) list goes out for public comment. While data can be submitted at any time, the next assessment deadline for 2018 will be May 2017 and will include data collected for calendar years 2012-2016. Because the data collected for the Cape Fear River Watch / Waterkeeper Alliance was collected in 2013, DWR strongly encourages submittal of this data for consideration for the 2018 303(d) list.
http://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/water-quality-data-assessment.

Regarding the data window of 2010-2014 established as the assessment period, these windows are established by the EMC in the Assessment Methodology. DWR encourages the commenter to participate in the next round of public review of the assessment methodology to suggest appropriate alternatives.

DWR will follow-up with the commenters to discuss the data submittal process as well as to share available information the Division has for these waters.

Comment Source: Chad Ham – Fayetteville Public Works Commission

The Public Works Commission (PWC) of the City of Fayetteville closely monitors water quality conditions and activities that can influence water quality in the Cape Fear River since it is a vital resource for our region and our principal source of water supply. We have been a member of the Middle Cape Fear Basin Association (MCFBA) since its inception in mid- 1998. The MCFBA has been conducting monitoring of the river since mid-1998 at between 30 and 35 stations in the middle portions of the Cape Fear River basin as part of the Division of Water Resources' (DWR) coalition monitoring programs. The MCFBA has taken the approach of taking water quality samples on a consistent (monthly) – year-round basis with the exception of additional collection of field parameters during summer periods.

In the draft 303d list – new Category 5 Assessment listings – DWR has included a segment of the Cape Fear River "From NC Hwy 42 to a point 0.6 mile downstream of mouth of Daniels Creek" as being impaired based on exceedances of the water quality standard for chlorophyll *a.* This listing seemed unusual since the MCFBA data for a station at highway 42 on the Cape Fear River from 2010 through 2014 showed only 2 samples out of 60 monthly samples exceeding the chlorophyll *a* standard. This would be insufficient to identify the segment as impaired. After inquiring to DWR, it was explained that this segment was listed based on data collected during special studies conducted in 2010 and 2013 where samples were collected downstream of Hwy 42 – immediately above the Buckhorn Dam. Five samples were collected between May and September 2013 and five were collected between July and October 2010. Of these 10 samples, four exceeded the chlorophyll *a* water quality standard. Although both the MCFRA and DWR data were both collected in the impounded portion of the river behind Buckhorn Dam, these were treated as independent data sets for assessment purposes. In discussion with DWR staff, they indicated that they are required to assess these sites independently because they were separate stations. DWR Staff agreed that the segment listing should end at Buckhorn Dam and not include the area below the dam to below the mouth of Daniels Creek since this was a free flowing portion of the river and the data behind the dam was probably not representative of free-flowing riverine conditions. They also agreed to assess this area as an acreage impaired rather than as a river segment since this area was technically an impoundment.

PWC greatly appreciates DWR's willingness to discuss the listing and to make changes. However, these results point to a number of issues with the methodology uses to assess impairment as noted below:

- First, the methodology allows the use of "selective sampling data" for the purposes of assessment as long as there are at least 10 samples. DWR special studies were conducted in association with investigations of algal blooms on the Cape Fear River and only sampled periods were conditions were likely to be conducive to algal growth.

DWR Response: *North Carolina lakes have historically only been sampled during summer months as this is "the growing season" and is when algal blooms are most likely to occur. The intent behind the chlorophyll-a standard is to prevent excessive growths of microscopic or macroscopic vegetation. The state's assessment methodology provides for a 10% exceedance rate with 90% confidence results in impairment for a water quality standard, which in this case is the chlorophyll-a standard.*

- Second, the distance between the MCFRA site at Hwy 42 and the DWR site at Buckhorn dam is about 2 miles. Since both these sites are in impounded portions of the Cape Fear River, it would seem logical to combine these data sets in assessing the impairment status

of the impoundment; especially since one data set (the MCFBA data) is collected in a regularly scheduled, non-selective approach.

DWR Response: *Assessments are made for each station independently. When data indicate differences in water quality between stations, new assessment units may be established if needed.*

- Third, this example also points to the inappropriateness of having an instantaneous standard (that is currently applicable year-round), rather than a seasonable standard based on some measure of central tendency – such as a mean or geomean value. If this was a seasonal standard based on average conditions – with a required minimum number of samples and reasonable distribution of samples during the season – selective data such as what is used in the DWR lake sampling program would be more appropriate for assessment purposes.

DWR Response: *DWR is currently working with an established Nutrient Criteria Development Plan – Science Advisory Council (NCDP SAC) and interested stakeholders toward development of revised nutrient criteria. DWR encourages the Fayetteville Public Works Commission to participate in the stakeholder process. The website for the NCDP can be found here: http://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/nutrient-criteria-development-plan.*

- Finally, DWR is currently in the process of developing nutrient criteria for this portion of the Cape Fear basin. Although it will be several years before these criteria are adopted, we suggest it might be appropriate to consider the consequences of listing this segment as impaired based on the conflicting assessments from two closely located sampling sites (with MCFBA site having substantially more, regularly collected data) and the current water quality standard when the standard will likely change. One possible change could be a seasonal average, which might result in a different use attainment outcome. If that were to occur, DWR would have a stream that was listed based on an outdated water quality standard similar to the situation that has occurred with the metals data, i.e., impairments that result in major sampling and expense to remove them from the list when they were not really impaired to begin with.

DWR Response: *When revised nutrient criteria for the Cape Fear River are developed, proposed and ultimately adopted through state rulemaking mandates including public input processes, they will be implemented using sampling protocols appropriate for assessment of the specific criteria. Noting that, if the criteria are seasonal in nature, then sampling and assessment will be designed to assure judgements are made accordingly. Confirmation of impairment for metals or delisting metal decisions, using the dissolved, acute and chronic standards (15A NCAC 02B .0200; adopted January 1, 2015), has not yet occurred in all of the areas that were assessed in prior years. Once samples are collected, DWR will evaluate the data to determine if the prior listing(s) will remain, or may be removed based on assessment using revised state standards.*

PWC is committed to appropriate assessment and protection of water quality in the Cape Fear River basin. We hope these comments are useful for the 2016 303(d) list and future assessment efforts.

Comment Source: Peter W. Schneider – City of Greensboro

1. North Buffalo Creek {16-11-14-1a1} – From source to Philadelphia Lake {WS-V;NSW}

This water body has been added to the 2016 draft list for exceeding the >10% and >90% confidence interval for hardness (100mg/L, WS, WS). The City of Greensboro believes this listing is incorrect and should be removed from the list of impaired waters. The reason for the City's position is based on the improper application of the water supply criteria.

The monitoring location on North Buffalo Creek is located on a water body that was reclassified from Class C; NSW to WS-V; NSW as part of the Jordan Lake Nutrient Management Strategy rules and is subject to Session Law 2012-187, Section 12.1. (See Attachment #1). The specific language pertinent of this Session Law is as follows:

> Rules adopted by the Environmental Management Commission pursuant to S.L. 2009- 216 and S.L. 2009-486 to implement nutrient management strategies for the B. Everett Jordan Reservoir and the Falls of the Neuse Reservoir watersheds **shall not be interpreted to apply surface water quality standards set out in 15A NCAS 2B.0218(3)(e) through (3)(h) to waters designated in the nutrient management rules as WS-V** except where: (i) the designation of WS-V is associated with a water supply intake used by an industry to supply to supply drinking water for their employees; or (ii) standards set out in 15A NCAC 02B .0218(3)(e) through (3)(h) are violated at the upstream boundary of waters within those watersheds that are classified as WS-II, WS- III, or WS-IV. This section shall not be construed to alter the nutrient reduction requirements set out in 15A NCAC 2B .0262(5) or 15A NCAC 2B .0275(3).

DWR Response: *Thank you for pointing out this correction.*

2. Reedy Fork {16-11-(1)a} – From source to UT 0.7 miles downstream of SR 2128 {WS-III;NSW}

This water body has been added to the 2016 draft list for a Fair rating for the benthic macroinvertebrate community. As part of a comprehensive water quality monitoring program, the City of Greensboro Stormwater Management Division has been sampling benthic macroinvertebrates in numerous stream sections since 1999. Sampling is conducted by City staff and specifically follows procedures as outlined in the NC DEQ Standard Operating Procedures for Collection and Analysis of Benthic Macroinvertebrates that was developed by the Biological Assessment Branch (BAB) of the North Carolina Division of Water Resources (DWR). After collection and preservation, benthos samples are then identified and analyzed by a North Carolina certified private contractor (entomologist). For many years the City has retained the services of Lenat Consulting Services, Inc. (Dave Lenat) to perform all analysis of collected samples.

As part of this comprehensive macroinvertebrate sampling program, Reedy Fork Creek {16-11-(1)a} has been sampled on a three (3) year rotation since 1999 and has never received a final bioclassification score below a Good-Fair rating (Attachment #2). The location of the City's sampling location is upstream of the bridge on Bunch Road (SR 2128) and the USGS stream gauge (#02093800). Based on the historical and current data, Reedy Fork Creek is meeting the use support rating for benthic macroinvertebrates and the City of Greensboro is requesting this water body be taken off the 2016 draft 303(d) list.

DWR Response: *Greensboro did not submit benthic macroinvertebrate data to DWR for water quality assessment. DWR staff have been in contact with Greensboro to explain the process to submit data. Most recent DWR benthos data in this AU was rated Fair in 2013. For DWR to use data for 303(d) assessments it must be submitted using the procedures available at the website below. Data submitted for 303(d) assessments must be publicly reviewed, which is why it is essential that data is submitted before the 303(d) list goes out for public comment. While data can be submitted at any time, the next assessment deadline for 2018 will be May 2017 and will include data collected for calendar years 2012-2016. http://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/water-quality-data-assessment.*

3. Reedy Fork (Hardy's Mill Pond) {16 -11-(9)a2} – From UT at SR2782 to UT at SR 2778 {WS-V;NSW}*

This water body has been added to the 2016 draft list for a Fair rating for the benthic macroinvertebrate community. In the summer of 2015 the City of Greensboro entered into a contractual agreement with Acer Environmental, LLC, and Penrose Environmental, Inc., for a habitat restoration project on several small streams located on South Buffalo Creek. As a part of this project, Mr. Dave Penrose from Penrose Environmental, Inc. sampled Reedy Fork Creek upstream of the bridge located on Friendship Church Road. According to the listing for Reedy Fork (Hardy's Mill Pond) 16-11-(9)a2, the site location sampled by Penrose Environmental, Inc., is located within this stream section. The site was sampled on 6/30/2015 and received a final bioclassification score of Good-Fair (Attachment #3). Based on the most recent data, Reedy Fork Creek is meeting the use support rating for benthic macroinvertebrates and the City of Greensboro is requesting this water body be taken off the 2016 draft 303(d) list.

**Note: The City of Greensboro believes this stream segment is labeled incorrectly and should not include Hardy's Mill Pond in the AU Name. DWR's sampling site, the location description, and the map that depicts this water body/stream segment are all located upstream of Hardy's Mill Pond. It is not clear to the City why 'Hardy's Mill Pond' is included in the impairment listing, and we feel the reference to Hardy's Mill Pond should be removed from the AU Name.*

DWR Response: *Greensboro did not submit benthic macroinvertebrate community data for water quality assessment. DWR staff have been in contact with Greensboro to explain the process to submit data. Most recent DWR benthos data in this AU was rated Fair in 2013. For DWR to use data for 303(d) assessments it must be submitted using the procedures available at the website below. Data submitted for 303(d) assessments must be publicly reviewed, which is why it is essential that data is submitted before the 303(d) list goes out for public comment. While data can be submitted at any time, the next assessment deadline for 2018 will be May 2017 and will include data collected for calendar years 2012-2016.*

Also there is a request to use a non- BIMS name. DWR has not done this in the past to avoid confusion but it may be adding to confusion especially in areas where several named lakes are all parenthetically named with the mainstem. DWR will further investigate this issue.

4. Brush Creek {16-11-4-(1)b} – From source to a point 0.5 mile downstream of Guilford County SR 2190 {WS-III;NSW}

This water body has been added to the 2016 draft list for exceeding the >10% and >90% confidence interval for chlorophyll a (40 ug/L, AL, NC). The Water Supply Division of the Water Resources Department conducts lake sampling on the three City-owned water supply lakes (Higgins, Brandt, and Townsend) at different sampling locations on a monthly basis. Attachment #4 shows the chlorophyll a sampling results for the City's Site #3 on Lake Higgins, which is located in close proximity to NC DEQ's sampling point. The City has included monthly sampling data from 1/20/2011 to 12/16/2015. During this time period, the City data only shows one exceedance of the 40 ug/L standard (41.24 mg/m^3 on 12/11/2012). Based on the historic and most recent data, Brush Creek (Lake Higgins) 16-11-4-(1)b is meeting the use support rating for chlorophyll a, and the City of Greensboro is requesting this water body be taken off the 2016 draft 303(d) list.

DWR Response: *Greensboro did not submit chlorophyll-a data for water quality assessment. DWR staff have been in contact with Greensboro to explain the process to submit data. Most recent DWR Lakes Assessment data in this AU showed 6 of 11 exceedances with 100% confidence in exceeding the chlorophyll-a evaluation level in greater than 10% of samples. For DWR to use data for 303(d) assessments it must be submitted using the procedures available at the website below. Data submitted for 303(d) assessments must be publicly reviewed, which is why it is essential that data is submitted before the 303(d) list goes out for public comment. While data can be submitted at any time the next assessment deadline for 2018 will be May 2017 and will include consideration of all data collected for calendar years 2012-2016 if it is submitted to DWR by May 2017.*
http://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/water-quality-data-assessment.

5. Reedy Fork (including Lake Brandt) {16-11-(3.5)b1} – Lake Townsend above first Bridge {WS-III;NSW, CA}*

This water body has been added to the 2016 draft list for exceeding the >10% and >90% confidence interval for chlorophyll a (40 ug/L, AL, NC). Attachment #5 shows the chlorophyll sampling results for the City's Site #1 on Lake Townsend, which is located in close proximity to NC DEQ's sampling point. The City has included monthly sampling data going back to 1/27/2011 up to 12/16/2015. During this time period the City data shows no exceedance of the 40 um/L standard. Based on the historic and most recent data, Reedy Fork 16-11-3.5(b1) is meeting the use support rating for chlorophyll a and the City of Greensboro is requesting this water body be taken off the 2016 draft 303(d) list.

**Note: The City of Greensboro believes this stream segment is labeled incorrectly and should not include Lake Brandt in the AU Name. DWR's sampling site, the location description, and the map that depicts this water body/stream segment are all located downstream of Lake Brandt. It is not clear to the City why 'Lake Brandt' is included in the impairment listing, and we feel the reference to Lake Brandt should be removed from the AU Name.*

DWR Response: *Greensboro did not submit chlorophyll-a data for water quality assessment. DWR staff have been in contact with Greensboro to explain the process to submit data. Most recent DWR Lakes Assessment data in this AU showed 5 of 13 exceedances with 99% confidence in exceeding the chlorophyll-a evaluation level in greater than 10% of samples. For DWR to use data for 303(d) assessments it must be submitted using the procedures available at the website below. Data submitted*

for 303(d) assessments must be publicly reviewed, which is why it is essential that data is submitted before the 303(d) list goes out for public comment. While data can be submitted at any time the next assessment deadline for 2018 will be May 2017 and include data collected for calendar years 2012-2016. http://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/water-quality-data-assessment.

6. Reedy Fork (including Lake Brandt) {16-11-(3.5)b1} – Lake Townsend above first Bridge {WS-III;NSW, CA}*

This water body has been added to the 2016 draft list for exceeding the >10% and >90% confidence interval for turbidity (25 NTU, AL, FW acres & SW). Attachment #5 shows the turbidity sampling results for the City's Site #1 on Lake Townsend, which is located in close proximity to NC DEQ's sampling point. The City has included monthly sampling data from 1/27/2011 to 12/16/2015. During this time period the City data shows no exceedance of the turbidity 25 NTU standard. Based on the historic and most recent data, Reedy Fork 16-11- (3.5)b1 is meeting the use support rating for turbidity and the City of Greensboro is requesting this water body be taken off the 2016 draft 303(d) list.

**Note: The City of Greensboro believes this stream segment is labeled incorrectly and should not include Lake Brandt in the AU Name. DWR's sampling site, the location description, and the map that depicts this water body/stream segment are all located downstream of Lake Brandt. It is not clear to the City why 'Lake Brandt' is included in the impairment listing, and we feel the reference to Lake Brandt should be removed from the AU Name.*

DWR Response: *Greensboro did not submit turbidity data for 2016 water quality assessment. DWR staff have been in contact with Greensboro to explain the process to submit data. Most recent DWR Lakes Assessment data in this AU showed 4 of 13 exceedances with 97% confidence in exceeding the chlorophyll-a evaluation level in greater than 10% of samples. For DWR to use data for 303(d) assessments it must be submitted using the procedures available at the website below. Data submitted for 303(d) assessments must be publicly reviewed, which is why it is essential that data is submitted before the 303(d) list goes out for public comment. While data can be submitted at any time the next assessment deadline for 2018 will be May 2017 and include data collected for calendar years 2012-2016. http://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/water-quality-data-assessment*.

Comment Source: Michelle Woolfolk – City of Durham

The City of Durham Public Works Department appreciates the opportunity to provide comments on the draft 2016 North Carolina 303(d) List. The City of Durham holds a National Pollutant Discharge Elimination System (NPDES) Stormwater Permit and is a Phase I city. The City's stormwater NPDES permit requires the development of response plans for all EPA approved Total Maximum Daily Loads (TMDLs). This requirement makes the 303(d) list, and other lists that include waters not currently meeting water quality standards, important to the operation of the stormwater program.

As mentioned in past comment letters, the Public Works Department supports the availability of all impaired waters lists, whether or not a TMDL is required. The NC Division of Water Resources (DWR) website should not only include the 303(d) list, but other sections of the Integrated 305(b) and 303(d) report that include waters that are not meeting water quality standards but don't require a TMDL. The City of Durham is subject to a variety of regulations related to stormwater control including nutrient management strategy requirements, water supply watershed requirements, and addressing pollutant loads to impaired waters. In some cases, these programs are implemented through the joint City/County Unified Development Ordinance, which provides stormwater control guidelines and goals for developers. Listing all impaired stream segments, whether or not a TMDL is required, will support the development community as they comply with the Unified Development Ordinance.

DWR Response: *The comment period was for the 303(d) list which is category 5 of the Integrated Report. However, all draft Integrated Report assessments were provided by DWR staff in assessment Fact Sheets upon request. DWR is working to have the full Integrated Report available in a map and draft list for 2018. Upon EPA final approval of the 2016 303(d) list, DWR will post the entire Integrated Report on the website.*

The City of Durham believes that the 303(d) listing methodology should be revised and re-approved in order to include monitoring data collected in a manner differently than defined in DWR standard operating procedures and quality assurance project plans (for example, the Intensive Survey Branch Standard Operating Procedures Manual: Physical and Chemical Monitoring, 2013). The methodology and monitoring data used to determine the appropriate Integrated 305(b) and 303(d) listing of segments of Falls Lake (Neuse River Basin) was modified for the 2016 303(d) list. In the past, an implicit assumption for evaluating all lakes and reservoirs in the state was to use monitoring data collected from the entire photic zone. This implicit assumption was in place primarily because all of the data used for lake use support decisions was collected by DWR and DWR defines the photic zone as twice the Secchi depth (ISU SOP 2013, page 106). The use of photic zone composite samples, collected from twice the Secchi depth, from sources other than DWR is acceptable to the City of Durham. During this listing cycle, however, it appears that data collected from one-half of the photic zone, or depth averaged to the Secchi depth, was used for the Integrated 305(b) and 303(d) Report. This is a substantive change to the 303(d) listing methodology which has previously implicitly referenced reservoir photic zone composite samples as defined by DWR. If it is DWRs intent to allow data other than photic zone composite samples in the assessment of Falls Lake, the methodology should explicitly describe how such data will be used in any reservoir, lake or estuary.

DWR Response: *DWR agrees that using data collected using Standard Operating Procedures (SOPs) that differ from DWRs own SOP may lead to inconsistent approaches in making listing determinations. Therefore, DWR has removed third party data that was not collected in accordance with DWRs SOP from the assessment and will work to improve communication of the data requirements for future 303(d) lists.*

The Public Works Department supports the use of the recently adopted hardness-dependent dissolved metals water quality standards. We request that any information on the monitoring and assessment methods to be used with these new standards be made available for public comment as soon as possible. The City of Durham has long understood the link between water hardness and metal toxicity. As a result, the City's ambient monitoring program is designed to evaluate the EPA Criteria Continuous Concentration (CCC) and CMC (Criteria Maximum Concentration) using monthly grab samples. Two Durham creeks that are currently included on the 303(d) list are Third Fork Creek and Northeast Creek. Based on our information, the zinc CCC was not exceeded in Third Fork or Northeast Creek during the 2010-2014 assessment period, nor in the time since.

DWR Response: *This comment is not related to the 2016 draft 303(d) list. The City of Durham can submit data through the data submittal process to be used for the 2018 assessment. The US EPA approved the revised metals water quality standards, adopted for state purposes in January 1, 2015, on April 6, 2016. DWR intends to start water quality assessments for those metals standards beginning with the 2018 assessment.*

DWR will be going to the Environmental Management Commission to seek approval to put the 2018 Listing and Assessment Methodology out for public comment and will encourage feedback and suggestions for listing and assessment methods for the revised metals water quality standards. DWR Water Sciences Section is also working to incorporate the dissolved metals sampling procedures into the SOP for physical and chemical sampling and will share the draft SOP with the City of Durham.

Water quality in two City of Durham creeks appears to have improved since the assessment period. Dissolved oxygen in Third Fork Creek in the later years of the assessment period improved and suggests that the creek should be reassessed. Third Fork Creek from a point 2.0 miles upstream of NC Hwy 54 to New Hope Creek (Assessment unit 16-41-1-12-(2)) is sampled by the Upper Cape Fear River Basin Association (UCFRBA) at station B3025000. Data collected by UCFRBA during the assessment period 2010-2014, only years 2013 and 2014 have met state standards for DO. The City of Durham monitors water quality in Third Fork Creek at Hwy 751 south of Hwy 54 and north of I-40 (TF0.0TC). This monitoring station is less than 1 mile downstream of B3025000 and approximately 0.5 miles upstream of where New Hope Creek connects. During the assessment period 2010-2014, DO at TF0.0TC has consistently met state standard from 2011 through 2014, and in 2015.

DWR Response: *DWR will reassess Third Fork dissolved oxygen levels for the 2018 water quality assessment. The City of Durham can submit data through the data submittal process. Additionally, DWR would be interested in hearing about the efforts that may have aided in improving the water quality in this segment.*

Ellerbe Creek, from a point 0.2 mile upstream of Durham County SR 1336 to Falls Lake (Assessment unit 27-5-(2)), should be reassessed for benthic macroinvertebrate (benthos) community impairment during the next 303(d) list assessment period. Ellerbe Creek was listed as impaired for benthos in 2008. Benthos data collected by the City in 2015 has shown an improvement in the biotic rating. The biotic rating was "Good/Fair" in 2015.

DWR Response*: DWR has not assessed benthos in Ellerbe Creek since 2000. The City of Durham can submit data through the data submittal process to be used for the 2018 assessment. Additionally, DWR would be interested in hearing about the water quality improvement activities that may have improved*

benthos community ratings in Ellerbe Creek over the past 15 years. This would certainly make a success story, as the creek has rated poor since 1985.

Comment Source: Dan McLawhorn - Lower Neuse Basin Association / Neuse River Compliance Association

LNBA and NRCA Comments and Concerns on the DWR Draft 2016 303(d) list and the preparation of the 305(b) report which when combined are often called the Integrated Water Quality Assessment Report:

1) The Neuse River estuary was listed on the 303(d) list and subsequently a TMDL was developed by the state and eventually approved by EPA in 2002. The TMDL was designed to achieve the standard for chlorophyll a and the NPDES point sources have collectively achieved nutrient load reductions to sustain the attainment of that water quality standard. However, under the TMDL the Neuse River Estuary is no longer on the 303(d) list. Therefore, the pending Integrated Report (IR) list is of great interest to the LNBA. We suggest that the IR be made available to the public for comment. We obtained Neuse River Basin water quality assessment Fact Sheets from DWR staff to assist in the construction of our comments. These Fact Sheets were most helpful as was the new web based assessment mapping tools.

***DWR Response**: The comment period was for the 303(d) list which is category 5 of the Integrated Report. However, other draft Integrated Report assessments were provided by DWR staff in assessment Fact Sheets upon request. DWR is working to have the full Integrated Report available in a map and draft list for 2018. Upon EPA final approval of the 2016 303(d) list, DWR will post the entire Integrated Report on the website.*

2) The LNBA/NRCA and our members have actively participated in the state's development of the 303(d) listing methodology and we support the EMC's decision to include a confidence factor as part of the listing methodology because the risk and consequences of DWR's 303(d) decisions make it essential that our citizens have a high degree of confidence that actual water quality problems are documented. Therefore, the LNBA requests DWR to consider the potential consequences of its listing decisions before making unnecessary additions to these reports. We generally support the EMC's adoption of water quality 303(d) listing methods that realistically evaluate water quality impairment assessments in N.C. This is in concert with the authority of the EMC provided by NC General Statutes. Consistent with this overall comment we would like to draw your attention specifically to our comments on the chlorophyll a sampling methodology. The LNBA/NRCA remains interested in the methods DWR intends to use for determining the successful attainment of water quality standards under the Neuse TMDL and other regulatory management strategies. Our comment number 10 provides an example for consideration. Using this DWR proposed scenario, one station location JA112 (using non-standardized collection methods) with 7 observations exceeding the chlorophyll a standard seems to overrule the collective results from 5 stations with 294 total observations.

***DWR Response**: This water is not on the 303(d) list. However, this comment is on the 305(b) component of the Integrated Report and we will further evaluate the specific concerns regarding non- 303(d) assessments.*

3) At our request DWR provided detailed fact sheets on the Neuse River Basin that helped to clarify who contributed data to the assessment process. The fact sheets are very helpful and provide a level of detail that greatly enhances the assessment understanding. DWR staff should be commended for providing this information in a timely manner. It is unfortunate that the process does not consider the magnitude of values above the water quality standard, only the frequency of

exceeding the standard. Thus, waterbodies with a 15% exceedance frequency are rated the same even if one water body exceeded the standard value by 300% and the other waterbody exceeded the standard by 1%.

***DWR Response**: The Environmental Management Commission (EMC) methodology does not consider magnitude of exceedances. DWR will be going to the EMC to seek approval to put the 2018 Listing and Assessment Methodology out for public comment and will encourage feedback and suggestions for listing and assessment methods for the newly revised metals water quality standards.*

4) Benthic Macroinvertebrate monitoring for aquatic life support assessment is at times based on a single sample. Monitoring strategies and field work schedules should be developed and prioritized to revisit all locations with a single impaired sample prior to the conclusion of the five year assessment window. This would greatly increase the confidence of a 303(d) determination. If the two biological assessments do not agree then the water segment could be placed in category 3.

***DWR Response**: DWR has employed this "follow-up" method in the past and found that it rarely changed the original assessment. DWR considers one sample valid for biological monitoring because the communities integrate stressors over time and provide a direct measure of fluctuating environmental conditions. DWR staff have provided follow up sampling on a case by case basis. With fewer resources available, DWR has had to make decisions in order to place benthos assessment stations statewide.*

5) There is only one new listing for the 2016 draft 303(d) report in the Neuse Basin downstream of Falls of the Neuse Reservoir. This listing is for Little Swamp from source to Contentnea Creek segment 27-86-5.2. The segment is listed for non-attainment of the dissolved oxygen water quality standard. It is suggested that DWR review the classification for this stream segment as it is not classified as Swamp waters despite the name of the stream.

***DWR Response**: Little Swamp will be evaluated using natural conditions assessment prior to any TMDL or restoration plan development. However, there are very few exceedances of the low-pH standard, which indicates that the low DO may be from sources other than natural.*

6) There are a number of stream segments proposed for 303(d) delisting in the Neuse River Basin. The LNBA/NRCA are familiar with the state's new metals water quality standards effective January 1, 2015. However, it has now been over a year since the North Carolina effective date and EPA has yet to act on the approval or disapproval of the water quality standards for NPDES purposes. Are the proposed draft 2016 303(d) delistings for metals related to a decision by EPA? The LNBA and the NRCA are highly interested in any NPDES decisions related to the enforcement of the new metals standards and would appreciate an opportunity to hear from the DWR on the status of these related issues.

***DWR Response**: The data window for the 2016 303(d) list ended on Dec 31, 2014 and thus does not include the revised metals standards adopted January 1, 2015. The proposed draft delistings for metals into category 1 were based on the total metals standards in 15A NCAC 02B (May 2007) and current EMC assessment methods.*

7) The 2016 Neuse River Basin Fact Sheets indicated that segment 27-34-(1.5) Walnut Creek (Lake Johnson) was listed in Category 3a – for chlorophyll a. However, with a total of two locations and ten samples and only 1>40ug/L why is this lake not considered in Category 1 – meeting criteria?

Station	Parameter	N	N>EL
NEU042C	Chla	5	1
NEU0431A	Chla	5	0

***DWR Response**: This water is not on the 303(d) list. However, this comment is on the 305(b) component of the Integrated Report and we will further evaluate the specific concerns regarding non-303(d) assessments.*

8) The LNBA/NRCA was pleased to see the progress of segment 27-97-5-3 Creeping Swamp from the source to Clayroot Swamp in attaining the water quality standard for chlorophyll a. In the 2014 water quality assessment this was placed in category 3a1 and in the 2016 fact sheets this was placed in category 1 – meeting the water quality standard based on the following information:

Station	Parameter	N	N>EL	% >EL
J8150000	Chla	56	5	8.9

***DWR Response**: DWR would be interested in finding out if any implementation activities in this area may be associated with this improvement.*

9) The Neuse River Estuary - The LNBA/NRCA would like to offer a number of general comments on the Neuse River Estuary and the apparent departure from the established sampling and reporting methodology used by the DWR in making listing decisions as related to the attainment of the water quality standard for chlorophyll a. The LNBA/NRCA request DWR to reexamine the analysis of the entire Neuse Estuary based on these comments. As the Neuse River Estuary is no longer listed on the 303(d) list because of a TMDL management strategy DWR has ample time to review these comments and evaluate their water quality assessments for the IR and fact sheets appropriately.

Neuse River Estuary Station Identifiers

Conducting a careful review of the assessments in the Neuse River estuary has been difficult for the 2016 reporting cycle. To the best of our knowledge, this is the second cycle to include chlorophyll a data assessments from the NCSU CAAE program. Unfortunately, the LNBA did not have access to an approved NCSU QAPP for the 2014 cycle in order to review sampling methods. The 2016 fact sheets requested from DWR included DWR ambient monitoring data, LNBA data, UNC IMS ModMon data, and NCSU CAAE data as well as a 2016 QAPP from NSCU. Several issues made this review a bit challenging. Station summaries did not maintain the station nomenclature integrity used by the sampling agency. Different station locations of the UNC ModMon program were merged (obliterated) into the same station names as the DWR ambient monitoring program as locations were in “close proximity”. ModMon station identifiers like “50” or “30” were altered into DWR location station nomenclature like J8290000. This practice made it extremely difficult to identify which data was contributed by which agency. A careful review of the NCSU CAAE data used by the DWR analyst was difficult because of inconsistent use of station identifiers. Sometimes stations were identified by the descriptors used in the NCSU CAAE QAPP – for example: BOA, BOM, FSH, 37, BRD, 35, CHM, 34, 33, CLP, BB2, JPM, MB2,RR1. However, DWR staff altered these station names using replacement numbers like JA100, JA101, JA102, JA103, JA104, JA105, JA107, JA108, JA110, JA111, JA112, JA113, JA114, JA115, JA116. At other times DWR altered stations numbers and incorporated sampling methods like 33U, 33L, 34U, 34L, 35U, 35L, BB2I, etc. Station numbering is

critically important because there is the possibility of extreme differences in sampling methodology between agencies. The ModMon program collects chlorophyll a samples in a number of different ways including surface grabs, bottom grabs, and a photic zone composite (which is consistent with the statewide DWR practice of more than 35 years). It appears that only UNC ModMon photic zone samples were used but it is difficult to be absolutely sure that DWR data analyst did not use ModMon data from grab samples in this analysis because ModMon stations were not distinguished from DWR locations.

Methodology Chlorophyll a sampling of the photic zone
The 2014 reporting cycle included assessment data for chlorophyll a from the LNBA, the DWR, and the ModMon program all based on the assessment of the photic zone. All of these programs use a collection method that composites the water column of the entire photic zone as defined as a depth of twice the secchi value. Although DWR utilized NCSU CAAE monitoring in the Neuse estuary for the 2014 water quality assessment the January 2016 NCSU QAPP indicated that NCSU did not utilize a sample collection method consistent with the DWR and UNC IMS ModMon practice of collecting a composite sample of the entire photic zone. This long standing DWR standard method (35+ years) has been consistent across the state for both lakes and estuaries. The NCSU CAAE program is designed with a station specific sampling approach for chlorophyll a according to their 2016 QAPP. NCSU CAAE collects chlorophyll a samples in the Neuse using a unique station specific method identified as Upper/Lower/Integrated (U/L/I) Water Column. At each field collection site, a 3 meter water column tube sampler is lowered into the water column with a side-arm ball valve closed until the top of the sampler is just at the surface or sooner depending on site depth. A water sample is then transferred into a water pitcher. A release valve then allows the lower 1.5 meters of the water column to go into the 'lower' pitcher and the remaining 1.5 meters of the column sampler goes into the 'upper' pitcher. In shallow water (<1.5 m) a single integrated column sample– no upper or lower is collected. Sampling depth is not adjusted based on the photic zone as indicated by secchi depth. This method does not appear to be consistent with the long established DWR photic zone standard collection practice for all lakes and estuaries. Nor is it consistent with the UNC IMS ModMon photic zone sample. It remains uncertain if DWR used IMS ModMon surface chlorophyll samples for the 2016 draft assessment. But at the end of the day, after deciphering all of the NCSU CAAE data it appears that DWR used chlorophyll a data from the "upper" half of the water column sampler and at other locations used a single integrated sample if the station was 1.5 meters deep or less. It appears that DWR did not use the chlorophyll a data from the lower half of the column sample at locations where the water column was split into two samples.

The relative quantitative effect on any differences this method may have with chlorophyll a concentration values is unknown. CAAE may have very good reasons for this sampling methodology but DWR should consider if this methodology should be used to establish testing criteria for the chlorophyll a water quality standard for 303(d) purposes. NCSU CAAE data collected as a composite of the entire photic zone would be a beneficial addition to the review of standards attainment. There is sufficient data in the Neuse Estuary for determining the attainment of the water quality standard for chlorophyll a using the decades old standard collection practice of a composite of the photic zone. Opening the opportunity to alter the standard collection practice creates a potentially unmanageable number of options with unknown effects. That is why there is a standard collection practice.

Significant Figures

Chlorophyll a results reported beyond the decimal place should not be utilized for comparison to the water quality standard. The laboratory methods for reporting results beyond the decimal place do not have the precision and accuracy to support this decision. The PQL for this procedure is 1ug/L. Thus results of 40.0ug/L, 40.4ug/L, and 40.3ug/L should NOT be considered exceeding the WQS for purposes of 303(d) and IR. DWR calculations did include this error in their quantification. This error has been made on DWR laboratory data as well as data reported by UNC IMS. These reporting errors should not be compounded and magnified through the use of decimal places to count standard exceedances. Regardless of the source of the data chlorophyll a values of 40.1, 40.2, 40.3, 40.4 etc should not be considered exceedances of the standard. This comment is further supported by the DWR laboratory SOP for chlorophyll a as follows: Report as µg chlorophyll a/L by EPA Method 445.0 modified option.

12.6.1 Report results < 1 µg chlorophyll a/L as 1 U.

12.6.2 Report results >1.0 and <10 µg chlorophyll a/L to the nearest tenth (0.1 ug).

12.6.3 Report results >10 µg chlorophyll a/L results to two significant figures.

***DWR Response**: These comments are not related to waters on the 303(d) list. DWR acknowledges that station numbering is difficult with multiple parties monitoring both co-located and closely located areas of the estuary. DWR will work with the various parties to develop a single station identification system in the estuary and to better identify which party collects which data.*

DWR is already working to standardize chlorophyll-a data collection so that the same method is used at all stations for assessment purposes. In response to this comment, DWR has removed third party data that was collected outside of DWRs SOP from listing determinations and will work to improve communication of the data requirements for future Integrated Reports.

In regards to significant figures, DWR will work with all agencies to standardize the reporting with regards to significant figures. In response to this comment, DWR reassessed the data by rounding all data reported with a decimal place. Therefore, any data reported below 40.5 were rounded to 40 and not considered as an exceedence.

10) Segment 27-(96)b1 Neuse River Estuary From Bachelor Creek to the Trent River (River and part of Upper Model segment). In the 2014 water quality assessment this was placed in Category 1t-meeting the water quality standard for chlorophyll a. The DWR 2016 fact sheets change this to Category 3t. This appears to be in error. There are 212 observations for chlorophyll a in this segment using the photic zone standard method. Fifteen of these or 7% exceed the criteria. This segment should be placed in Category 1. Even if you include the NCSU non-standard collection methods there are 294 total observations with 25 exceeding = 8.5%. The 2016 Category 3t listing is likely an error.

Did DWR place this in category 3 because of a single NCSU CAAE station using non-standard collection methods? If so, why do we even have segments?

Station	Parameter	N	N>EL	% >EL	Conf
JA112	Chla	52	7	13	0.738 NCSU
RR1	Chla	30	3	10	0.411 NCSU
J8290000	Chla	55	2	3.6	0.022
J8570000	Chla_IWS	102	8	7.8	0.188
J8570000	Chla	55	5	9	0.344

***DWR Response**: This water is not on the 303(d) list. Both NCSU stations in this AU were collected using the standard collection method (integrated sample from twice the Secchi depth). However, this comment is on the 305(b) component of the Integrated Report and we will further evaluate the specific concerns regarding non- 303(d) assessments.*

11) Segment 27-(104)b Neuse River Estuary From a line across Neuse River from 1.2 miles upstream of Slocum Creek to 0.5 miles upstream of Beard Creek to a line across Neuse River from Wilkinson Point to Cherry Point (bend model segment) the 2014 assessment listed this in Category 1t. The 2016 assessment listed this in Category 4t – a significant change in status for chlorophyll a. The assessment appears to have used no Chlorophyll data from station J9431500 or J8925000. All locations listed on the fact sheet in this segment are based on NCSU stations. Are there no ModMon or DWR locations with chlorophyll a data in this segment? Perhaps ModMon location 120 is in this segment as well as J9530000. It is suggested that this segment needs additional review by DWR.

Station	Parameter	N	N>EL	% >EL	Conf	
JA104	Chla	80	14	17.5	0.973	NCSU
JA100	Chla	82	9	10.9	0.562	NCSU
JA111	Chla	81	15	18.5	0.986	NCSU
JA101	Chla	81	13	16.0	0.941	NCSU
JA107	Chla	78	15	19.2	0.990	NCSU

***DWR Response**: This water is not on the 303(d) list. 27-(104)b chlorophyll-a assessment remains in category 4t based on data from CAAE station JA101 (BRD) and MODMON station J953000 (MM120). Other stations in the AU with chlorophyll-a collected from the upper and lower water column were not used for assessment (stations JA104, JA100, JA111, and JA107).*

12) Segment 27-(118)a1 Neuse River Estuary From a line across Neuse River from Wilkinson Point to Cherry Point to a line across the river From Adams Creek to Wiggins Point (part of lower model segment) This segment was Category 1t in 2014 and now in 2016 is found in Category 4t. Recall the comment about counting decimal places as exceeding criteria. Edits are shown in this case as an example strike thru.

Station	Parameter	N	N>EL	% >EL	Conf
J9530000	Chla	52	7	13.4	0.738
J9530000	Chla_IWS	101	~~22~~ 20	~~21.7~~ 19.8	1.000

Again we should not loose collector integrity by joining divergent data sets under the same station numbers. Review of ModMon data from station 120 suggest a count of 101 chlorophyll a samples collected by photic zone composite with 20 samples >40. Here the number of observations exceeding the standard count does not include two values of 40.417, 40.347 which were obviously included by DWR as exceeding the chlorophyll a standard. This is an insignificant error made by DWR – or perhaps their programming. Perhaps an esoteric error in this case but an error non-the-less. Perhaps it is not esoteric in other cases. Laboratories may be reporting three significant figures beyond the analytical limits of this test. The limit of reporting should be 1ug/L. There should be no decimals after the 40 and thus these two observations and perhaps others at other locations are not an exceedance of the 40ug/L standard. It appears DWR is counting these decimal places in order to maximize the number of exceedances in an inappropriate manner.

***DWR Response**: Thank you for highlighting this reporting error. DWR programing ran counts on exceedances >40 on all datasets. DWR data are reported without decimal places. DWR re-ran the analysis using >40 after rounding values between 40 and 41. The assessment determination has not changed based on this reanalysis of the data set.*

Comment Source: Will Hendrick - Southern Environmental Law Center

The Southern Environmental Law Center appreciates the opportunity to comment on the above-referenced list on behalf of American Rivers, the Catawba Riverkeeper Foundation, Cape Fear River Watch, the Haw River Assembly, the North Carolina Chapter of the Sierra Club, the River Guardian Foundation, Sound Rivers, the Winyah Rivers Foundation, and the Waterkeeper Alliance. The following comments object to the State's continued defiance of recommendations made by the U.S. Environmental Protection Agency (EPA), identify examples of objectionable proposed listing decisions, and suggest revisions to the draft 2016 §303(d) list.

I. The Clean Water Act and the § 303(d) List: Combating Water Pollution

The goal of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To achieve this goal, the Act requires the establishment of direct limitations on the discharge of pollutants—i.e., "effluent limitations," provides for the issuance of permits incorporating these limitations, and forbids the discharge of pollutants without such a permit. The Act also recognizes the need for additional protective measures when effluent limitations prove insufficient to ensure water quality. Accordingly, every two years, each state is required by Section 303(d) of the Act to identify waters within its jurisdiction for which required effluent limitations are insufficiently stringent to implement applicable water quality standards. The resulting compilation of impaired waters is known as the "303(d) list." Once these waters are identified as impaired, the Act requires the state to establish a total maximum daily load ("TMDL") to further limit the presence of the pollutant or pollutants that cause the impairment.

Thus, the proper identification of impaired waters and the prompt development of responsive TMDLs are essential to improving the quality, and preserving the best use, of the State's waters. Unfortunately, the draft 303(d) list proposed by North Carolina fails to identify properly the State's impaired waters or ensure the development and implementation of necessary TMDLs. Contrary to EPA guidance, the State continues to employ a listing methodology that under-identifies impaired waters and thereby deprives North Carolina's waters of the additional protection required by the Act. Of particular concern is the use of an objectionable methodology to assess impairment by toxic pollutants, since "control of toxic pollutants in surface waters is an important priority to achieve the Clean Water Act's goals and objectives."

II. An Indefensible Listing Methodology for Toxic Pollutants

In North Carolina, the Environmental Management Commission (EMC) is statutorily required to "implement the provisions of subsections (d) and (e) of 33 U.S.C. § 1313 [Clean Water Act §303] by identifying and prioritizing impaired waters and by developing appropriate total maximum daily loads of pollutants for those impaired waters." Fortunately, the United State Environmental Protection Agency ("EPA") reviews the list drafted by the State. "The EPA's review of the North Carolina section 303(d) list ensures that the list identifies water quality limited segments consistent with existing State standards."

In previous years, EPA has questioned the methodology approved by the EMC to create the 303(d) list and repeatedly expressed reservations about how the State assesses attainment of numeric water quality standards. Prior to 2013, 303(d) listing decisions related to numeric water quality standards were made using the "10% rule": if more than 10% of samples exceeded the numeric standard for a specific pollutant, the water body was listed as impaired by that pollutant, as long as at least 10 samples were

taken within the assessment period. EPA has consistently warned against using the 10% rule to assess attainment of numeric water quality standards for toxic substances.

For toxic pollutants, EPA guidance recommends use of the 1-in-3 rule: if more than 1 sample collected in a water body during any three year period shows an exceedance of the numeric standards for a toxic pollutant, the water body should be included on the 303(d) list.13 According to EPA, "[i]n the case of aquatic life, more frequent violations . . . would result in diminished vitality of stream ecosystem characteristics by the loss of desired species." Notwithstanding, North Carolina has refused to employ the 1-in-3 rule to assess impairment by toxic pollutants.

"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 EPA's recommended water quality standards." In 2010, EPA "reviewed the justification North Carolina submitted supporting its listing methodology for toxic and non-conventional pollutants" and the agency stated it "does not believe the State has demonstrated that the ten percent frequency methodology for toxics is no less stringent that the 1-in-3 frequency methodology recommended in EPA's assessment guidance." EPA also objected in 2012 to North Carolina's use of the 10% rule in the assessment methodology for toxic pollutants. EPA once again expressly stated that North Carolina had failed to "demonstrate that the ten percent frequency methodology for toxics is no less stringent than the 1-in-3 frequency methodology recommended in EPA's assessment guidance."

The EMC had an opportunity, when adopting a new methodology for use in crafting the 2014 303(d) list, to fix the problems with the 10% rule. Instead, the EMC approved a listing methodology that was even more objectionable because it employed a 90% statistical confidence component. Under the new methodology, even more samples showing exceedance of water quality standards are necessary for the State to recognize impairment. The EMC sought to defend this approach by referencing a similar listing methodology employed by Florida, claiming the change was necessary to "provide more statistical confidence that standards were exceeded in at least 10 percent of samples by taking sample size into account." However, EPA observed that Florida's use of a statistical confidence measure was necessary "to account for uncertainty in data quality" and noted that "in North Carolina, data validity is ensured through consistent use of standard operating procedures and rigorous quality assurance and quality control processes." In light of the "different circumstances in North Carolina," the EPA emphasized that the federal agency "does not agree with the use of a ten percent exceedance approach with ninety percent confidence for metals use support assessment."

When EPA conducted an independent assessment, using a scientifically defensible listing methodology to assess impairment by toxic and non-conventional pollutants, the result was dramatic: 51 waters were added to North Carolina's 303(d) list.

III. NC Should Not Make Listing Decisions Based on a Repeatedly Rejected Methodology

Notwithstanding, North Carolina employed the same methodology to draft the 2016 list as the one rejected in 2014. The State continued to ignore EPA's concerns about the use of the 10% rule and the new requirement of 90% statistical confidence to assess impairment for toxic pollutants. The State now proposes to de-list 47 of the 51 water bodies that EPA re-listed in 2014. And, in a remarkable show of defiance, the State claims each of these de-listings is justified because the previous listing (i.e., the one commanded by EPA) was "inconsistent with the assessment methodology." DEQ's disagreement with EPA does not constitute "good cause" for removing these waters from the 303(d) list.

Indeed, according to the EPA, "[w]aters should generally remain in Category 5 until a TMDL is established unless there is reason to believe that conditions that led to the initial listing have changed (WQSs are attained, actions justifying inclusion in Category 4, etc.), or that the basis for the initial listing was in error." The State has offered no argument that the conditions that led to the listing have changed for any of the 47 water bodies proposed to be de-listed.

Indeed, for most of the water bodies in question, the State has not collected the data necessary to make such a determination. Apparently, the only justification provided for de-listing was that EMC refused to accept the EPA's decision. North Carolina should not move these waters from Category 5 to Category 3 when the State's only justification is its persistent disagreement with the federal agency authorized to review and approve the list.

In addition, we recommend that the State re-evaluate data samples collected for toxic pollutants and, where possible, apply the federally recommended, scientifically defensible 1-in-3 rule. A comprehensive evaluation is impossible to conduct on the basis of the data made publicly available by the State, which only appears to report the concentration of toxic pollutants in samples collected in 2013 and 2014. Regardless, the citizens of North Carolina should not be forced to rely on EPA to protect North Carolina's waters; that should be the priority of the State environmental agency.

IV. Conclusion and Recommendations for Improvement

As detailed above, the methodology used by North Carolina to create the draft 303(d) list is deeply flawed and has resulted in numerous unjustified proposed de-listings. To prevent such harmful decisions in the future, the EMC should formally delegate to DWR the responsibility for developing the listing methodology. This will increase the likelihood that scientific expertise informs the identification of waters in need of additional pollution protection.

Regardless of who develops the methodology, it should be substantially revised. When assessing compliance with numeric water quality criteria expressed as maximum levels, the preferred methodology, according to the EPA, is the 1-in-3 frequency method. If, instead, the State wishes to continue use of the 10% rule, it should at least follow EPA guidance, which cautions that the 10% rule should not be applied to assess impairment by toxics and other non- conventional pollutants.

If the State insists on retaining its current methodology, it must, at a minimum, proffer an acceptable scientific defense for its continued defiance of EPA. Specifically, the State should explain to EPA and the public why it believes the application of the methodology constitutes good cause for making listing decisions that define the level of protection afforded to North Carolina's waters. Because EPA has rejected all previous attempts to justify use of the methodology to assess impairment by toxics, all waters removed from the list for no other reason than the application of the rejected methodology should be returned to the 303(d) list and afforded the protection contemplated for such impaired waters under the Clean Water Act.

DWR Response: *DWR followed the Environmental Management Commission (EMC) approved methodology for assessment. In the 2016 303(d) submittal package to EPA, DWR has provided a document "Water Quality Assessment Methods for Toxics" which raises concerns with using the >1 in 3 method for metals assessments.*

DWR will be going to the EMC to seek approval to put the 2018 Listing and Assessment Methodology out for public comment and will encourage feedback and suggestions for listing and assessment methods for the newly revised metals water quality standards.

Comment Source: Pam Hemminger - Upper Neuse River Basin Association

1. The UNRBA is concerned with the 303(d) new listing of 27-12-(0.7)b Beaverdam Reservoir to the list of waters impaired by chlorophyll a needing a TMDL or management strategy. As a result, the UNRBA believes that it is unnecessary to divide assessment unit 27-12-(0.7) and it is inappropriate to list the lower reservoir as impaired. The Beaverdam Reservoir and its drainage is already covered under the Falls Lake Nutrient Management Strategy.

   The NC Draft 303(d) list indicates Beaverdam Reservoir segment 27-12-(0.7) has now been split into two segments 27-12-(0.7)a and 27-12-(0.7)b. This split was apparently based on the proposed impairment of the lower Beaverdam Reservoir for chlorophyll a. This proposed change is based on data collected by NCSU's Center for Applied Aquatic Ecology (CAAE) at one location. A review of the data for this location indicates samples were collected using protocols not consistent with DWR standard collection methods for chlorophyll a for lakes and estuaries. DWR has established a sampling protocol of collecting chlorophyll a samples using an integrated water column sample of the entire photic zone collected over a depth composite equal to twice the depth of the recorded secchi value. This 35+ year old collection method was developed so that consistent collection methods could be applied across the entire state for both estuaries and lakes. This approach allows for consistent evaluation of the water quality standard for chlorophyll a and to establish the relative trophic classification of the state's waters under the CWA Section 314. The DWR standard collection method using a composite sample of the entire photic zone is consistent with the USEPA National Assessment of Lakes field manual of 2012.

   The results being used by the Division for its proposed listing of lower Beaverdam Reservoir were collected using a composite sample of the water column reflecting only the upper photic zone. These samples are labeled UPZ on data values utilized by DWR. Only chlorophyll a samples conforming to the standard collection method of water column integrated composites of the entire photic zone (twice-secchi depth) should be considered for the 303(d) and IR categorical listings. It should be noted that most NCSU CAAE sampling locations within Falls Lake are collected consistent with the DWR entire photic zone (twice-secchi) standard protocol. We support use of data generated using the established standard full photic zone protocol.

   The use of data collected using alternate sampling procedures for use-support determinations would be an unevaluated "mixing" of results. To our knowledge there has not been an analysis of the impacts of using data generated by this alternate sampling protocol, nor any consideration of the potential for significantly different results using the alternate procedure as compared with those produced from the established protocol. The UNRBA believes that it would be prudent to exclude this data at this time. If future application of this data is to be considered, we recommend that a careful evaluation of the impact of its inclusion for important standard compliance and use-support assessments be completed and reviewed by the interested public before any specific agency decision is made. The NCSU CAAE collection methods are site specific and project specific as indicated in their 2016 QAAP. The actual chlorophyll a results are certainly valid and can be used for research and evaluation purposes other than regulatory use-support decisions.

   An additional consideration in the use of this data is sample location. Based on the information available, samples taken at this location are apparently collected from a near shore pier. For 303(d) and IR purposes we recommend that DWR avoid making listing decisions using "near shore"

sampling results or from areas affected by physical obstructions to free water circulation as these areas are not typically representative of larger waterbodies.

It is our understanding that DWR has scheduled Beaverdam Reservoir for water quality monitoring and trophic evaluation this year. This evaluation will be performed using standardized methods at multiple locations consistent with DWR protocols.

DWR Response: *DWR agrees that using data collected using Standard Operating Procedures (SOPs) that differ from DWRs own SOP can lead to inappropriate listings. DWR has removed third party data that was collected outside of DWRs SOP from listing determinations and will work to improve communication of the data requirements for future lists. Monitoring of Beaverdam Reservoir is scheduled for 2016, DWR will evaluate the results of this monitoring during the 2018 assessment.*

2. It is recognized that DWR and the NCSU CAAE and other certified laboratories and researchers have well qualified staff and well-qualified certified laboratories for chlorophyll a analysis. However, chlorophyll a results reported beyond the decimal place should not be utilized for comparison to the water quality standard. The laboratory methods for reporting results beyond the decimal place do not have the precision and accuracy to support this decision. The PQL for this procedure is 1ug/L. Thus results of 40.0ug/L, 40.4ug/L, and 40.3ug/L should not be considered exceeding the standard for purposes of 303(d) and IR. The UNRBA review indicates DWR calculations did include these values in their quantification. This has been done with DWR laboratory data as well. Regardless of the source of the data, chlorophyll a values of 40.1, 40.2, 40.4 etc should not be considered exceedances. This comment is further supported by the DWR laboratory SOP for chlorophyll a as follows:

   Report as µg chlorophyll a/L by EPA Method 445.0 modified option.
   12.6.1 Report results < 1 µg chlorophyll a/L as 1 U.
   12.6.2 Report results >1.0 and <10 µg chlorophyll a/L to the nearest tenth (0.1 ug).
   12.6.3 Report results >10 µg chlorophyll a/L results to two significant figures

DWR Response: *DWR will work with reporting agencies to ensure uniformity of reporting.*

3. The UNRBA endorses the use of NCSU CAAE chlorophyll a samples collected at locations FL1C, FL6C, FL7C, FL8C, FL9C, FL10C, FL11C, FLINC, FL50C, FL85C, LC1, and LC2. Based on our review this data was not collected from shore and is collected as a photic zone composite sample as describes in the CAAE QAPP January 2016. Please see discussion in item 1 for additional background on this comment.

DWR Response: *Thank you, DWR agrees with this comment.*

4. For purposes of 303(d) and IR listings the UNRBA is concerned with using NCSU CAAE chlorophyll a data from locations FL1, FL2, FL3, FL4, FL5, FL6, RV1, and RV2 because these collections for chlorophyll a do not use a composite water column of the entire photic zone (twice-secchi depth). NCSU CAAE sampling collection practices for these specific locations in Falls Lake for chlorophyll a are not consistent DWR established collection methods using a composite of the photic zone defined as a depth integrated sample of twice-secchi (see item 1 for additional discussion). Chlorophyll a data from these specific locations may provide valuable information for modeling or purposes other than listing of impaired waters. However, as noted in item 1, the UNRBA believes

that before using this data for standard compliance and use-support decisions, DWR should evaluate the impacts of this sample collection protocol on these important regulatory decisions and carefully vet any proposed change by those affected by such a change.

DWR Response: *See response to comment #1 above.*

5. The UNRBA objects to the proposed additional segmentation of Segment 27-(5.5)b4 Falls Lake From Lick Creek Arm to Falls Dam. The critically important reasons for this position is that it is inappropriate due to the extensive efforts underway to implement the Falls Lake Rules, the compliance provision of the Falls Lake Rules, the extensive work underway to reexamine the nutrient strategy and the physical characteristics of the reservoir.

   As a practical consideration, the UNRBA is making extensive efforts are to re-examine the entire Falls Lake strategy. Also, the jurisdictions in the watershed have implemented the New Development requirements and are in the midst of implementing Stage I Existing Development. These actions by themselves argue strongly against revision of the use-support segment in the lower part of the reservoir at this time. Clearly, change isn't appropriate while these important activities are underway. Because of the compliance provisions of the Falls Lake Rules, it is completely inappropriate to consider re-segmentation of this portion of the reservoir at this time.

   The proposed change unnecessarily divides this one existing segment into 5 different segments. This change may be based on the inaugural use of NCSU CAAE chlorophyll a data from Falls Lake for 303(d) and IR listing purposes. The UNRBA acknowledges the efficacy of considering all availability data collected using established protocols and covered under an agency-approved QAPP from Falls Lake. The UNRBA recognizes that with the additional monitoring results there is an abundance of data for this segment. However, the lower Falls Lake is very narrow and constrained, representing essentially a riverine system. There is no strong physical characteristic change basis for breaking up this segment into multiple assessment areas.

   There are 11 sampling locations appropriate for consideration in this segment. This is a robust dataset. Assessment determinations should certainly be supplemented by this robust dataset as applied to segment 27-(5.5)b4, but should not be used to splinter the assessment segments in the lower lake. Specifically, just because of additional data or perhaps even new locations it is not appropriate to over-segment this assessment unit.

   Current assessment Unit 27-(5.5)b4 was apparently not broken into additional segments because of limnology, hydrodynamics, or geography. The existing segment designation is harmonious with the Falls Rules implementation strategy. It should remain intact while the UNRBA is evaluating the most effective management strategies for the lake and its watershed. In the meantime, the UNRBA is conducting the most aggressive and intensive examination of nutrient dynamics in any reservoir in NC. UNRBA reexamination results and the extensive analysis and knowledge gained by this effort may provide a basis for evaluating use-support assessment units, but it is not appropriate at this time.

DWR Response: *Since these waters are not on the 303(d) list, this is a comment on the 305(b) component of the Integrated Report. The segmentation changes proposed were reflective of the standard assessment procedure. That is, when data indicate differences in water quality between*

monitoring stations, assessments are made for each station independently and new assessment units are established if needed.

However, DWR recognizes that the UNRBA and other stakeholders are expending significant effort to comply with the Falls Lake Rules, which clearly describes compliance segmentation. DWR will work with the stakeholders to address specific concerns. The result of these discussions will be reflected in the final 2016 Integrated Report, which will be finalized by DWR following EPA's action on the draft 303(d) list.

Comment Source: Will Scott - Yadkin Riverkeeper

I. History of Delisting Copper Impaired Waterbodies:

Over the past two section 303(d) listing cycles EPA has questioned the State's assessment methodology for toxics and decision to delist copper impaired waterbodies in the Yadkin Pee Dee River Basin. Before "the 2008 303(d) list cycle, North Carolina was not consistently assessing for impairments of metals, particularly 'action level' metals, i.e., copper and zinc." It was not until 2010 that "limited metals monitoring was resumed[,] … [albeit leaving] the 2012 and 2014 cycles … [with] very little new metals data." Yet, even with little data, "EPA's independent assessment of metals data for the 2008 and 2010 lists … resulted in a list of 23 waterbody-pollutant combinations requiring further investigation for potential impairments of copper and/or zinc." For one waterbody in 2012 "the State failed to adequately demonstrate good cause for delisting of the copper impairment" because EPA found "DWQ's methodology (> 10% exceedance) is not consistent with EPA guidance (>one-exceedance-in-3 years)."

II. History of Issues with Assessment Methodology:

While DWR modified its methodology after the 2012 listing cycle, EPA's 2014 response to the State's 303(d) list reiterated that "EPA is not satisfied that the State's methodology for toxics properly implements the currently applicable water quality standards." As evidence to the insufficiency of DWR's assessment methodology, an EPA independent assessment revealed that the State failed to list 51 waterbody-pollutant combinations in 2014, because EPA did not find DWR's change in assessment methodology a sufficient reason to delist. Now in 2016, DWR proposes to delist copper impaired waterbodies in the Yadkin Pee Dee River Basin which "are all metals that EPA added back to the 2014 303(d) list" because the listings were "not consistent with the EMC approved method[.]"
Empirically, EPA has "consistently communicated … reservations about the 10% frequency to the state and provided opportunities to suggest alternatives for many 303(d) listing cycles." However, the State still relies upon a substantially similar version of its 2014, "10 percent exceedance method with 90% statistical confidence" rather than EPA's suggested one in three exceedance assessment method. The State's 2016 assessment method does add the language, "[w]here applicable, biological rating is also considered for assessment of metals." Yet, it is unclear whether this addition saves DWR's assessment methodology and delisting proposal from close scrutiny, as the State's 2016 303(d) Listing Methodology provides no defense for why the > 10% exceedance is preferable to EPA's >one-exceedance-in-3 years method.

III. Trend of Neglecting Copper Impairments:

Many of the waterbodies at issue have been on the State's 303(d) list since 2010 or earlier. While "typically a TMDL is developed for each waterbody/pollutant combination," the State has only ever created one TMDL for copper. Such little effort by the State to address copper impairments is curious, given that EPA ranks metals as North Carolina's third largest 'cause of impairment group' at 114 of 1,323 and there are more copper impairments reported (84) than all of the other metals combined. In light of the evidence outlined above, DWR seems to demonstrate a trend of repeatedly delisting copper impaired waterbodies identified by EPA as necessary additions to the State's section 303(d) list. Moreover, DWR has repeatedly declined to either accept EPA's >one-exceedance-in-3 years method or provide evidence that demonstrates the State's > 10% exceedance is preferable with respect to assessing toxics.

IV. EPA Guidance on Delisting:

EPA issued a guidance document in 2003, Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act, that specifically responds

to a situation where a State proposes to delist previously listed segments. Specifically, the guidance document posits the question: "[c]an previously listed segments (without new data or information) be delisted solely because they have not yet been assessed with a new methodology?" The guidance document provides the following response:

"EPA does not believe it would be appropriate to delist previously listed segments (without new data or information) solely because they have not yet been assessed with a new methodology. The State must provide, at the request of the Regional Administrator, good cause for not including a previously listed segment on its new 2004 Section 303(d) list. There are some situations where a previously listed segment may be delisted without relying on data and information collected after the date of the previous list. For example, if the State evaluates the pre-existing data and information using a methodology that EPA has determined to be technically reasonable, and the results of that evaluation provide a "good cause" basis for not including the segment on the 2004 list, the segment would no longer need to be included in Category 5. However, the delisting should only occur if it is determined by EPA that the new methodology is technically sound, consistent with the State's WQSs, and is deemed statistically reasonable."

In light of EPA's scope of analysis for proposed section 303(d) delisting provided above, coupled with DWR's history of delisting requests and assessment methodology, it seems as though EPA should conduct an independent assessment and request DWR provide evidence of how its > 10% exceedance method is preferable to EPA suggestions.

V. Proposed 2016 Copper Delistings in the Yadkin Watershed

NCDEQ's proposed 2016 delisting include the following 15 segments in the Yadkin Pee Dee River Watershed:

<u>Rocky River Subbasin</u>
Beaverdam Creek, 13-17-4011-11 From source to Lanes Creek
Irish Buffalo Creek 13-17-9-(2) From Kannapolis Water Supply Dam to Rocky River
Mallard Creek 13-17-5a source to mouth
Richardson Creek 13-17-36-(5)a2 From Watson Creek to Salem Creek
Rocky River 13-17d From the Lanes Creek to the Pee Dee River
Rocky River 13-17c3 From Anderson Creek to Lanes Creek Rocky River 13-17c2 From Hamby Branch to Anderson Creek
Rocky River 13-17c3 From Anderson Creek to Lanes Creek

<u>South Yadkin Subbasin:</u>
Bear Creek 12-108-18-(3) From a point 0.2 miles downstream of U.S. Highway 64 to South Yadkin River

<u>Yadkin River Subbasin</u>
Yadkin River, (12-108.5)b1 From the mouth of Grants Creek to Buck Steam Station
Muddy Creek, 12-94-(0.5)b2b From Silas Creek to State Road 2995
Salem Creek (Middle For Muddy Creek) 12-94-12-4(b) From Burke Creek to State Road 1120
Salem Creek(Middle Fork Muddy Creek) 12-94-12-(4)c From State Road 1120 to Muddy Creek
Yadkin River, 12-(38)b from Reddies River to Mulberry Creek

The justification for each delisting was the same:

"Previous listing in Category 5 was inconsistent with the assessment methodology. Available data insufficient to determine attainment status"

As demonstrated above, the assessment methodology provided for all copper delistings in the Yadkin watershed does not satisfy previous methodological concerns voiced by EPA during the 2014 listing process. None of the copper delistings in the Yadkin watershed were based on the assessment or interpretation of more recent or more accurate data concerning the parameter of interest. That is, we have no evidence that the levels of copper in any of these waterbodies has declined below levels which EPA previously deemed sufficient to warrant 303(d) listing.

Instead of attempting to lessen the metals concentrations in these waters, DEQ continues to prosecute a methodological argument rejected in the previous 303(d) listing cycle. To allow such delisting without data would be a disservice to our members who fish, swim and paddle these waters.

DWR Response: *DWR followed the Environmental Management Commission (EMC) approved methodology for metals assessment. In the 2016 303(d) submittal package to EPA, DWR has provided a document "Water Quality Assessment Methods for Toxics" which raises concerns with using the >1 in 3 method for metals assessments.*

DWR will be going to the EMC to seek approval to put the 2018 Listing and Assessment Methodology out for public comment and will encourage feedback and suggestions for listing and assessment methods for the newly revised metals water quality standards.

Comment Source: US Environmental Protection Agency

The EPA Region 4 has reviewed North Carolina's 2016 Clean Water Act draft Section 303(d) list, proposed by the Division of Water Resources for public review and comment on February 26, 2016. As stated in correspondence related to previous 303(d) lists and review of the State's 2016 303(d) Listing Methodology, the EPA continues to have significant concerns about the State's listing process. The State has not provided adequate documentation to support some of its listing and delisting decisions, notably on these key issues:

- For assessments made based on a binomial distribution method, the procedure for delisting requires stronger evidence and a larger sample size than for listing, if the same level of confidence is required. By using the same procedure for delisting as listing, the State has selected a lower confidence level for delisting decisions. The rationale for this should be transparent, scientifically defensible, and presented in the Listing Methodology.

DWR Response: *DWR will be going to the EMC to seek approval to put the 2018 Listing and Assessment Methodology out for public comment and will encourage feedback and suggestions for listing and assessment methods. DWR will encourage comments from the public stakeholders with a goal to specifically define the delisting process in the 2018 Assessment Methodology. The delisting methodology is now built into the decision tool in WRAPS as "Reason for Rating". DWR assigned a reason for rating for all assessments and has provided the reasons and definitions for each reason for rating to EPA. The definition includes whether the assessment is Meeting Criteria, Exceeding Criteria or Data are Inconclusive.*

- For toxics criteria assessment in ambient water, the State must provide a scientifically defensible rationale to demonstrate that a ten percent exceedance frequency properly implements the water quality criteria.

DWR Response*: DWR followed the EMC approved methodology for metals assessment. In the 2016 303(d) submittal package to EPA, DWR has provided a document "Water Quality Assessment Methods for Toxics" which raises concerns with using the >1 in 3 method for metals assessments*

DWR will be going to the EMC to seek approval to put the 2018 Listing and Assessment Methodology out for public comment and will encourage feedback and suggestions for listing and assessment methods for the newly revised metals water quality standards from the public stakeholders.

We are enclosing previous correspondence where we identified these issues in detail and, for your convenience, have highlighted pertinent sections. Please note that if the above concerns are not adequately addressed and we must conduct independent assessments, action on the State's 303(d) list may be delayed. If you have questions, please contact me at (404) 562-9119 or Ms. Marion Hopkins of my staff at (404) 562-9481.

1) EPA Region 4 Comments on the North Carolina 2016 303(d) Assessment Methodology; email dated September 30, 2014.
2) EPA Region 4 Final decision to add fifty-one waterbody-pollutant combinations to North Carolina Final 2014 Section 303(d) list; letter dated December 19, 2014.

3) EPA Region 4 Letter initiating the process for submittal/approval of the 2016 303(d) list; letter dated September 28, 2015.