SOUTHERN ENVIRONMENTAL LAW CENTER

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January 16, 2019

Via First Class U.S. and Electronic Mail

Linda Culpepper, Director
Division of Water Resources
North Carolina Department of Environmental Quality
1611 Mail Service Center
Raleigh, North Carolina 27699-1612
Linda.Culpepper@ncdenr.gov

Re: Petition for Rulemaking to Repeal 15A NCAC 02B .0311(t) – the reclassification of the lower Cape Fear River – to remove the supplemental swamp waters (Sw) classification.

Dear Ms. Culpepper:

On behalf of its clients Cape Fear River Watch and Waterkeeper Alliance, the Southern Environmental Law Center petitions the Environmental Management Commission to remove the supplemental swamp waters classification from the lower Cape Fear River.

I have enclosed with this letter a Petition for Rulemaking and supporting materials. Please contact me with any questions or additional information needed to process this request. Thank you for your consideration.

Respectfully submitted,

Brooks Rainey Pearson

cc:
Lois Thomas
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BEFORE THE
NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Cape Fear River Watch and	)	PETITION FOR RULEMAKING
Waterkeeper Alliance,	)	PURSUANT TO NCGS § 150B-20
	)	AND 15A NCAC 02I .0501
Petitioners	)	TO REPEAL 15A NCAC 02B .0311(t)

On behalf of Cape Fear River Watch and Waterkeeper Alliance ("Petitioners"), the undersigned file this Petition for Rulemaking ("Petition") pursuant to and in accordance with the North Carolina Administrative Procedure Act, NCGS § 150B-20, and 15A NCAC 02I .0501. These provisions require any person wishing to adopt, amend, or repeal a rule of the North Carolina Environmental Management Commission ("EMC" or "the Commission") to submit a rulemaking petition addressed to the Director of the appropriate division of the Department of Environmental Quality ("DEQ"). The amended rules would remove the supplemental swamp waters (Sw) classification of portions of the lower Cape Fear River and return those waters to Class SC.

Cape Fear River Watch is a nonprofit organization with a mission to protect and improve the water quality of the lower Cape Fear River Basin through education, advocacy and action. Cape Fear River Watch houses the sole Riverkeeper for the entire lower Cape Fear River and advocates on behalf of the river basin at the local, state, and national levels.

Waterkeeper Alliance is a nonprofit corporation organized under the laws of the State of New York and is a charitable corporation under section 501(c)(3) of the Internal Revenue Code. Waterkeeper Alliance's mission is to strengthen and grow a global network of grassroots leaders protecting everyone's right to clean water. Waterkeeper Alliance currently connects 338 Waterkeeper organizations and affiliates organizations in 40 countries on 6 continents. In North Carolina, there are currently 14 Waterkeeper organizations and affiliates with members who live, work, recreate on, and obtain their drinking water from waterways and in watersheds in North Carolina, including the lower Cape Fear River.

Pursuant to 15 NCAC 02I .0501 this Petition is addressed to the Director of the Division of Water

Quality, which is the appropriate division of the Department of Environmental Quality. In addition, a copy will be sent to the Recording Clerk of the Commission. The following sections of this Petition shall be organized by and shall provide the information that is required of rulemaking petitions set forth in 15A NCAC 02I .0501(b)(1)-(5).

I. TEXT OF THE PROPOSED RULE

Petitioners request that 15A NCAC 02B .0311(t) be repealed in its entirety, returning the portion of the Cape Fear River Basin described therein to a Class SC by removing the supplemental swamp waters designation. The full text of the rule as proposed to be amended is attached as Exhibit A.

II. STATEMENT OF THE REASONS FOR THE REPEAL OF AN EXISTING RULE

For nearly two decades, the lower Cape Fear River—a fifteen-mile stretch of tidal salt water extending southward "from the mouth of Toomers Creek[,]" near Wilmington, N.C. "to a line across the river between Lilliput Creek and Snows Cut"[1]—has been on North Carolina's list of impaired waters.[2] As tidal salt waters, this segment of the river was originally assigned Class SC to ensure it would be "protected for secondary recreation, fishing, aquatic life including propagation and survival, and wildlife."[3]

At the time of its original listing, in 1998, the waterway was primarily burdened by low levels of dissolved oxygen—a threat to many of the species that rely on the estuary's brackish waters.[4] Since the

[1] NC DENR, Report of Proceedings on the Proposed Reclassification of a Cape Fear River Segment, in Brunswick and New Hanover Counties (Broad River Basin) From SC to SC Sw with a Water Quality Management Plan ("Report of the Proceedings")(Feb. 5, 2015), http://portal.ncdenr.org/c/document_library/get_file?uuid=866ee647-ef8a-4912-8d36- 06f26e6b1356&groupId=61581.

[2] N.C. Dep't of Env't and Natural Res. (NC DENR), North Carolina's 1998 303(d) List T-6 (May 15, 1998), http://portal.ncdenr.org/c/document_library/get_file?uuid=2284d944-2134-4c57-a2d9-499c58076d4a&groupId=38364. *See also* 33 U.S.C. § 1313(d)(1)(A) (obligating the State to identify, every two years, the waters within its boundaries for which existing pollution control requirements—including but not limited to effluent limitations—are not stringent enough to implement water quality standards).

[3] 15A NCAC 02B .0101(d)(1); see also 15A NCAC 02B .0220(2)(stating Class SC waters "shall be suitable for aquatic life propagation and maintenance of biological integrity, wildlife, and secondary recreation. Any source of water pollution that precludes any of these uses, including their functioning as [Primary Nursery Areas], on either a short-term or a long-term basis shall be considered to be violating a water quality standard.").

[4] Id. at T-6 (noting that 5,000 of the river's 7,500 acres were impaired as a result of low dissolved-oxygen levels—and that 5,561 of the river's acres were burdened with nonpoint pollution, including "ag" and "urban runoff"); see also, e.g., Report of Proceedings at a-102–a-103 (U.S. Fish and Wildlife Service comments on proposed

time of its original listing, the river has acquired additional problems—copper, nickel, and acidity, among them.[5]

Under the Clean Water Act ("CWA"), the lower Cape Fear River's appearance on North Carolina's list of impaired waters required the preparation of a total maximum daily load ("TMDL") identifying the pollution reductions "necessary to attain and maintain the applicable narrative and numerical" water-quality standards.[6] Within two years of the estuary's 1998 listing under North Carolina's dissolved-oxygen standard, agency officials and regulated dischargers were having regular meetings to discuss modeling and funding for a TMDL addressing low dissolved oxygen in the lower Cape Fear River. Work on the TMDL reportedly continued for more than a decade, with little apparent progress.[7] Upon information and belief, over the course of this decade, the agency made no attempt to evaluate the contributions to this impairment stemming from industrial animal agriculture operations upstream.[8]

On March 5, 2014, the lower Cape Fear River Program (the "Program") wrote North Carolina's Division of Water Resources with a possible solution—that the "portions of the lower Cape Fear River Estuary … that are currently classified as Class SC Waters be reclassified to include the supplemental Swamp (Sw) classification."[9] According to the Program, a "swamp" designation "would recognize the influence of natural drainage from riverine wetland and salt marsh systems that are ubiquitous throughout the lower Cape Fear River, Northeast Cape Fear River and Black River watersheds on water quality

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reclassification rule) (noting impacts of reduced dissolved-oxygen concentrations on fish species of management concern).

[5] See, e.g., NC DENR, 2008 North Carolina Integrated Report Categories 4 and 5 (Impaired Waters List) (March 10, 2010), http://portal.ncdenr.org/c/document_library/get_file?uuid=9f453bf9-2053-4329-b943-6614bd4e709a&groupId=38364.

[6] 40 C.F.R. § 130.7(c)(1); see also 33 U.S.C. § 1313(d)(1)(C).

[7] See, e.g., Report of Proceedings at a-96 (lower Cape Fear River Program comment letter) (asserting that the Program and the Department of Environmental Quality "worked towards development of a TMDL from about 2000 through 2010").

[8] This is particularly remarkable given that the lower Cape Fear River watershed features the highest concentration of swine production in the country and, still, poultry operations in the watershed produced twice as much plant available nitrogen and three times as much phosphorus. Heather Patt, DWR Basinwide Planning, A Comparison of PAN and P_20_5 produced from Poultry, Swine and Cattle Operations in North Carolina (2017).

[9] Report of Proceedings at a-2.

conditions in the river."[10] It would shift the blame, in other words, from the basin's historical polluters, some of whose impacts the agency never meaningfully evaluated, to the river's alleged "natural conditions."[11]

Despite significant problems with the Program's petition—for instance, the relevant segment of the river does not have the "low velocities" required under the Commission's own definitions of "swamp waters" in 15A NCAC 2B.0101(e)(2), 2B.0202(62), and 2B.0301(c)—DEQ decided to move forward with the reclassification, and the Commission approved the proposed reclassification of the lower Cape Fear River in September 2015.[12] In doing so, the Commission ignored the input of environmentalists,[13] academics,[14] and multiple agencies of federal government including the U.S. Environmental Protection Agency ("EPA") [15] and Fish & Wildlife Service.[16]

After the reclassification, on August 17, 2017, the National Marine Fisheries Service issued a final rule designating critical habitat the endangered Atlantic sturgeon.[17] The designation includes all of the section of the Cape Fear River that is the subject of this petition, and confirms the importance of sustaining "oxygen values that support" sturgeon – values that are substantially higher than those currently found in the lower Cape Fear River.[18]

More than two-and-a-half years after the reclassification—on April 9, 2018—DEQ submitted the reclassification rule to the EPA for approval pursuant to 40 CFR § 131.21.[19] In a July 24, 2018 letter EPA disapproved the swamp waters classification "because the documentation provided does not meet

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[10] Id.
[11] See 15A NCAC 02B .0220(5) ("natural conditions" standard for dissolved oxygen in tidal swamp waters).
[12] See 30:12 N.C. Register 1279 (Dec. 15, 2015).
[13] See Exhibit B
[14] See Exhibit C
[15] Report of Proceedings at 116 (EPA noted the reference to low velocity in the North Carolina definition of swamp waters and wrote "the State should provide additional documentation indicating the velocities and other characteristics that make the swamp classification appropriate for the lower Cape Fear River." EPA also expressed other technical concerns, such as the failure to consider anthropogenic causation of instream conditions and need for documentation explaining how the state would preserve water quality standards necessary to protect local endangered aquatic species.)
[16] Report of Proceedings at 118.
[17] 82 Fed. Reg. 39,160 (Aug. 17, 2017) (designating critical habitat for the endangered Carolina distinct population segment of Atlantic sturgeon).
[18] See id. at 240, 258.
[19] DEQ's letter to EPA is attached as Exhibit D.

the State's existing definition of swamp waters and does not address the technical concerns" of the agency.[20] Specifically, EPA found that DEQ did not provide documentation that (a) the designated uses of the lower Cape Fear would be protected with the swamp waters classification; or (b) the waters in the reclassified segment had low velocities that, per state rule, are part of the definition of swamp waters.

In accordance with 40 CFR §131.21(c), revised water quality standards are not effective under the CWA unless and until approved by EPA. Despite this, the disapproved supplemental swamp waters classification remains in North Carolina's Administrative Code, much to the dismay of citizens, local representatives, and state representatives along the lower Cape Fear who do not like the perception that their river is a "swamp" and who are concerned that such a misrepresentation of the river could threaten tourism in the area and recreational use of the river.[21] It is incumbent upon this Commission to repeal 15A NCAC 02B .0311(t) in order to accurately reflect the classification of the lower Cape Fear River approved by the EPA and to ensure that the language in the North Carolina Administrative Code matches the requirements of federal law.

Upon information and belief no discharge permit applications have been processed in reliance on the Class SC-Sw classification. However, it is indisputable that applying the rule as currently codified would be impermissible. Indeed, the Memorandum of Agreement ("MOU") between North Carolina and EPA that allows the state to administer the NPDES program, provides "No effluent limitations based on a variance or other change to water quality standards may be included in an NPDES permit unless the variance or other change to standards has been approved by EPA,"[22] and in its letter rejecting the reclassification, EPA instructed North Carolina to "continue to utilize the criteria associated with the Class SC designated use for all CWA purposes." Therefore the requested rulemaking would match North Carolina's regulations to the reality on the ground, and would not impact any NPDES permit holders.[23]

[20] EPA's letter to DEQ is attached as Exhibit E.
[21] See Exhibit F.
[22] See Exhibit G at 115.
[23] Petitioners are aware that, when assigning the swamp waters classification, the EMC also adopted a water quality management plan for the reclassified segment of the Cape Fear. *See* 15A NCAC 02B .0227(b)(2). Petitioners do not propose to repeal this management plan, though they lament its exclusive focus on new and expanding dischargers.

The requested repeal will not only benefit North Carolinians by clarifying applicable water quality standards; it will also make clear to the public and regulated community that DWR continues to have a legal obligation to restore water quality to meet the Class SC water quality standards for DO and pH. Although DO and pH may be lower in "swamp waters" when due to natural conditions, absent the supplemental classification, the default water quality standards for DO and pH in Class SC waters will apply.[24] Once the appropriate classification is codified, restoring adequate water quality standards, petitioners look forward to working with the agency to discuss ways to curb pollution and attain the water quality standards necessary to protect the designated uses of the segment.

III. STATEMENT OF THE EFFECT ON EXISTING RULES OR ORDERS

The proposed rulemaking will repeal the following sections of 15A of the North Carolina Administrative Code: 02B .0311(t). The proposed repeal will not affect any other existing rules. Nor will the proposed repeal affect any orders by the Commission.

IV. THE NAME AND ADDRESS OF PETITIONERS

Cape Fear River Watch
617 Surry St.
Wilmington, NC 28401

Waterkeeper Alliance
976 Martin Luther King Jr. Blvd., Suite P
Chapel Hill, NC 27514.

After all, where waters provide habitat for federally-listed endangered aquatic species, DWR "shall develop site-specific management strategies under the provisions of 15A NCAC 2B .0225 or 15A NCAC 2B .0227." 15A NCAC 2B .0110. The lower Cape Fear provides designated critical habitat for endangered sturgeon. Classification as Outstanding Resource Waters under 15A NCAC 2B .0225 requires "that the water quality is rated as excellent based on physical, chemical, or biological information" so, in light of the longstanding impairment of the lower Cape Fear, the agency is obligated to develop a site-specific management strategy under 15A NCAC 2B .0227.

[24] To be clear, if the low DO and pH in the lower Cape Fear River were actually due to natural conditions, this would not be considered a violation of water quality standards. *See* 15A NCAC 02B .0205 ("Water quality standards will not be considered violated when values outside the normal range are caused by natural conditions."). However, DWR has never conducted a "natural conditions" assessment of this segment.

V. REQUEST TO PRESENT THIS PETITION TO THE COMMITTEE

Pursuant to 15A NCAC 02I .0502(d), Petitioners request the opportunity to present this petition for rulemaking to the Water Quality Committee or other appropriate committee of the Environmental Management Committee.

Respectfully submitted this the 16th day of January, 2019.

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Chapel Hill, NC 27516
bpearson@selcnc.org
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Counsel for
Cape Fear River Watch
Waterkeeper Alliance

Exhibit A

15A NCAC 02B .0311 CAPE FEAR RIVER BASIN

(a) Effective February 1, 1976, the adopted classifications assigned to the waters within the Cape Fear River Basin are set forth in the Cape Fear River Basin Schedule of Classifications and Water Quality Standards, which may be inspected at the following places:
   (1) the Internet at http://portal.ncdenr.org/web/wq/ps/csu/rules; and
   (2) the North Carolina Department of Environment and Natural Resources:
      (A) Winston-Salem Regional Office
      585 Waughtown Street
      Winston-Salem, North Carolina
      (B) Fayetteville Regional Office
      225 Green Street
      Systel Building Suite 714
      Fayetteville, North Carolina
      (C) Raleigh Regional Office
      3800 Barrett Drive
      Raleigh, North Carolina
      (D) Washington Regional Office
      943 Washington Square Mall
      Washington, North Carolina
      (E) Wilmington Regional Office
      127 Cardinal Drive Extension
      Wilmington, North Carolina
      (F) Division of Water Quality
      Central Office
      512 North Salisbury Street
      Raleigh, North Carolina.

(b) The Cape Fear River Basin Schedule of Classification and Water Quality Standards was amended effective:
   (1) March 1, 1977;
   (2) December 13, 1979;
   (3) December 14, 1980;
   (4) August 9, 1981;
   (5) April 1, 1982;
   (6) December 1, 1983;
   (7) January 1, 1985;
   (8) August 1, 1985;
   (9) December 1, 1985;
   (10) February 1, 1986;
   (11) July 1, 1987;
   (12) October 1, 1987;
   (13) March 1, 1988;
   (14) August 1, 1990.

(c) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective June 1, 1988 as follows:
   (1) Cane Creek [Index No. 16-21-(1)] from source to a point 0.5 mile north of N.C. Hwy. 54 (Cane Reservoir Dam) including the Cane Creek Reservoir and all tributaries has been reclassified from Class WS-III to WS-I.
   (2) Morgan Creek [Index No. 16-41-1-(1)] to the University Lake dam including University Lake and all tributaries has been reclassified from Class WS-III to WS-I.

(d) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective July 1, 1988 by the reclassification of Crane Creek (Crains Creek) [Index No. 18-23-16-(1)] from source to mouth of Beaver Creek including all tributaries from C to WS-III.

(e) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective January 1, 1990 as follows:

(1) Intracoastal Waterway (Index No. 18-87) from southern edge of White Oak River Basin to western end of Permuda Island (a line from Morris Landing to Atlantic Ocean), from the eastern mouth of Old Topsail Creek to the southwestern shore of Howe Creek and from the southwest mouth of Shinn Creek to channel marker No. 153 including all tributaries except the King Creek Restricted Area, Hardison Creek, Old Topsail Creek, Mill Creek, Futch Creek and Pages Creek were reclassified from Class SA to Class SA ORW.

(2) Topsail Sound and Middle Sound ORW Area which includes all waters between the Barrier Islands and the Intracoastal Waterway located between a line running from the western most shore of Mason Inlet to the southwestern shore of Howe Creek and a line running from the western shore of New Topsail Inlet to the eastern mouth of Old Topsail Creek was reclassified from Class SA to Class SA ORW.

(3) Masonboro Sound ORW Area which includes all waters between the Barrier Islands and the mainland from a line running from the southwest mouth of Shinn Creek at the Intracoastal Waterway to the southern shore of Masonboro Inlet and a line running from the Intracoastal Waterway Channel marker No. 153 to the southside of the Carolina Beach Inlet was reclassified from Class SA to Class SA ORW.

(f) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective January 1, 1990 as follows: Big Alamance Creek [Index No. 16-19-(1)] from source to Lake Mackintosh Dam including all tributaries has been reclassified from Class WS-III NSW to Class WS-II NSW.

(g) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective August 3, 1992 with the reclassification of all water supply waters (waters with a primary classification of WS-I, WS-II or WS-III). These waters were reclassified to WS-I, WS-II, WS-III, WS-IV or WS-V as defined in the revised water supply protection rules, (15A NCAC 02B .0100, .0200 and .0300) which became effective on August 3, 1992. In some cases, streams with primary classifications other than WS were reclassified to a WS classification due to their proximity and linkage to water supply waters. In other cases, waters were reclassified from a WS classification to an alternate appropriate primary classification after being identified as downstream of a water supply intake or identified as not being used for water supply purposes.

(h) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective June 1, 1994 as follows:

(1) The Black River from its source to the Cape Fear River [Index Nos. 18-68-(0.5), 18-68-(3.5) and 18-65-(11.5)] was reclassified from Classes C Sw and C Sw HQW to Class C Sw ORW.

(2) The South River from Big Swamp to the Black River [Index Nos. 18-68-12-(0.5) and 18-68-12(11.5)] was reclassified from Classes C Sw and C Sw HQW to Class C Sw ORW.

(3) Six Runs Creek from Quewhiffle Swamp to the Black River [Index No. 18-68-2] was reclassified from Class C Sw to Class C Sw ORW.

(i) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective September 1, 1994 with the reclassification of the Deep River [Index No. 17-(36.5)] from the Town of Gulf-Goldston water supply intake to US highway 421 including associated tributaries from Class C to Classes C, WS-IV and WS-IV CA.

(j) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective August 1, 1998 with the revision to the primary classification for portions of the Deep River [Index No. 17-(28.5)] from Class WS-IV to Class WS-V, Deep River [Index No. 17-(41.5)] from Class WS-IV to Class C, and the Cape Fear River [Index 18-(10.5)] from Class WS-IV to Class WS-V.

(k) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective April 1, 1999 with the reclassification of Buckhorn Creek (Harris Lake)[Index No. 18-7-(3)] from the backwaters of Harris Lake to the Dam at Harris Lake from Class C to Class WS-V.

(l) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective April 1, 1999 with the reclassification of the Deep River [Index No. 17-(4)] from the dam at Oakdale-Cotton Mills, Inc. to the dam at Randleman Reservoir (located 1.6 mile upstream of U.S. Hwy 220 Business), and including tributaries from Class C and Class B to Class WS-IV and Class WS-IV & B. Streams within the Randleman Reservoir Critical Area have been reclassified to WS-IV CA. The Critical Area for a WS-IV reservoir is defined as 0.5 mile and draining to the normal pool elevation of the reservoir. All waters within the Randleman Reservoir Water Supply Watershed are within a designated Critical Water Supply Watershed and are subject to a special management strategy specified in 15A NCAC 02B .0248.

(m) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective August 1, 2002 as follows:
    (1) Mill Creek [Index Nos. 18-23-11-(1), 18-23-11-(2), 18-23-11-3, 18-23-11-(5)] from its source to the Little River, including all tributaries was reclassified from Class WS-III NSW and Class WS-III B NSW to Class WS-III NSW HQW@ and Class WS-III B NSW HQW@.
    (2) McDeed's Creek [Index Nos. 18-23-11-4, 18-23-11-4-1] from its source to Mill Creek, including all tributaries was reclassified from Class WS III NSW and Class WS-III B NSW to Class WS-III NSW HQW@ and Class WS-III B NSW HQW@.

The "@" symbol as used in this Paragraph means that if the governing municipality has deemed that a development is covered under a "5/70 provision" as described in Rule 15A NCAC 02B .0215(3)(b)(i)(E) (Fresh Surface Water Quality Standards for Class WS-III Waters), then that development is not subject to the stormwater requirements as described in rule 15A NCAC 02H .1006 (Stormwater Requirements: High Quality Waters).

(n) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective November 1, 2004 as follows:
    (1) the portion of Rocky River [Index Number 17-43-(1)] from a point 0.3 mile upstream of Town of Siler City upper reservoir dam to a point 0.3 mile downstream of Lacy Creek from WS-III to WS-III CA.
    (2) the portion of Rocky River [Index Number 17-43-(8)] from dam at lower water supply reservoir for Town of Siler City to a point 65 feet below dam (site of proposed dam) from C to WS-III CA.
    (3) the portion of Mud Lick Creek (Index No. 17-43-6) from a point 0.4 mile upstream of Chatham County SR 1355 to Town of Siler City lower water supply reservoir from WS-III to WS-III CA.
    (4) the portion of Lacy Creek (17-43-7) from a point 0.6 mile downstream of Chatham County SR 1362 to Town of Siler City lower water supply reservoir from WS-III to WS-III CA.

(o) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective November 1, 2007 with the reclassifications listed below, and the North Carolina Division of Water Quality maintains a Geographic Information Systems data layer of these UWLs.
    (1) Military Ocean Terminal Sunny Point Pools, all on the eastern shore of the Cape Fear River [Index No. 18-(71)] were reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.
    (2) Salters Lake Bay near Salters Lake [Index No. 18-44-4] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.
    (3) Jones Lake Bay near Jones Lake [Index No. 18-46-7-1] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.
    (4) Weymouth Woods Sandhill Seep near Mill Creek [18-23-11-(1)] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.
    (5) Fly Trap Savanna near Cape Fear River [Index No. 18-(71)] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.
    (6) Lily Pond near Cape Fear River [Index No. 18-(71)] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.
    (7) Grassy Pond near Cape Fear River [Index No. 18-(71)] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.
    (8) The Neck Savanna near Sandy Run Swamp [Index No. 18-74-33-2] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.
    (9) Bower's Bog near Mill Creek [Index No. 18-23-11-(1)] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.
    (10) Bushy Lake near Turnbull Creek [Index No. 18-46] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.

(p) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective January 1, 2009 as follows:
    (1) the portion of Cape Fear River [Index No. 18-(26)] (including tributaries) from Smithfield Packing Company's intake, located approximately 2 miles upstream of County Road 1316, to a point 0.5 miles upstream of Smithfield Packing Company's intake from Class C to Class WS-IV CA.
    (2) the portion of Cape Fear River [Index No.18-(26)] (including tributaries) from a point 0.5 miles upstream of Smithfield Packing Company's intake to a point 1 mile upstream of Grays Creek from Class C to Class WS-IV.

(q) The schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective August 11, 2009 with the reclassification of all Class C NSW waters and all Class B NSW waters upstream of the dam at B. Everett Jordan Reservoir from Class C NSW and Class B NSW to Class WS-V NSW and Class WS-V & B NSW, respectively. All waters within the B. Everett Jordan Reservoir Watershed are within a designated Critical Water Supply Watershed and are subject to a special management strategy specified in 15A NCAC 02B .0262 through .0273.

(r) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective September 1, 2009 with the reclassification of a portion of the Haw River [Index No. 16-(28.5)] from the Town of Pittsboro water supply intake, which is located approximately 0.15 mile west of U.S. 15/501, to a point 0.5 mile upstream of the Town of Pittsboro water supply intake from Class WS-IV to Class WS-IV CA.

(s) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective March 1, 2012 with the reclassification of the portion of the Haw River [Index No. 16-(1)] from the City of Greensboro's intake, located approximately 650 feet upstream of Guilford County 2712, to a point 0.5 miles upstream of the intake from Class WS-V NSW to Class WS-IV CA NSW, and the portion of the Haw River [Index No. 16-(1)] from a point 0.5 miles upstream of the intake to a point 0.6 miles downstream of U.S. Route 29 from Class WS-V NSW to Class WS-IV NSW.

~~(t) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective June 30, 2017 with the reclassification of a section of 18-(71) from upstream mouth of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut from Class SC to Class SC Sw. A site-specific management strategy is outlined in 15A NCAC 02B .0227.~~

History Note: *Authority G.S. 143-214.1; 143-215.1; 143-215.3(a)(1);*
Eff. February 1, 1976;
Amended Eff. June 30, 2017; March 1, 2012; September 1, 2009; August 11, 2009; January 1, 2009; November 1, 2007; November 1, 2004; August 1, 2002; April 1, 1999; August 1, 1998; September 1, 1994; June 1, 1994; August 3, 1992; August 1, 1990.

Exhibit B

SOUTHERN ENVIRONMENTAL LAW CENTER

Telephone 919-967-1450 | 601 WEST ROSEMARY STREET, SUITE 220 CHAPEL HILL, NC 27516-2356 | Facsimile 919-929-9421

March 3, 2015

VIA ELECTRONIC MAIL
Elizabeth Kountis
DENR-DWR Planning Section
1611 Mail Service Center
Raleigh, NC 27699-1611
elizabeth.kountis@ncdenr.gov

Re: Proposed Cape Fear River swamp classification and management plan

Dear Ms. Kountis:

The Southern Environmental Law Center appreciates the opportunity to comment on the proposed classification and management plan on behalf of American Rivers, Cape Fear River Watch, and the North Carolina Conservation Network. Together, these organizations represent thousands of North Carolinians who drink, fish, swim, and paddle the state's rivers, including the Cape Fear; who place a high value on the quality of North Carolina's water resources; and who will be adversely affected by the degradation of water quality in the Cape Fear River.

The comments that follow explain and detail our objections to these proposals. Section I emphasizes changes in the goals of environmental protection that led the State to protect waters for use by aquatic life. Section II addresses the relationship between classifications that identify the uses for which waters must be protected and water quality standards designed to afford the desired protection. Section III focuses on the classification and standards applicable to swamp waters. The remaining sections state specific objections to the proposals under consideration, which we believe would ignore the best usage of the Cape Fear River and further impair use of this water body by aquatic life by, among other things, authorizing persistent lower dissolved pH and dissolved oxygen concentrations that would not be protective of species inhabiting the affected segment of the river.

I. Evolution of Protected Uses of North Carolina's Waters

The content of laws protecting North Carolina's waters has always been tied to the use for which our leaders sought to protect these natural resources. Between the colonial era and the 19th century, state and federal laws were enacted primarily to ensure use of water for drinking, navigation, and hydropower.[1] Although some 19th-century enactments designed to protect

[1] For instance, in 1899 Congress, primarily concerned with threats to the commercial use of interstate waterways, outlawed the "dumping of refuse that would obstruct navigation of navigable waters, except under a federal permit." River and Harbors Act of 1899, ch. 425, 30 Stat. 1121 (1899) (codified at 33 U.S.C. § 401-467). In North Carolina, the "first legislative acts concerning streams of the state were acts of the early colonial assembly to encourage

commerce or public health collaterally benefited aquatic life,[2] the primary legislative focus was on preserving the public's water supply source, and "[l]ittle or no protection was yet afforded other uses of surface waters."[3]

The enactment of pollution controls to protect drinking water continued into the 20th century.[4] Even laws reflecting consideration of the use of waters by aquatic life remained focused on protecting commerce or public health.[5] Between the Great Depression and World War II,[6] the focus on commerce and public health persisted, and relatively few advances in state water-pollution law occurred in that period.

After the war, federal and state governments returned their attention to controlling water pollution,[7] and the law increasingly recognized the need to protect water for reasons other than commerce and public health. In 1951, the North Carolina General Assembly enacted the State Stream Sanitation Act, observing that the "best interest of the people" was served when water resources were protected for a variety of uses, including use by aquatic life.[8] The Act created the State Stream Sanitation Committee (SSSC) and empowered it to "establish methods designed to protect the water requirement for health, recreation, fishing, agriculture, industry, and animal life."[9] This expanded approach to water pollution control was advanced by the federal Clean Water Act (CWA),[10] which sought to develop pollution-control programs to conserve water for

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navigation." David H. Howells, Quest for Clean Streams in North Carolina: An Historical Account of Stream Pollution Control in North Carolina, 258 Water Resources Res. Inst. of the Univ. of N.C. 3 (1990).

[2] *See, e.g.*, Public Laws and Resolutions, N.C. General Assembly 1883, ch. 290 (making it "unlawful for any person to put any poisonous substance or matter for the purpose of catching, killing, or driving of any fish in any of the waters of any creek or river within the state."); Public Laws and Resolutions, N.C. General Assembly 1889, ch. 52 (prohibiting sawmill owners from dumping sawdust "into any river, creek, or stream of water, whereby the channel may be obstructed or damage done to any oyster bed, or the health of any person may be impaired").

[3] Howells, *supra* n.1 at 7.

[4] *See, e.g.,* Public Laws and Resolutions, N.C. General Assembly 1903, ch. 159 (criminalizing the pollution of "any well, spring, drain, branch, brook or creek, or other source of public water supply used for drinking purposes."). Notably, the same law prohibited the discharge of raw sewage and spurred statewide advances in municipal sanitation. Howells, *supra* n.1 at 13.

[5] For instance, the Fisheries Commission Board was created in 1915 with the power to enforce new laws prohibiting the discharge of certain substances harmful to commercial fishing. Howells, *supra* n.1 at 17. Another law followed in 1927 prohibiting discharge of substances poisonous to fish in designated fish-producing waters, but "there were no prosecutions under either the 1915 or 1927 acts." *Id.* at 21-22 (noting that "the antipollution provision was never enforced by the board"). Later, in the 1920s, the State Board of Health began restricting shellfish areas where bacteriological contamination rendered harvested shellfish unsafe for human consumption. *Id.* at 18.

[6] By 1944, the State Board of Health claimed that stream sanitation was "becoming more critical each year." *Id.* at 41.

[7] The U.S. Congress enacted the Water Pollution Control Act of 1948 to provide technical and financial assistance to states for the creation of state water pollution control programs. Water Pollution Control Act, Pub. L. No. 80-845, 62 Stat. 1155 (1948).

[8] Session Laws and Resolutions, N.C. General Assembly 1951 ch. 606.

[9] *Id.*

[10] 33 U.S.C. § 1251(a). The Act sought to develop pollution control programs by giving "due regard" to the improvements necessary to conserve waters "for the protection and propagation of fish and aquatic life and wildlife, recreational purposes, and the withdrawal of such water for public water supply, agricultural, industrial, and other purposes." 33 U.S.C. § 1252(a).

various uses, including "the protection and propagation of fish and aquatic life and wildlife, recreational purposes, and the withdrawal of such water for public water supply, agricultural, industrial, and other purposes."[11]

Both federal and state leaders realized the need to categorize water resources by reference to the uses that they sought to protect by law. Accordingly, the North Carolina General Assembly required the SSSC to identify the "best usage" of the state's water resources, then to adopt associated water quality standards to protect those uses.[12] Regulations adopted to implement the CWA similarly required each state to "specify appropriate water uses to be achieved and protected" before adopting water quality standards.[13]

The early evolution of water pollution control in North Carolina serves as an important reminder that the use for which the law seeks to preserve our waters is the primary driver of the standards imposed on the regulated community. As explained below, one problem with the proposal to reclassify a portion of the Cape Fear River as a swamp is that it materially alters an important use for which the river is currently protected. In Section II, we examine the connection between use classifications and associated quality standards.

II. "Best Usage" and Classification of Water Bodies

Today, each state has a duty to adopt water quality standards under the CWA in order to protect public health or welfare, enhance the quality of water, and otherwise serve the purposes of the CWA.[14] As part of this first step in setting appropriately protective water quality standards, states must assign classifications to surface waters within their borders that identify the uses that each water body must support, and then set criteria necessary to protect the uses.

Accordingly, the uses for which the North Carolina Environmental Management Commission (EMC)[15] intends to protect North Carolina's waters are reflected in its assignment of water body classifications. The classification of a water body dictates the applicable water quality standards, which are in turn designed to protect the "best usage" of the waters with that classification.[16] The law requires the EMC to consider multiple factors before determining the classifications of waters. First, it must consider physical characteristics, including "the size, depth, surface area covered, volume, direction and rate of flow, stream gradient and temperature

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[11] *Id.* § 1252(a). North Carolina's water quality classifications must be consistent with the requirements of the CWA.
[12] Session Laws and Resolutions, N.C. General Assembly 1951 ch. 606.
[13] 40 C.F.R. § 131.10(a).
[14] 40 C.F.R. § 131.2.
[15] Many duties originally assigned to the State Stream Sanitation Committee, including those related to the classification of waters, were conferred on the Board of Water and Air Resources in 1967, 1967 N.C. Sess. Laws 1967-892 (1967), and then on the EMC in 1973, 1973 N.C. Sess. Laws 1973-1262 § 19 (1973).
[16] *See* N.C. Gen. Stat. 143-214.1(a)(1) (directing the EMC to develop "a series of classifications and the standards applicable to each such classification"); 15A N.C. Admin. Code 2B .0201 ("Existing uses . . . and the water quality to protect such uses shall be protected by properly classifying surface waters and having standards sufficient to protect these uses."); *see also* 40 C.F.R. § 131.11(a)(1) ("States must adopt those water quality criteria that protect the designated use. . . . For waters with multiple use designations, the criteria shall support the most sensitive use.")

of water."[17] It must also consider whether the "character of the district bordering said water" evinces suitability for, or established economic interest in, a particular use of the water.[18] Most importantly, the EMC must consider the uses that "have been made, are being made, or may in the future be made" of the water.[19] Ultimately, the EMC must adopt classifications and the associated standards "with primary reference to the best usage to be made of the waters to which such classification will be assigned."[20]

Pursuant to this statutory guidance, the EMC developed eight freshwater classifications, four saltwater classifications, and seven supplemental classifications for potential assignment to waters of the state.[21] Some classifications are based on the type of human use for which waters are protected.[22] Some classifications recognize that use of waters by aquatic life requires different protection in freshwater and saltwater.[23] Other classifications, particularly those designed to protect sources of drinking water, are based on the degree of development in the watershed.[24] And some of the primary classifications, like the two reserved for wetlands (Class WL for freshwater; Class SWL for saltwater) reference specific physical characteristics of the waters. The variety of available water body classifications demonstrates that the EMC realized that different uses require different protections. While these broad classifications are often sufficient to protect the best usage of waters, sometimes a more nuanced approach, involving the application of supplemental classifications, is required.

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[17] N.C. Gen. Stat. § 143-214.1.
[18] *Id.* § 143-214.1(d)(2).
[19] *Id.* § 143-214.1(d)(3) (requiring the EMC to consider "[t]he uses and extent thereof which have been made, are being made, or may in the future be made, of such water for domestic consumption, bathing, fish or wildlife and their culture, industrial consumption, transportation, fire prevention, power generation, scientific or research uses, the disposal of sewage, industrial wastes and other wastes, or any other uses"); *see also* 15A N.C. Admin. Code 2B .0101 (requiring consideration, in addition to the uses listed in G.S. 143-214.1(d), of "all existing uses" of the water body in question).
[20] N.C. Gen. Stat. § 143-214.1(b).
[21] 15A N.C. Admin. Code 2B .0101.
[22] For example, while waters in classes C, B, SC, and SB are all protected for "secondary recreation, fishing, aquatic life including propagation and survival, and wildlife," 15A N.C. Admin. Code 2B .0101(c)(1), (2); 15A N.C. Admin. Code 2B .0101(d)(1), (2), Class B and SB waters are also "protected for primary recreation." *Id.* 2B .0220(c)(1)-(2); *id.* 2B .0220(d)(1)-(2). "Primary recreation" contemplates uses "involving human body contact . . . on a frequent basis," *id.*2B .0202(52), while "secondary recreation" contemplates uses "involving human body contact with water . . . on an infrequent, unorganized, or incidental basis," *id.* 2B .0202(57).
[23] For fresh water, the default classification is Class C. 15A N.C. Admin. Code 2B .0211 ("The water quality standards for all fresh surface waters shall be the basic standards applicable to Class C waters. . . . Additional and more stringent standards applicable to other specific freshwater classifications are specified [elsewhere in] this Section."). For salt water, the default classification is Class SC. 15A N.C. Admin. Code 2B .0220 ("The water quality standards for all tidal salt waters shall be the basic standards applicable to Class SC waters. Additional and more stringent standards applicable to other specific tidal salt water classifications are specified in Rules .0221 and .0222 of this Section.").
[24] See 15A N.C. Admin. Code 2B .0101(c)(3)-(6) (listing different classifications for water supplies in "natural and undeveloped watersheds," "predominantly undeveloped watersheds," "low to moderately developed watersheds," "moderately to highly developed watersheds," and "moderately to highly developed watersheds").

Supplemental classifications are used to focus pollution control narrowly by enhancing protection in accordance with specific features of a water body. Many supplemental classifications are therefore based on the water body's physical, biological, or chemical characteristics. For instance, the "Nutrient Sensitive Waters" or "NSW" classification is reserved for "waters subject to growths of microscopic or macroscopic vegetation requiring limitations on nutrient inputs,"[25] and it requires development of strategies to control eutrophication "so that existing and designated uses of the water body are protected or restored."[26] Likewise, waters classified as trout waters (i.e., those that will "sustain and allow for trout propagation and survival of stocked trout on a year-round basis"[27]) are afforded additional protection against pollutants harmful to those fish.[28] Of particular relevance to the proposal under consideration, "waters which have low velocities and other natural characteristics which are different from adjacent streams" may be assigned a supplemental classification as "swamp waters."[29]

III. "Swamp Waters" Classification

The "swamp waters" classification is intended to protect the unique aquatic community adapted to natural conditions found in swamps. Accordingly, the water quality standards associated with the "swamp waters" classification are designed to protect the use of waters for aquatic life propagation and survival that naturally occur in swamp waters.[30] Specifically, the EMC allows certain swamp waters to have higher acidity (i.e., low pH) and lower dissolved oxygen (DO) concentrations.[31]

This is significant because the use of waters for the survival and propagation of aquatic life (i.e., aspects of the "best usage" of Class SC and Class C waters that are not also classified as swamp waters) usually requires *higher* pH and DO levels. Fish production is generally higher in more alkaline waters (i.e., those with high pH),[32] and low pH can limit development and survival

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[25] *Id.* 2B .0101(e)(3).
[26] 15A N.C. Admin. Code 2B .0223(e).
[27] 15A N.C. Admin. Code 2B .0202(65).
[28] *See, e.g.,* 15A N.C. Admin. Code 2B .0211 (stating different standards for chlorophyll-a, dissolved oxygen, cadmium, temperature, and turbidity for designated trout waters).
[29] *Id.* 2B .0101(e)(2).
[30] In contrast, other supplemental classifications result in application of more stringent water quality standards. *See, e.g.,* 15A N.C. Admin. Code 2B .0211(4) (more stringent freshwater chlorophyll-a standards for nutrient-sensitive waters and trout waters); *id.* 2B.011(6) (more stringent DO standards for trout waters); *id.* 2B .0211(19) (toluene standard applicable only to trout waters); *id.* 2B .0211(21) (more stringent turbidity standard for trout waters); *id.* 2B .0220(3) (more stringent saltwater chlorophyll-a standards for nutrient sensitive waters and trout waters); *id.* 2B .0223 (requiring development of nutrient control strategies in nutrient sensitive waters); *id.* 2B .0224 (stating standards applicable to high-quality waters); *id.* 2B .0225 (stating standards for outstanding resource waters). The State's antidegradation policy is also stricter for waters classified as high-quality waters or outstanding resource waters. *Id.* 2B .0201.
[31] 15A N.C. Admin. Code 2B .0211(6), (14) (permitting lower pH and DO standards for Class C waters with the supplemental "swamp waters" classification); 15A N.C. Admin. Code 2B .0220(5), (12) (permitting lower pH and DO standards for Class SC waters with the supplemental "swamp waters" classification).
[32] Louis A. Helfrich et al, *Liming Acidified Lakes and Ponds*, Virginia Cooperative Extension Pub. 420-254 (2009).

of shellfish by inhibiting shell development.[33] In addition, pH affects the solubility and biological availability of nutrients and heavy metals.[34] Low pH can therefore limit the nutrients available for plant growth and increase the toxicity of metals.

Similarly, DO is critical to the survival of fish and other aquatic life, and lower concentrations are typically detrimental.[35] The EMC recognized this fact when requiring higher DO concentrations in trout waters.[36] In waters with low levels of DO, finfish and mobile macroinvertebrates can experience negative impacts ranging from mortality to impaired reproduction, immune responses, and growth.[37] DO is also critical to the decomposition of organic matter in the water and bottom sediments.

In Class SC waters like the lower Cape Fear River, the normal dissolved oxygen standard is 5.0 mg/L.[38] But the law provides that "swamp waters . . . may have lower values if caused by natural conditions."[39] Similarly, while the pH in Class SC waters should be "normal for waters in the area, which range between 6.8 and 8.5,"[40] Class SC waters with the supplemental "swamp waters" classification "may have a pH as low as 4.3 if it is the result of natural conditions."[41] Indeed, the primary consequence of a supplemental designation as swamp waters is the lowering of pH and DO levels to ensure that the standards protect natural conditions.

Ultimately, the standards for pH and DO in swamp waters reflect the EMC's acknowledgment that certain aquatic species have adapted to conditions in relatively stagnant waters, where natural characteristics and processes have combined to alter the chemical composition of the aquatic environment.[42] However, lowering pH and DO where natural conditions have *not* prepared aquatic life for these stressors can have a negative impact on the usage of waters for the propagation and survival of aquatic life. This is why it is only acceptable

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[33] Saskia de Melker, *Coral Reefs and Shellfish Battle Acidifying Oceans*, PBS Newshour (Dec. 5, 2012) ("As acidity increases, animals like scallops, oysters, and clams have a harder time extracting the calcium carbonate they need to build their essential shells. Shells become thinner, growth slows down, and death rates rise."), *available at* http://www.pbs.org/newshour/updates/climate-change-july-dec12-acidification_12-05/

[34] US Geological Survey Water Science School, *ph – Water properties* (2014), available at http://water.usgs.gov/edu/ph.html.

[35] US EPA, Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras 4 (Nov. 2000) ("Oxygen is essential in aerobic organisms for the electron transport system of mitochondria. Oxygen insufficiency at the mitochondria results in reduction in cellular energy and a subsequent loss of ion balance in cellular and circulatory fluids."), *available at* http://water.epa.gov/scitech/swguidance/standards/upload/2007_03_01_criteria_dissolved_docriteria.pdf.

[36] 15A N.C. Admin. Code 2B .0220(6).

[37] Denise L. Brietburg et al, Hypoxia, Nitrogen, and Fisheries: Integrating Effects Across Local and Global Landscapes, 1 Annual Review of Marine Science 333-35 (2009), *available at* http://moritz.botany.ut.ee/~olli/eutrsem/Breitburg09.pdf.

[38] 15A N.C. Admin. Code 2B .0220(5).

[39] *Id.*

[40] 15A N.C. Admin. Code 2B 2B .0220(12).

[41] *Id.*

[42] US EPA, Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras 5 (Nov. 2000) ("Compensatory adaptations are well developed in marine animals that commonly experience hypoxia.").

for a water body designated as swamp waters to have lower pH and DO when "caused by" or the "result of" natural conditions.[43]

IV. The EMC Must Not Ignore the Defining Characteristics of Swamp Waters

The members of the Lower Cape Fear River Program (Petitioners), a collection of permitted wastewater dischargers, have asked the EMC to reclassify a segment of the Cape Fear River as swamp waters.[44] Although Petitioners argue that pH and DO levels in the Cape Fear River are the result of "natural conditions," they ignore the fact that the river lacks the natural *characteristics* that define swamp waters. The first problem with the proposal to reclassify this segment is that doing so would be directly contrary to the EMC's own definition of "swamp waters."

State regulations provide multiple definitions of "swamp waters," and in each the defining characteristic is low velocity.[45] Although Petitioners claim to support their reclassification request with "a wealth of research and technical assessment studies," data about velocity are conspicuously absent from their petition. The lack of velocity data is particularly notable given that Petitioners have a web of monitoring stations, including multiple stations in the affected segment; apparently none of the stations monitors or records velocity data.[46] Yet this is precisely the kind of "data and information required for determining" whether classification of the segment as "swamp waters" is appropriate.[47]

Given the dearth of data provided by Petitioners, it should be noted that data confirm that the Cape Fear River, in fact, has a high velocity. Studies by U.S. Army Corps of Engineers confirm that velocity in the lower Cape Fear River regularly exceeds 2 ft/s.[48] The National

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[43] 15A N.C. Admin. Code 2B .0211(6), (14); 15A N.C. Admin. Code 2B .0220(5), (12).

[44] Specifically, Petitioners seek reclassification of a portion of the river consisting of section 19-(71) from upstream of the mouth of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut.

[45] 15A N.C. Admin. Code 02B .0101(e)(2) ("Swamp waters (Sw): waters which have low velocities and other natural characteristics which are different from adjacent streams"); 15A N.C. Admin. Code 02B .0202(62) ("Swamp waters mean those waters which are classified by the Environmental Management Commission and which are topographically located so as to generally have very low velocities and other characteristics which are different from adjacent streams draining steeper topography."); 15A N.C. Admin. Code 02B .0301(c) (defining swamp waters as "Waters which have low velocities and other natural characteristics which are different from adjacent streams").

[46] To its credit, the coalition has collected a wealth of data about other parameters, including temperature, pH, dissolved oxygen, conductivity, fecal coliform, enterococcus, turbidity, suspended residue, chlorophyll-a, NH3-N, TKN-N, NO2-NO3, Phosphorus, Cadmium, Chromium, Copper, Nickel, Lead, Zinc, Aluminum, Iron, Manganese, Mercury, Arsenic, and Hardness. http://lcfrp.uncw.edu/riverdatabase/queryAll.php?type=parameter.

[47] *See* 15A N.C. Admin. Code 2B .0101(b) (stating that the EMC may only make a classification determination after "appropriate studies of the identified waters to obtain the data and information required for determining the proper classification of the waters or segments of water are completed").

[48] Robert T. McAdory, Jr., *Cape Fear-Northest Cape Fear River, North Carolina, Numerical Model Study* (August 2000), *available at* http://acwc.sdp.sirsi.net/client/search/asset/1000633. Also, data collected by the US Geological Survey (USGS) at Lock & Dam 1 upstream of the affected segment shows that since 1982, the monthly mean discharge has ranged from 9,740 ft3/s in March to 2,940 ft3/s in August. *See* USGS, *Monitoring Station 02105769 on the Cape Fear River at Lock #1 near Kelly, NC* (2015),

Oceanic and Atmospheric Administration predicts that velocities at a monitoring station in the segment of the Cape Fear River proposed for reclassification will reach as high as 2.4 knots (4.1 ft/s) in 2015.[49] For comparison, the average velocity of the Mississippi River is near 1.2 miles per hour (1.8 ft/s) at the headwaters and 3 miles per hour (4.4 ft/s) near New Orleans.[50] Relatively high flow rates have also been documented in studies comparing the Cape Fear River estuary to others in the Southeast.[51] Indeed, the flushing effect of the high-velocity flow of the Cape Fear River has been credited with limiting the prevalence of harmful algal blooms,[52] influencing the migration patterns of local aquatic life,[53] and affecting the location of saltwater intrusion in the estuary.[54]

It would be contrary to the plain language of the law to apply to the fast-moving main stem of the Cape Fear River a "swamp water" classification reserved for waters with "low velocities" or "very low velocities." The EMC should not ignore the definition of the classification—which, critically, includes the velocity—in order to permit lower standards for DO and pH in a high-velocity segment of the river.[55] Notably, in addition to explicit consideration of velocity, the definition of "swamp waters" contemplates waters with "natural characteristics which are different from adjacent streams."[56] Yet Petitioners' argument rests on the alleged *similarity* of natural characteristics in adjacent streams.[57] The EMC should apply its

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http://waterdata.usgs.gov/nwis/monthly/?search_site_no=02105769&agency_cd=USGS&referred_module=sw&format=sites_selection_links.

[49] National Oceanic and Atmospheric Association, *Tides and Currents—2015 Tidal Current Predictions* (2015), http://tidesandcurrents.noaa.gov/get_predc.shtml?year=2015&stn=5133+Charleston Harbor&secstn=Wilmington&sbfh=%2B3&sbfm=52&fldh=%2B4&fldm=07&sbeh=%2B2&sbem=48&ebbh=%2B3&ebbm=07&fldr=0.8&ebbr=0.7&fldavgd=337&ebbavgd=153&footnote=

[50] U.S. National Park Service, Mississippi River Facts (2015), http://www.nps.gov/miss/riverfacts.htm

[51] Richard Dame et al, *Estuaries of the South Atlantic Coast of North America: Their Geographical Signatures*, 23 Estuaries 798 t.1 (2000). Of particular relevance, the data showed higher velocity flows in the Cape Fear estuary than in either the Pamlico or Neuse River estuaries. *Id.*

[52] Michael Mallin et al, *North and South Carolina Coasts*, 41 Marine Pollution Bulletin 56, 58 (2000) ("Well-flushed sounds or unconstrained rivers (such as the Cape Fear system) maintain much lower phytoplankton biomass and productivity."); *id.* at 60 (Well-flushed systems like euhaline sounds, and open rivers like the Cape Fear rarely host algal blooms)

[53] Michael P. Weinstein et al, *Retention of Three Taxa of Postlarval Fishes in an Intensively Flushed Tidal Estuary, Cape Fear River, North Carolina*, 78 Fishery Bulletin 419 (1980) (noting that "[t]idal velocities in the Cape Fear are high" and observing behavioral responses that enable fish to "avoid being flushed seaward"), *available at* http://fishbull.noaa.gov/78-2/weinstein.pdf.

[54] May Ling Becker, *Hydrodynamic Behavior of the Cape Fear River and Estuarine System: A Synthesis and Observational Investigation of Discharge-Salinity Intrusion Relationships*, 88 Estuarine, Coastal and Shelf Science 407 (May 2010).

[55] N.C. Gen. Stat. § 143-214.1.

[56] 15A N.C. Admin. Code 02B .0101(e)(2); 15A N.C. Admin. Code 02B .0301(c); see also 15A N.C. Admin. Code 02B .0202(62) (noting that swamp waters have, other than characteristically low velocity, "other characteristics which are different from adjacent streams draining steeper topography.").

[57] Petitioners contend that changing the classification of the river would "recognize the influence" of "riverine wetland and salt marsh systems that are ubiquitous" in the region and "be consistent with the classifications of [the] immediate upstream segment of the Cape Fear River and the tributaries which all currently carry the supplemental Sw classification." Chris May, Request for Reclassification of a Portion of the Lower Cape Fear River with the Supplemental Swamp Classification (March 5, 2014).

own definition of "swamp waters" and reject the proposal to misapply that supplemental classification to the lower Cape Fear River.

V. The EMC Must Not Prioritize Wastewater Discharge over Best Usage

In addition to ignoring the definition of "swamp waters" adopted by the EMC, Petitioners ignore the very purpose of classification: to protect the best usage of the water body. Petitioners make no argument that reclassification would protect the "best usage" of the segment in question. Nor do they challenge the State's oft-repeated observation that low pH and DO levels have impaired existing use of the river by aquatic life in the segment.[58] Indeed, Petitioners make no attempt to argue that classifying the river as "swamp waters" would adequately protect use of the river by aquatic life.[59]

Instead, Petitioners focus on *their* use of the river. Petitioners want the EMC to relax water quality standards so they can discharge wastewater into the river without implementing additional pollution controls necessary to protect aquatic life.[60] In other words, rather than trying to meet current standards designed to protect the best usage of the waters, Petitioners want the standards changed to accommodate their preferred usage. Since federal law explicitly prohibits the State from adopting "waste assimilation" as a designated use of the Cape Fear River,[61] Petitioners are asking the EMC to reclassify the river in a way that would allow their continued use of the river for precisely that purpose to the detriment of other designated uses.

To be clear, no one is arguing that Petitioners must stop discharging wastewater into the river. The water quality standards in place were drafted in contemplation of the effect of "the discharge of sewage, industrial wastes or other wastes including those from nonpoint sources and other sources of water pollution."[62] However, reclassification for the purpose of masking the impact of such water pollution on aquatic life is unacceptable.[63] If Petitioners want permission from the EMC to discharge effluent with pH and DO concentrations below those appropriate for class SC waters, they should seek a variance through the permitting process.[64] But the EMC must

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[58] *See, e.g.*, NC DENR, *North Carolina 303(d) List-2006* 19 (June 19, 2007) (noting impairment of use by aquatic life); NC DENR, *2014 Category 5 Water Quality Assessments-303(d) List* 3 (Dec. 19, 2014) (same).

[59] *But see* 40 C.F.R. § 131.10(a)(1) ("Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.").

[60] Current impairment of use of the river by aquatic life requires the development and implementation of a TMDL, which would include waste load allocations applicable to Petitioners.

[61] 40 C.F.R. § 131.10 ("In no case shall a State adopt waste transport or waste assimilation as a designated use for any waters of the United States.").

[62] 15A N.C. Admin. Code 2B .0205.

[63] *See* N.C. Gen. Stat. § 143-214.1(b) (directing the EMC to adopt classifications "with primary reference to the best usage to be made of the waters to which such classification will be assigned").

[64] N.C. Gen. Stat. § 143-215.3(e); 15A NCAC 2B.0226 ("Variances from applicable standards, revisions to water quality standards or site-specific water quality standards may be granted by the Commission on a case-by-case basis pursuant to G.S. 143-215.3(e), 143-214.3 or 143-214.1."). That way, their exemption, if granted from existing water quality standards could at least be reviewed as part of the triennial review of water quality standards required under federal law. *See* 15A N.C. Admin. Code 2B .0226.

not pretend that the "best usage" of the river is achieved through attainment of uncharacteristically and unnaturally low pH and DO standards that are associated with swamp waters.

Petitioners do not deny that their discharges contribute to the current impairment of the "best usage" of the river by aquatic life. This impairment was first recognized in 1998, when DENR observed that low DO concentrations meant the river was only providing "partial support" for designated use and opined that Petitioners may be to blame.[65] Even the materials offered in support of their petition establish that Petitioners' discharge contributes to the low pH and DO conditions observed in the river, although Petitioners maintain that their impact is "minor."[66]

Petitioners cite studies which they believe demonstrate that even with significant reductions in pollutant loads, dissolved oxygen in the lower Cape Fear River would occasionally fall below the current standard during summer months.[67] Petitioners apparently assume that aquatic life cannot be adequately protected if, following implementation of additional pollution controls, occasional seasonal drops in pH and DO are observed.[68] Consequently, they want the EMC to assign to the river a classification that would avoid the need to implement those additional pollution controls. Yet, when classifying the lower Cape Fear River as Class SC waters, the EMC recognized that "natural waters may on occasion, or temporarily, have characteristics outside of the normal range established by the standards" and "water quality standards will not be considered violated when values outside the normal range are caused by natural conditions."[69] In other words, the current SC classification is designed to protect use of the river for aquatic life propagation and survival *despite* occasional periods of low DO and pH in the summer months caused by natural conditions.[70] Since use of the river for aquatic life propagation and survival is possible with reasonable pollution control, the EMC should reject the proposal to lower water quality standards through reclassification and instead attempt to actually control pollution that is impairing existing use of the river by aquatic life.[71]

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[65] NC DENR, North Carolina's 1998 303(d) List T-6 (May 15, 1998) (Noting that of the 7,500 acres providing only "partial support" of designated uses, 5,000 were impaired by DO and listing wastewater treatment plants as a source of the impairment.), *available at* http://portal.ncdenr.org/c/document_library/get_file?uuid=2284d944-2134-4c57-a2d9-499c58076d4a&groupId=38364

[66] Letter from Chris May, Chair, Lower Cape Fear River Program Advisory Board, to Tom Reeder, Director, DENR-Division of Water Resources D-4 (March 5, 2014).

[67] *Id.* at D-5.

[68] Notably, oxygen solubility decreases with increasing water temperatures, so lower DO in warmer summer months is unremarkable.

[69] 15A N.C. Admin. Code. 2B .0205.

[70] Even if summertime exceedances of WQS could merit reclassification, there may exist reasonable alternatives to lowering the standards for the entire year. See 40 C.F.R. § 131.10(f) ("States may adopt seasonal uses as an alternative to reclassifying a water body or segment thereof to uses requiring less stringent water quality criteria. If seasonal uses are adopted, water quality criteria should be adjusted to reflect the seasonal uses, however, such criteria shall not preclude the attainment and maintenance of a more protective use in another season.").

[71] 40 C.F.R. § 131.10(d) (stating that "uses are deemed attainable if they can be achieved by the imposition of effluent limits . . . and cost-effective and reasonable best management practices for nonpoint source control").

By lowering pH and DO standards through reclassification, the EMC would instead further limit use of the river by aquatic life, the very use that has long been impaired by pH and DO levels, by allowing persistent, rather than occasional, conditions of low pH and DO. Essentially, reclassification would serve to authorize increased water pollution by existing point and nonpoint sources. The EMC must not apply a classification that would effectively remove an existing use.[72]

In sum, the proposal under consideration would see the EMC abandon efforts to protect the best usage of the Cape Fear River by aquatic life and instead substantially lower the applicable water quality standards for pH and DO to appease polluters who would otherwise be required to limit their pollution of North Carolina's waters. Rather than bless the degradation of water quality and wildlife habitat in the river, the EMC should reject the proposal to reclassify the Cape Fear River as swamp waters.

VI. The EMC Should Protect Use of the Cape Fear by Aquatic Life

The use of the lower Cape Fear River for the survival and propagation of aquatic life is too important to ignore or restrict through reclassification. Petitioners note that the segment in question was once classified as swamp waters, but fail to mention that the State explicitly admitted that this was the result of inadequate consideration of the best usage of the waters by aquatic life.[73] In 1981, the EMC observed that "a low pH is detrimental to shellfish propagation" and that "it is incompatible to have a classification of SA-Sw" in the lower Cape Fear River.[74] Accordingly, the EMC removed the swamp waters classification from the segment Petitioners now seek to have reclassified, as it was immediately upstream of waters classified for commercial production of shellfish and removal of the swamp waters designation was necessary to prevent impairment of the best usage of those downstream waters.[75]

In other words, swamp water classification was removed from this segment to protect aquatic life; the EMC should not repeat the mistake of ignoring effects on aquatic life by again classifying the river as swamp waters. As noted above, higher pH and DO concentrations are required to protect aquatic species unaccustomed to life in stagnant swamp waters. Low pH is

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[72] 40 C.F.R. § 131.10(h)(1) (prohibiting removal of an existing use unless a use requiring more stringent criteria is added). As previously discussed, swamp water classification involves less stringent criteria than are otherwise applicable to SC waters. At minimum, the State should conduct a use attainability analysis before applying a supplemental classification which requires less stringent criteria. 40 C.F.R.§ 131.10(j)(2).

[73] N.C. Dep't of Natural Resources and Community Development, Report of Proceedings Concerning the Proposed Reclassification of South Creek in the Tar-Pamlico River Basin and the Removal of the Swamp Water Designation from Waters in the Neuse River Basin and Cape Fear River Basin ii (1981) ("As a low pH is detrimental to shellfish propagation, it is incompatible to have a classification of SA-Sw. When the original classification of all river basins was done, this fact was recognized in all basins except the Neuse and Cape Fear.").

[74] *Id.*

[75] The segment Petitioners now seek to reclassify was immediately upstream of waters classified for commercial production of shellfish and removal of the swamp water designation was necessary prevent impairment of the best usage of those downstream waters. 40 C.F.R. § 131.10(d) ("In designating uses of a water body and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters."); 15A N.C. Admin. Code. 2B .0203.

particularly dangerous for shellfish, as noted when the EMC classified the segment as Class SC. Moreover, the portion of the river proposed for reclassification plays a critical role in the early life cycles of aquatic life and is home to endangered species.

In late winter, migratory fish including striped bass, Atlantic sturgeon, and American shad migrate from the ocean and lower Cape Fear estuary to spawn upstream in the main stem of the Cape Fear River.[76] Although adult fish return to the ocean or lower estuary after spawning, juveniles remain in nursery habitats through the summer before migrating seaward in late fall.[77] The segment proposed for reclassification includes habitat designated as primary nursery areas by the Division of Marine Fisheries (DMF).[78] Primary nursery areas (PNAs) are those "in the estuarine system where initial post-larval development takes place" and "populations are uniformly early juveniles."[79] The affected segment is also designated as an anadromous fish spawning area (AFSA) by DMF and the Wildlife Resources Commission.[80] This means "evidence of spawning anadromous fish has been documented in [DMF] sampling records through direct observation of spawning, capture of running ripe females, or capture of eggs or early larvae."[81]

Although swamp water classification is not entirely inconsistent with labeling waters as a PNA or AFSA, care must be exercised to avoid inappropriate swamp water classification that would impact finfish at early stages of development. Low dissolved oxygen levels can be particularly problematic in spawning and nursery areas because hypoxia "causes substantial mortality of developing embryos."[82] For this reason, EPA recommends more stringent dissolved oxygen criteria for the early life stages of both coldwater and warmwater fish.[83]

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[76] Cape Fear River Partnership, Cape Fear River Basin Action Plan for Migratory Fish 18 (April 2013), *available at* http://www.habitat.noaa.gov/protection/capefear/pdf/CapeFearActionPlan.pdf

[77] *Id.*

[78] 15A N.C. Admin. Code 3R .0103.

[79] 15A N.C. Admin. Code 3I .0101; *see also* 15A N.C. Admin. Code 2B .0202 ("Primary Nursery Areas (PNAs) are tidal saltwaters which provide essential habitat for the early development of commercially important fish and shellfish and are so designated by the Marine Fisheries Commission.").

[80] 15A N.C. Admin. Code 3R .0115(25); see also Division of Marine Fisheries, Anadromous Fish Spawning Areas (AFSA): Cape Fear River Area, Map 7, *available at* http://portal.ncdenr.org/c/document_library/get_file?uuid=f810ae29-ea4d-4801-a04f-850ff2bc4467&groupId=38337

[81] Anadromous fish spawning areas are those "where evidence of spawning anadromous fish has been documented in Division sampling records through direct observation of spawning, capture of running ripe females, or capture of eggs or early larvae." 15A N.C. Admin. Code 3I .0101(4)(b).

[82] Denise L. Brietburg et al, Hypoxia, Nitrogen, and Fisheries: Integrating Effects Across Local and Global Landscapes, 1 Annual Review of Marine Science 333 (2009)("Developing embryos are particularly sensitive because they lack the ability to behaviorally respond to low oxygen and because oxygen must diffuse across the chorion that encases the embryo."), *available at* http://moritz.botany.ut.ee/~olli/eutrsem/Breitburg09.pdf.

[83] US EPA, *Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras*, app. I (Nov. 2000), *available at* http://water.epa.gov/scitech/swguidance/standards/upload/2007_03_01_criteria_dissolved_docriteria.pdf.

In addition to playing a role in the life cycles of multiple fish species, the lower Cape Fear River is home to two endangered species of sturgeon, suggesting a need for more stringent environmental protection.[84] "Maintenance and recovery of the water quality conditions required to sustain and recover federally-listed threatened and endangered aquatic animal species contributes to the support and maintenance of a balanced and indigenous community of aquatic organisms and thereby protects the biological integrity of the waters."[85] As such, the EMC should refrain from classification that could instead prove harmful to endangered aquatic life.

First, the lower Cape Fear is home to the Atlantic sturgeon, a species that NOAA's National Marine Fisheries Service first listed as endangered in 2012. Although the harvest of Atlantic sturgeon has been banned since 1991, the Atlantic States Marine Fisheries Commission (ASMFC) has stated that fishery management measures alone will not sustain stocks of Atlantic sturgeon without sufficient quality and quantity of habitat. As such, it bears emphasis that the estuarine waters of the lower Cape Fear river are precisely the type where juvenile Atlantic sturgeon "for months to years before emigrating to open ocean."[86] Moreover, ASMFC studies demonstrate that DO concentration is a "key habitat parameter[] for the structuring of juvenile Atlantic sturgeon habitat."[87] The EMC should not lower water quality standards in the Cape Fear and thereby further threaten the survival of this species.

The Lower Cape Fear also hosts a population of shortnose sturgeon, a species recognized by the federal government as endangered in 1967 and subject to a fishing moratorium since 1991. Juvenile shortnose sturgeon tend to locate in estuarine waters such as those in the segment proposed for reclassification. Consequently, "protection of essential habitats, especially nursery/summer habitats, from human caused dissolved-oxygen reductions and other impacts is critical."[88] The EMC should not relax such protection and subject this already endangered species to additional environmental stressors.

Instead, the EMC should hold the line in the fight against degrading water quality in the lower Cape Fear River. Petitioners would have the State simply quit trying to protect this resource for use by aquatic life that requires "normal" pH levels above 6.8 and/or DO levels of above 5.0 mg/L. Petitioners essentially claim that because their best efforts will not achieve universal year-round attainment of desired pH and DO levels and eliminate all naturally caused occasional exceedances of current standards, those standards should be replaced with standards designed to allow persistent low DO and pH levels to protect use of different aquatic environments. The EMC should not accept Petitioner's invitation to view the perfect as the

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[84] *See* Mary L. Moser & Steve W. Ross, *Habitat Use and Movements of Shortnose and Atlantic Sturgeon in the Lower Cape Fear River, North Carolina*, 124 Transactions of the American Fisheries Society 225 (1995).
[85] 15A N.C. Admin. Code 2B .0110.
[86] Atlantic Marine Fisheries Commission, *Habitat Addendum IV to Amendment I to the Fishery Management Plan for Atlantic Sturgeon* 2(Sept. 2012), *available at* http://www.asmfc.org/uploads/file/sturgeonHabitatAddendumIV_Sept2012.pdf
[87] *Id.*at 3.
[88] Mark R. Collins et al, *Primary Factors Affecting Sturgeon Populations in the Southeastern United States: Fishing Mortality and Degradation of Essential Habitats*, 66 Bulletin of Marine Science 917, 917 (2000), *available at*

enemy of the good. Instead, we urge the EMC to continue to manage the lower Cape Fear River so as to provide for the best usage of the water body.

VII. Management Plan

The management plan suggested by Petitioners is not designed to achieve best usage of the river and should also therefore be rejected by the EMC. Water quality management plans are supposed to be developed "to attain, maintain or enhance water quality."[89] Yet, the proposed management plan is only being put forth in recognition of the fact that classifying the lower Cape Fear River as swamp waters would lower water quality standards. As explained above, the best way for the EMC to attain, maintain or enhance water quality is to leave in place existing water quality standards and strive to attain them. Instead, the EMC is considering a management plan that starts from the premise that target goals for pH and DO in the river should be lowered.

There are a number of problems with the management plan beyond the fact that it represents a refusal to manage the river to achieve its currently defined "best usage." To begin, the plan would only apply to "new individual NPDES wastewater discharges and expansions of existing NPDES wastewater dischargers." As such, no currently permitted operations would be impacted (i.e., the effluent limits expressed in Petitioner's current NPDES permits would not be amended). In other words, just as Petitioners seek to minimize their responsibility for existing impairment of aquatic life use in the river, they also seek to minimize their responsibility for improving conditions in the river. Moreover, while Petitioners point to studies claiming that point sources contribute less than 10% of the waste load in the River, they propose a management plan that would do little to actually limit point source loading. First, due to its limitation to "individual" NPDES permittees, the management plan would not even apply to point sources operating under a general NDPES permit. The plan further limits its applicability to point sources with a provision noting that the State can impose "seasonal effluent limits for oxygen-consuming waste" on a "case-by-case basis in accordance with 15A NCAC 2B .0404." And even after substantial limitation, the management plan would not apply to point source loading in the tributaries that Petitioners claim are feeding low pH and DO waters into the segment they seek to protect through this management plan. In sum, the proposal would have the EMC adopt a management plan that applied only to a subset of point sources, only in the event of new or expanded operations, only if the permittee was not granted an exemption, and only in the area of the river where Petitioners insist point source waste loading is not resulting in impairment.[90]

Still, the greatest flaw of this management plant is that it makes no attempt to address the contribution of nonpoint sources to water pollution in the river, which are largely to blame for conditions in these tributaries. Most of the Concentrated Animal Feeding Operations (CAFOs) in the Cape Fear River basin, which produces 50% of North Carolina's swine and large numbers

[89] *See* 15A NCAC 02B .0227.

[90] *See* Letter from Chris May, Chair, Lower Cape Fear River Program Advisory Board, to Tom Reeder, Director, DENR-Division of Water Resources D-18 (March 5, 2014) (claiming that the lower Cape Fear River estuary lacks "sensitivity to changes in point source loads").

of poultry, are in watersheds drained by blackwater streams.[91] Petitioners ignore scientific analysis showing that poorly regulated waste management practices of CAFOs mean that "large amounts of nitrogen and phosphorus enter the environment through runoff, percolation into groundwater, and volatilization of ammonia,"[92] all of which can exacerbate DO and pH levels. Indeed, Petitioners ignore data published on their own website showing a statistically significant increase in ammonium in the Northeast Cape Fear River (one of the tributaries Petitioners blame for impairment of the Cape Fear River) suggesting water quality degradation by animal farming operations.[93] "Hypoxia is regulated primarily by controlling nutrients (largely nitrogen) and other oxygen-demanding wastes."[94] Yet, the proposed management plan would neither attempt to limit nonpoint source loading of nutrients and oxygen-demanding waste in the segment Petitioners seek to reclassify nor address considerable loading in upstream tributaries that Petitioner's blame for currently impaired use of the river.

Lastly, the management plan does little to ensure its own effectiveness. The proposed language states that any new or expanded discharge "shall not cause the dissolved oxygen of the receiving water to drop more than 0.1 mg/L below the modeled in-stream dissolved oxygen at total permitted capacity." Again, the plan fails to require monitoring or reduction of the effects of pollutant loading by *existing* point sources or nonpoint sources. And, despite current impairment caused by low pH in the river, the plan would not monitor the effect on pH of additional pollutant loading. The plan also fails to explain how the State will identify the cause of potential future decreases of DO concentration; this is particularly problematic given that Petitioner's reclassification request highlights the difficulty of pinpointing the cause of decreases in DO concentration. Nor is there any explanation of how frequently waters will be monitored under the plan or how the prohibition against causing DO decreases will be enforced, if at all. Finally the plan makes no mention of biological monitoring to ensure that use of the river for aquatic life survival and propagation is actually improving.

Indeed, by disregarding its effect on aquatic life, the management plan bears strong resemblance to the associated reclassification proposal. The EMC should not grant Petitioner's request for permission to further impair use of the Cape Fear River by aquatic life, but should instead continue efforts to develop an appropriate Total Maximum Daily Load (TMDL) and strive to achieve currently applicable water quality standards.

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[91] Michael A. Mallin & Lawrence B. Cahoon, *Industrialized Animal Production—A Major Source of Nutrient and Microbial Pollution to Aquatic Ecosystems*, 24 Population and Environment 369, 369 (2003).
[92] *Id.* at 379.
[93] *Id.* at 376 (citing data "published by the Lower Cape Fear River Program (available at the website http://www.uncwil.edu/cmsr/aquaticecology/labrotory/lcfrp)
[94] US EPA, *Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras*, at v (Nov. 2000), *available at* http://water.epa.gov/scitech/swguidance/standards/upload/2007_03_01_criteria_dissolved_docriteria.pdf.

VIII. Conclusion

For more than 30 years, the EMC has concluded that the best usage of the lower Cape Fear by aquatic life is protected by the water quality standards for pH and DO associated with Class SC waters and that swamp waters classification was not appropriate for that segment. More recently, the EMC has recognized that usage of the lower Cape Fear River by aquatic life is impaired by low pH and DO concentrations. The State should not abandon efforts to return these waters to the conditions that support their best usage. Rather than grant its imprimatur to increasing water pollution, the EMC should continue to strive to "maintain, protect, and enhance water quality within North Carolina.[95] Accordingly, we urge the EMC to reject the proposal to adopt the proposed classification and management plan.

Thank you for the opportunity to comment on this important matter.

Sincerely,

Will Hendrick

cc (by email):
Lauren Pedder, USEPA- Region 4
Peter Raabe, American Rivers
Grady McCallie, North Carolina Conservation Network
Kemp Burdette, Cape Fear RIVERKEEPER®
Julie Youngman, Southern Environmental Law Center

[95] N.C. Gen. Stat. § 143-215.2(b).

March 3, 2015

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RE: Comments on Proposed reclassification of portions of the Cape Fear River

Dear Ms. Kountis:

On behalf of the Cape Fear River Watch, Cape Fear Riverkeeper and Waterkeeper Alliance, we are submitting the following comments pursuant to the Notice issued by your office for the proposal captioned "Proposed Swamp Reclassification with Water Quality Management Plan for Part of Cape Fear River." This proposed reclassification apparently originated from a request on behalf of persons who had been meeting to discuss the development and implementation of a Total Maximum Daily Load for the Lower Cape Fear River.[1] Based upon review of the materials presented, as well as readily available peer-reviewed literature, this proposal suffers the following deficits: constitutes an unlawful attempt to evade the Clean Water Act's directives to correct water quality problems through implementation of Total Maximum Daily Load requirements and to prevent backsliding on Water Quality Standards once they are set; violates the policy declared by the State's constitution and implementing statutory directives to the North Carolina Environmental Management Commission (Commission) and the North Carolina Department of Environment and Natural Resources (Department) to protect and conserve the waters of the state for the benefit of all its citizens; fails to correct the water pollution created by Animal Operations under the regulatory authority of the Commission and CAFOs as regulated by the Clean Water Act, which together are causing impairments for copper, turbidity, pH and low dissolved oxygen (DO); lacks scientific support; and does not comply with the requirements of the North Carolina Administrative Procedures Act (APA).

[1] The letterhead of the request is the Lower Cape Fear River Program, but the request is signed by Chris May, identified as the Executive Director of the Cape Fear Council of Governments. We raise this issue in order to preserve, in any subsequent appeal, the question as to whether Mr. May was acting with actual authority on behalf of a person with legal power to make the request.

I. The Clean Water Act Requires the State of North Carolina to Implement a Total Maximum Daily Load Allocation in the Cape Fear River

The Lower Cape Fear River (LCFR) presents the classic situation that the Clean Water Act (CWA) provisions on Total Maximum Daily Load (TMDL) were designed to address: chronic violations of water quality standards that NPDES-imposed effluent limitations alone are unable to correct. The modern-day CWA was first passed in 1972 in response to growing concern about the continued degradation of many major rivers under inadequate state regulatory schemes. The CWA's stated objective is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." CWA § 101(a). To achieve this objective, the CWA lays out several goals, including the elimination of the discharge of pollutants into navigable waters. The statute sets up several programs to achieve these goals, including the TMDL process.

A. State Water Quality Standards Must Meet CWA Minimum Requirements and Protect Designated Uses

State water quality standards must be approved by the United States Environmental Protection Agency under § 303 of the Clean Water Act, 33 U.S.C. § 1313. Under the Clean Water Act, water quality standards consist of three elements: (1) one or more existing or designated "uses" of a water body (such as fish and aquatic life, fishing, boating, aesthetic quality, irrigation and water supply), (2) water quality "criteria" indicating the amount of a pollutant that may be present in the water body while still protecting the uses, and (3) a provision restricting degradation of certain types of waters. When met, these standards must be stringent enough to protect the designated uses. States are responsible for enforcing their water quality standards on intrastate waters. See 33 U.S.C. § 1319(a).

B. North Carolina's General Statutes Require More Protection of Uses than the CWA Minimum Requirements

Under the provisions of Article 21 of Chapter 143, the North Carolina General Assembly has set forth guidelines for the Commission to use when enacting water quality standards and specifically sets forth criteria more stringent and more specific than the Clean Water Act. North Carolina's standards must be designed to:

1) protect human health,
2) prevent injury to plant and animal life,
3) prevent damage to public and private property,
4) insure the continued enjoyment of the natural attractions of the State,
5) encourage the expansion of employment opportunities,
6) provide a permanent foundation for healthy industrial development,
7) secure for the people of North Carolina, now and in the future, the beneficial uses of these great natural resources.

See N.C. Gen. Stat. § 143-211(c).

State water quality standards established under § 303 provide an important "supplementary basis . . . so that numerous point sources, despite individual compliance with effluent limitations, may be further regulated to prevent water quality from falling below acceptable levels." EPA v. California ex rel. State Water Res. Control Bd., 426 U.S. 200, 205 n.12 (1976). States therefore may impose more stringent water quality controls. See 33 U.S.C. § 1311(b)(1)(c). The CWA standards are a floor, but states are expected to set standards to protect uses based on the water quality issues in their waters. For example, North Carolina requires that water quality standards ensure "the ability of an aquatic ecosystem to support and maintain a balanced and indigenous community of organisms . . . . " 15A NCAC § 2B.0202(11).

Numerous state water quality issues are implicated within the Cape Fear River basin and the State has adopted a broad array of requirements affecting water quality to protect the public welfare and serve the purposes of the Clean Water Act. For the portions of the Cape Fear River system classified as Class SC waters, state regulations provide specific water quality criteria implicated by these classifications. These include chlorophyll, dissolved oxygen, solids or sludge attributable to wastes, dissolved gases, fecal coliform, pH, oils, temperature, turbidity, toxic substances, pesticides, and metals, among others. See15A NCAC § 02B .0220 The Lower Cape Fear River fails to meet the standards imposed for DO, pH, turbidity, and copper. Consequently, the state is required to identify the sources that contribute to these violations and then take corrective action. "[S]ources of water pollution which preclude any of these uses on either a short-term or long-term basis shall be considered to be violating a water quality standard." 15A NCAC § 2B.0211(2).

C. CWA Requires North Carolina to Allocate Pollutant Loading From Point Sources, Including CAFOs, and From Nonpoint Sources Under TMDL

The CWA requires states to address both point sources[2] and nonpoint sources in order to protect designated uses. Under the CWA scheme, states must designate uses for waterbodies within the state and then develop water quality standards for those waterbodies to ensure achievement of the designated uses. Effluent limitations must be imposed on every point source discharger, including concentrated animal feeding operations (CAFOs),[3] in an effort to meet the water quality standards and maintain the designated uses. Waterbodies that do not meet their standards are placed on the 303(d) list of impaired waters. For those waterbodies, the states must develop TMDLs for the contaminant(s) causing the violation to return the waters to the standards appropriate for the designated use. To achieve a TMDL, CWA § 303 requires the state to undergo a

[2] CWA § 502(14) defines "point source" as "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged."

[3]As discussed more in Section III, North Carolina also regulates all Animal Operations activities involving Animal Waste, even when these operations have not been designated as CAFOs. We do not endorse the Department's decision to use general permits for Animal Operations in this basin and have previously commented on the inadequacy of those permits to prevent the types of problems seen in the LCFR.

continuing planning process and determine appropriate load allocations for all sources, whether categorized as point or nonpoint. The TMDL must consider point and nonpoint sources contributing to impairment and not merely those adjacent to the impaired stretch. The state must incorporate the TMDL waste load allocations into the NPDES permits for each point source discharger and the load allocation for nonpoint sources are to be implemented through regulatory, non-regulatory and voluntary compliance mechanisms depending on the source.

Since 1998, the LCFR segment from upstream of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut has been on North Carolina's 303(d) list of impaired waters due to low dissolved oxygen (DO). In 2006, the state added impairment for pH, copper, and turbidity to the 303(d) list for this segment. The CWA requires the state to develop a TMDL for the impairing pollutants and then incorporate the TMDL into NPDES permits for point sources and controls on nonpoint sources necessary to meet the loading limits in the state plans.[4] For example, TMDLs are to be incorporated into the state's Water Quality Management Plan, which must also include effluent limitations and the regulatory, non-regulatory, and other mechanisms necessary to control nonpoint sources and meet water quality standards. The proposed reclassification would avoid this process and allow the waterbody to violate the 5 mg/L DO standard. In doing so, it fails to further the goals of the CWA and violates its express provisions.

The CWA intends for TMDLs to cover pollution from point and nonpoint sources. The TMDL program sets the total amount of a pollutant that a waterbody can assimilate while still achieving its designated uses. The state must set the TMDL with an eye toward the designated use, and then must manage its contributing point and nonpoint sources to meet the TMDL. The CWA requires states to incorporate the TMDL into NPDES permits for point sources and into the regulatory, non-regulatory and other actions in state plans for nonpoint sources. Thus, the TMDL process should comprehensively consider all sources, which this proposed reclassification fails to do by ignoring CAFOs and nonpoint sources. Further, CAFOs are defined as point sources within the CWA (and in more detail by EPA regulations). So, the statute is clearly and explicitly intended for the TMDL process to cover discharges from CAFOs. The proposed reclassification entirely ignores the discharges from these sources, even though there are millions of hogs, poultry, turkeys, and cattle in the basin that contribute to the violations of applicable water quality standards. The proposed reclassification is thus impermissible.

[4] See, e.g. 33 U.S.C. §§1313(e) and 1319; *Pronsolino v. Nastri, 291 F. 3d. 1123 (9th Cir. 2002)* (Upholding EPA's TMDL for a waterbody impaired solely by nonpoint source pollution); U.S. EPA What is a TMDL? http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/overviewoftmdl.cfm ("Load allocations (LAs) are implemented by nonpoint sources through a wide variety of state, local, and federal programs (which may be regulatory, non-regulatory, or incentive-based, depending on the program), as well as voluntary action by citizens.");

D. The Proposed Reclassification Violates the Anti-Degradation Provisions in Both State and Federal Law

The CWA also includes anti-degradation provisions that prohibit the states from allowing the degradation of navigable waters by lowering the standards to achieve compliance. See 33 U.S.C. § 1313(d)(4). Under the federal antidegradation policy, the states are required to develop and adopt statewide antidegradation policies that ensure that "existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." 40 C.F.R. § 131.12. North Carolina has incorporated this requirement by reference into its water quality standards, and further adopted the requirement that "[e]xisting uses, as defined by Rule .0202 of this Section, and the water quality to protect such uses shall be protected by properly classifying surface waters and having standards to protect these uses." 15A NCAC 02B § .0201 (a) and (b). Existing uses are defined as: "uses actually attained in the water body, in a significant and not incidental manner, on or after November 28, 1975, whether or not they are included in the water quality standards, which either have been actually available to the public or are uses deemed attainable by the Environmental Management Commission. At a minimum, uses shall be deemed attainable if they can be achieved by the imposition of effluent limits and cost-effective and reasonable best management practices (BMPs) for nonpoint source control." See 15A NCAC 02B § .0202(30). The proposed reclassification violates both the CWA and the state's supplemental antidegradation policy regulations because it will not protect and maintain the existing uses in the LCFR, would weaken water quality standards and would allow for further degradation of water quality.

Additionally, EPA regulations prohibit the removal of a designated use where that use is an existing use, which the EPA regulations define as uses "actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards." 40 C.F.R. § 131.10(h)(1). The EPA regulations deem a use attainable if it "can be achieved by the imposition of effluent limits required [for point sources] under sections 301(b) and 306 of the Act and cost-effective and reasonable best management practices for nonpoint source control." 40 C.F.R. §131.10(d). The EPA regulations also prohibit removing a designated use where "[s]uch uses will be attained by implementing effluent limits required under sections 301(b) and 306 of the Act and by implementing cost-effective and reasonable best management practices for nonpoint source control." 40 C.F.R. § 131.10 (h)(2). As demonstrated by materials submitted by the proponents of this reclassification and the comments of Dr. Burkholder set forth below, the SW classification protects an existing use and the designated uses for the LCFR can be achieved through reasonable pollution controls.

If these prohibitions did not apply, a state could seek to remove a designated use where naturally occurring pollutant concentrations prevent the attainment of the use: "States may remove a designated use which is not an existing use, as defined in § 131.3, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible because: (1) Naturally occurring pollutant concentrations prevent

the attainment of the use." See 40 C.F.R. § 131.10(g)(1). The supplemental Sw "Swamp" classification is an example of such a sub-category of use for SC waters of the LCFR. NC law builds upon these restrictions with supplemental provisions, allowing revision to the water quality standards if the naturally occurring pollutant concentrations are the result of natural background conditions.

Under NC law, "any person subject to the provisions of G.S. 143-215.1 may petition the Commission for a hearing pursuant to G.S. 143-215.4 for a revision to water quality standards adopted pursuant to G.S. 143-214.1 as such water quality standards may apply to a specific stream segment into which the petitioner discharges or proposes to discharge." See N.C. Gen. Stat. § 143-214.3. This section also sets forth the procedure and burdens of proof needed in making such a request. However, the provision specifies that revisions to water quality standards are permitted only when the proponent meets particular criteria, including proving that "natural background conditions on the stream segment preclude the attainment of the applicable water quality standards." As we set forth in Sections III and IV, the proposed reclassification does not meet that burden.

The Commission must also consider several matters prior to granting a reclassification request, including the following factors: "the use and value of State waters for public water supply, propagation of fish and wildlife, recreation, agriculture, industrial and other purposes, use and value for navigation, and ... an estimate ... of the environmental impact, the economic and social costs necessary to achieve the proposed standards, the economic and social benefits of such achievement and an estimate of the date of such achievement." N.C. Gen. Stat. § 143-214.1(d)(4). Since the CWA and its rules set the minimum requirements, this provision is supplemental to that which is required by the CWA's anti-degradation policy. It does not appear that the proponent has provided any support for the Commission to conduct such an analysis.

Thus, under the state and federal regulations, DWR would have to establish that the use is not an existing use, that the use cannot be attained by implementing effluent limits and nonpoint source controls, and that low DO in the LCFR is being caused by naturally occurring pollutant concentrations that make attainment of the use infeasible. This is a burden that cannot be met as set forth in greater detail below in Section III and IV, as well as attached comments by Dr. Joann Burkholder, Ph.D. In any event, because the SC classification includes uses that are specified in CWA Section 101(a)(2), the state cannot remove a designated use or adopt subcategories of uses that require less stringent criteria without conducting a Use Attainability Analysis. See 40 CFR 131.10(j) and 131.3(g). The state has not done so in this instance and, thus, the Commission may not proceed with the reclassification.

II. North Carolina Law Requires the Environmental Management Commission to Correct Impairments Including Low Dissolved Oxygen in LCFR

North Carolina's Constitution and its General Statutes require the Commission to correct pollution in the Cape Fear River to support fish and other aquatic life. The fisheries resources are public trust assets, as are the waters of the Cape Fear River itself. Now that the Commission has designated uses for the Cape Fear River, studied the causes of its impairment and evaluated measures for correcting the same, the Commission must act to correct the problems identified. Reclassifying the Cape Fear River to swamp waters does not fulfill the duties entrusted to the Commission by North Carolina's laws.

More generally, a reclassification and a codification of rules that allow for worsened water quality clearly violate North Carolina's Constitution, which imposes a duty of water quality protection upon this Commission:

> "It shall be the policy of this State to conserve and protect its lands and waters for the benefit of all its citizenry, and to this end it shall be a proper function of the State of North Carolina and its political subdivisions to acquire and preserve park, recreational, and scenic areas, to control and limit the pollution of our air and water, to control excessive noise, and in every other appropriate way to preserve as a part of the common heritage of this State its forests, wetlands, estuaries, beaches, historical sites, openlands, and places of beauty." N.C. Const. Art. XIV, § 5.

The Commission must remember that the people have enshrined this duty in the Constitution of North Carolina. Limiting and controlling pollution is a duty of the State and all its political subdivisions. This provision imposes a duty on the Commission to carry out its powers to protect the lands and waters for the benefit of all its citizenry.

Forty years ago, our General Assembly advanced this Constitutional mission by enacting the General Statutes which protect these values, including the laws which empower the Department and the Commission, such as Chapters: 113, 113A, 113B, 130A, 130B, 132, 139, 143, 143B, 146, 150B, 156, 159, 159A, 159B, 159C, 159G and 162A. Among this comprehensive system of laws is found Article 21 of Chapter 143, captioned, "Water and Air Resources." Within Article 21, the General Assembly declares its intent for those laws: "to achieve and to maintain for the citizens of the State a total environment of superior quality. **Recognizing that the water and air resources of the State belong to the people, the General Assembly affirms the State's ultimate responsibility for the preservation and development of these resources** in the best interest of all its citizens and declares the prudent utilization of these resources to be essential to the general welfare." N.C. Gen. Stat. § 143-211(a) (emphasis added).

The General Assembly's enactments clearly show their intent to clarify the legal points that (a) water and wildlife resources belong to the people and (b) the State bears responsibility to preserve and develop these resources as a public trust. This trust may

not be devolved to private interests through permits or approvals that give perpetual rights to pollute and degrade the public trust resources of the people. See N.C. Const. art. I, §§ 32 and 34.

Under the provisions of Article 21 of Chapter 143, the North Carolina General Assembly has set forth the guidelines for the Commission to use when enacting these standards and specifically sets forth criteria more stringent and more specific than the Clean Water Act. At the core of EPA-approved state water quality standards under 33 U.S.C. § 1313, states are responsible for enforcing their water quality standards on intrastate waters. See 33 U.S.C. § 1319(a).

In setting water quality standards, the General Assembly directed the following be considered: "Standards of water and air purity shall be designed to protect human health, to prevent injury to plant and animal life, to prevent damage to public and private property, to insure the continued enjoyment of the natural attractions of the State, to encourage the expansion of employment opportunities, **to provide a permanent foundation for healthy industrial development and to secure for the people of North Carolina, now and in the future, the beneficial uses of these great natural resources.**" N.C. Gen. Stat. § 143-211(c) (emphasis added). These provisions clearly show the recognition of a duty to protect uses of our state's waters for the benefit of today's users and those in the future. Removing the protections from the Lower Cape Fear River does not meet the purposes of North Carolina's Constitution, Law or Rules.

III. Neither the Low DO Conditions Nor the Animal Wastes That Cause Them are Naturally Occurring

As stated above, the proposed reclassification violates numerous provisions of state and federal laws relating to TMDLs, water quality standards, antidegradation policies, and the requirements for removing and establishing designated uses. These hurdles cannot be overcome. However, assuming for the sake of discussion that they could, under North Carolina and federal law, the Commission would have to determine that natural background conditions on the stream segment preclude the attainment of the use in order to consider the proposal. N.C. Gen. Stat. § 143-214.3; 40 C.F.R. 131.10(g)(1). The burden of proof is on the applicant to prove this to the Commission. Neither the applicant nor the Commission can meet this burden, and in any event, the Commission could not classify the LCFR as "swamp waters" as the river does not meet the regulatory definition which requires low velocities, among other things. See 15A NCAC 02B .0101(e)(2), 15A NCAC 02B .0202(62), 15A NCAC 02B .0301(c), and Comments of Dr. Burkholder.

A. North Carolina's Statutes Regulate Animal Operations, Feedlots and Animal Waste, Even When Not Designated as CAFOs, and Legally Recognize the Water Quality Problems Created by Livestock Manure[5]

North Carolina's General Assembly adopted laws to regulate Animal Operations and Feedlots in response to concerns that growth in the numbers of Animal Operations harmed water quality. As the General Assembly found, "The growth of animal operations in recent years has increased the importance of good animal waste management practices to protect water quality. It is critical that the State balance growth with prudent environmental safeguards." N.C. Gen. Stat. § 143-215.10A.

In addition, the General Assembly found the need to control and limit nutrients leaving the Animal Operations by specifying that Animal Waste be applied with careful attention to the both nitrogen and phosphorus as rate limiting elements for applying Animal Waste to land. See N.C. Gen. Stat. § 143-215.10C. The General Assembly also declared that zinc and copper levels in the soils shall be monitored, and alternative crop sites shall be used when these metals approach excess levels. These legislative requirements reflect specific legislative findings as to the water quality problems caused by excess nitrogen, phosphorus, zinc and copper.

These North Carolina legislative findings of fact are supported by studies from federal agencies. The United States Environmental Protection Agency ("EPA") and United States Department of Agriculture's ("USDA") have identified livestock manure as the largest cause of water quality impairment in the country's rivers, streams, lakes, ponds, and reservoirs, and the fifth leading contributor to impairment of estuaries.[6] They contribute to the impairment of approximately 37% of the nation's surveyed rivers and streams.[7]

North Carolina law defines Animal Waste to include livestock or poultry waste. N.C. Gen. Stat. § 143-215.10B. A feedlot is defined as a lot or building or combination intended for the confined feeding, breeding, raising, or holding of animals. N.C. Gen. Stat. § 143-215.10B. An Animal Operation is defined as a feedlot involving 250 or more swine, 100 or more confined cattle, 75 or more horses, 1,000 or more sheep, or 30,000 or

[5] North Carolina and the federal government provide different definitions for CAFOs, but these specific definitions and thresholds do not change the underlying arguments about the shortcomings of the current proposal. Just because the state has not identified something as a CAFO through its case-by-case assessment does not mean that it is not one.

[6] CLAUDIA COPELAND, CONG. RESEARCH SERV., RL31851, ANIMAL WASTE AND WATER QUALITY: EPA REGULATION OF CONCENTRATED ANIMAL FEEDING OPERATIONS (CAFOS) 4 (2002) (citing U.S. EPA, EPA-841-R-08-001, NATIONAL WATER QUALITY INVENTORY: REPORT TO CONGRESS FOR THE 2004 REPORTING CYCLE 18–19 (2009)).

[7] Stephen Harden, Characterization of Surface-Water Quality Associated with Swine CAFOs in Eastern North Carolina, Proposal submitted to the N.C. DEP'T OF ENV'T AND NATURAL RES., DIV. OF WATER QUALITY 1, 3 (May 9, 2011) (citing the EPA's 2002 National Water Quality Inventory).

more confined poultry with liquid waste handling. N.C. Gen. Stat. § 143-215.10B. Thus, any Feedlot with more than 250 swine is an Animal Operation subject to the Commission's regulatory authority as related to its handling of Animal Waste. The Commission has the regulatory authority and a duty to act to reduce the impact of livestock manure on the LCFR through its regulation of Animal Operations and Animal Waste. This must also be done through a TMDL in order to correct low DO in the Lower Cape Fear River.

B. Prior to 1999, the LCFR Experienced Explosive Growth in Animal Operations

The LCFR was not listed as impaired until large numbers of Animal Operations had been built in the basin. North Carolina in general, and the Cape Fear River basin in particular, experienced dramatic increases in the number and size of Animal Operations from the mid-1980s through the late-1990s. During that time, the swine population in the counties in the basin increased fourfold, turkey production doubled, chickens increased by 50%, and beef cattle by 25%. According to a study by scientists from the University of North Carolina at Wilmington, the Cape Fear River basin houses more than half the hog population in North Carolina.[8] The surplus nutrients are excreted in the livestock manure, which in turn feeds nutrients into the Cape Fear River through its tributaries.

The situation in the basin is so severe that analysts with the USDA's Natural Resources Conservation Service ("NRCS") found that the Cape Fear River basin and surrounding land area was the number one priority watershed in the United States based on its vulnerability to livestock manure nutrient pollution.[9] This finding is consistent with an earlier NRCS review as well.[10]

The proliferation of CAFOs in the Cape Fear River watershed is the best explanation for the low DO levels in the lower portion of the river, and this explanation is supported by the science. Research from the University of North Carolina at Wilmington shows that ammonium levels have increased in the river since the mid-1990s.[11] Ammonium is a form of nitrogen in swine and poultry waste that can be transported via runoff, subsoil movement, and volatilization and deposition.[12] This ammonium can be transported downstream to the section of the LCFR at issue here, where it can cause algal

[8] See "Nitrogen and Phosphorus Imports to the Cape Fear and Neuse River Basins to Support Intensive Livestock Production" by Lawrence B. Cahoon, Jill A. Mikucki, and Michael A. Mallin Environ. Sci. Technol., 1999, 33 (3), pp 410–415.

[9] See "Potential Priority Watersheds for Protection from Manure Nutrients" by Robert Kellogg, available online at: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_012227.pdf (Accessed Feb, 17, 2015)

[10] See "Manure Nutrients Relative to the Capacity of Cropland and Pastureland to Assimilate Nutrients: Spatial and Temporal Trends for the United States" by Robert Kellogg et al., available online at: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_012133.pdf (Accessed Feb. 17, 2015)

[11] Michael A. Mallin & Lawrence B. Cahoon, *Industrialized Animal Production—A Major Source of Nutrient and Microbial Pollution to Aquatic Ecosystems*, 24 POPULATION & ENVT. 369, 376 (2003) (internal citations omitted).

[12] *Id.*

blooms.[13] These algal blooms eventually die, and feed bacteria, generating a high biological oxygen demand (BOD), which in turn causes low DO.[14]

The single major land use change that could account for this increase in ammonia concentrations (and drop in DO) is the rapid growth of CAFOs during the 1980s and 1990s.[15, 16] This research reinforces the NRCS's finding that this area should be a priority watershed for protecting against nutrients from livestock manure.Trends showed a significant importation of these nutrients to the Cape Fear River basin from feed grown outside the basin.[17] (Early studies by UNC-W's Center for Marine Science also found a correlation between fecal coliform indicators and biological oxygen demand in the River.)[18] The Cape Fear River Basinwide Assessment Report of 1996 went even further, finding in 1995 that nitrogen and phosphorous from livestock manure exceeded the assimilative capacity of cropland by more than 400% in several counties within the watershed.[19] This troubling data caused DENR's analysts to state:

> "It should be noted that these figures do not take into account commercial fertilizer applications in the counties. It is clear based on this information, that animal waste management in a number of counties in the basin is becoming a critical issue, and that the animal carrying capacity of these lands (from a waste disposal standpoint) needs to be closely examined. Alternatives to cropland application need to be considered in these counties such as application on forest land or transportation/distribution of the collectable manure to counties that have capacity and could use this nutrient source in lieu of commercial fertilizers." [20]

Nutrients imported to the basin in the form of grain to feed the swine create a nutrient imbalance that this Commission must address.

Of course, since 1995, the numbers of swine, turkeys, layers and cattle have only increased in the Cape Fear River Basin. Their numbers are not a naturally occurring condition and their manure is not a naturally occurring pollutant. The record shows the DO violations are caused by animal feeding operations and other upstream sources, and not by naturally occurring conditions. Accordingly, the Commission must reject the proposed reclassification, and instead take measures to control pollution from animal

[13] *Id.* at 378, and Figure 2.
[14] *Id.*
[15] *Id.*
[16] We are not suggesting that CAFOs are the only source of the DO problem, but the state has the obligation to control the contributions of CAFOs rather than move forward with the reclassification.
[17] See "Nitrogen and Phosphorus Imports to the Cape Fear and Neuse River Basins to Support Intensive Livestock Production" by Lawrence B. Cahoon, Jill A. Mikucki, and Michael A. Mallin Environ. Sci. Technol., 1999, 33 (3), pp 410–415..
[18] See "Environmental Assessment of the Lower Cape Fear River System: 2002-2003" by Michael Mallin et al. CMS Report 03-03 (2003).
[19] See "Cape Fear River Basinwide Water Quality Plan" by NC DENR (1996). Available online at: http://portal.ncdenr.org/web/wq/ps/bpu/basin/capefear/1996 (Accessed Feb. 17, 2015)
[20] Id. at 3-17 through 3-19 and referenced figure.

waste at animal feeding operations and other upstream sources in order to restore water quality.

IV. The Technical Memoranda Do Not Carry the Burden of Proof on Naturally-Occurring Pollutant or Condition Causing the LCFR Impairments

The proponent for reclassification argues that natural conditions result in levels of DO and pH that excuse the violations of water quality standards and offers four Technical Memoranda ("TM") as factual support for the proposal. These TM are grossly deficient and misleading, and they omit significant information. While water quality in the Cape Fear River is influenced by the conditions found in the swamp and estuarine areas, low DO accompanied by high copper levels can be explained only by the contribution of animal waste and other upstream sources.

A. Experts Have Shown the Correlation Between Animal Operations and Eutrophication in the Lower Cape Fear

Dr. Joann Burkholder directs the Center for Applied Aquatic Ecology at North Carolina State University. An internationally recognized expert in her field, Dr. Burkholder has studied and published articles in peer-reviewed journals on topics directly relevant to assessing the causes of impairment in the LCFR: chronic effects of nutrient over-enrichment and other chemical environmental contaminants on aquatic plants; the impacts of cyanobacteria, dinoflagellates, haptophytes, and raphidophytes on aquatic ecosystems; and influences of long-term changes in watershed land use and pollution sources on surface water quality.

Dr. Burkholder reviewed the proposed reclassification, surveyed past literature and research and provided comments regarding the TM and the merits of the proposal itself. These comments, which constitute expert opinion, show that Animal Waste, Animal Operations and CAFOs are the primary cause of impairments for DO, pH, copper and turbidity. A copy of Dr. Burkholder's review is attached to these Comments and is incorporated by reference.

Dr. Burkholder notes that CAFOs are also point sources, and that they should be treated as such in the modelling, but were not evaluated this way. Even though CAFOs in the LCFR are the most concentrated per unit surface area in the entire nation, they are not addressed in the TM. Further, even though supporting data and research showing their contribution to low DO was readily available from peer-reviewed literature, they were not mentioned, evaluated or considered. The TM did not use the best science available, but rather singled-out the information which supported the proposal. The weight of science contradicts the TM and this Commission should reject the Proposal. The applicants have failed to meet their burden of proof to support a reclassification.

B. Impairment for Copper in the LCFR and the TMDL Trigger for those Impairments Also Point to Animal Waste as the Cause

The TM selectively present information to support the proposed reclassification, but the record of research in the Cape Fear Basin demonstrates that manure nutrients from Animal Waste are both contributing to the DO deficit and are subject to the Commission's control. Copper is recommended to be added to animal feeds to promote growth.[21] Professors working at North Carolina State University studied the composition of Animal Waste using samples and the statistics on statewide inventories of livestock animals.[22] In this study, Dr. Barker and Dr. Zublena totaled all the nutrients found in all of the Animal Waste in all of North Carolina's Animal Operations as they existed in 1993. Their published findings show that more than 290 tons of copper per year were present in the Animal Waste produced by North Carolina's Animal Operations. Subsequent studies showed that nitrogen concentrations had slightly declined between 1995 and 2005, but that copper and zinc values have remained steady, with the highest concentration found in liquid animal waste produced at dairies and swine operations, followed by litters produced at broiler and turkey operations.[23] [24] In 2012, North Carolina reported more than 300 miles of streams as impaired for copper on the CWA 303(d) list. The LCFR is part of those stream miles, from just outside Navassa into the area covered by the proposal. A TMDL is needed to address the impairment caused by excess copper.

Neither swamps nor estuaries contribute copper as a naturally occurring pollutant, whereas the scientific literature shows that copper is supplemented in feed to livestock and that hundreds of tons of it are excreted in Animal Waste produced by Animal Operations. Copper impairment on the Cape Fear River is thus a red flag, a fact that the four TM conveniently omit. Coupled with the impairments for low pH and turbidity, and the TMDL previously identified as needed for the LCFR, all signs point to Animal Waste as a primary cause. (The only exception is mercury impairment). Despite this evidence, the four TM omit any information about the contribution of Animal Waste to impairment; to the extent they insist that DO problems in the LCFR are caused by "natural conditions," they are misusing that term.

[21] See "Swine Feeding Suggestions" by Clemson University Extension, Circular 505 (1995), available online at: http://www.clemson.edu/psapublishing/pages/ADVS/EC509.PDF (last accessed Feb. 26, 2015)
[22] See "Livestock Manure Nutrients in North Carolina" by Dr. J.C. Barker and J.P. Zublena (1996), available online at: http://www.bae.ncsu.edu/programs/extension/evans/assess.html (last accessed Feb. 26, 2015)
[23] See "North Carolina Trends in Animal Waste Nutrient Concentrations" by Casteel, S., B. Cleveland, D. Osmond, and C. Hudak-Wise. 2007. In Proc. Soil Science Society of America Natl. Conf. – New Orleans, LA.
[24] Researchers and policymakers for the European Commission looking at allowable concentrations of copper supplements in livestock feed found that copper had negligible benefits to animal health except for piglets and recommended research to evaluate environmental impacts of copper excreted in livestock manure.See "Opinion of the Scientific Committee for Animal Nutrition on the use of copper in feedingstuffs" by the European Commission's Health and Consumer Protection's Directorate-General (2003) available online at: http://ec.europa.eu/food/fs/sc/scan/out115_en.pdf (last accessed Feb. 26, 2015)

C. A Proper Interpretation of the Bowen Model Supports the Use of TMDL to Reduce Loading to the LCFR from sources in the Cape Fear River, Black River and Northeast Cape Fear, Including Animal Operations

The modeling effort for predicting how decreasing loading of pollution to the LCFR would impact DO levels was conducted by Dr. Jim Bowen at UNC- Charlotte (Bowen Model).[25] The Bowen Model ran several scenarios that incorporated assumptions obscuring the impacts of loadings from Animal Operations, including CAFOs. Pollution from Animal Operations, including CAFOs, was treated as given input to the modelling. The Bowen Model lumped together all upstream sources, both natural and anthropogenic, in waste load figures from the three major rivers upstream of the LCFR. Thus, the pollutant load from all sources discharging pollutants into the Northeast Cape Fear River above the LCFR model segment were lumped together into a single pollutant source. This single pollutant load is a combination of types of sources. In developing the load allocations for a TMDL, each of the upstream rivers should be evaluated further to document the contribution from each type of source, including naturally occurring conditions, whether classified as non-point or point sources. There are several NPDES-permitted facilities, including CAFOs, upstream of the LCFRP.[26] Just because the Bowen Model lumps these loads into input categories labeled by the name of their original subbasin, the supporters of the reclassification lumps together with all other upstream sources as "natural." These permitted facilities are obviously not natural sources and should be addressed by the state through the TMDL process.

In the case of the Northeast Cape Fear River, the Bowen Model labeled the upstream pollutant load under the category upstream river source number 20. Likewise the Cape Fear River and Black River were treated as source numbers 18 and 19, respectively. (See Bowen Model, Table 9, p. 47) Based on this assumption, no attempt was made to identify the sources of loadings to the Northeast Cape Fear River, Cape Fear River or the Black River. The model did not consider how much of the loads from these upstream rivers came from naturally-occurring pollutants and how much came from NPDES-permitted discharges or from Animal Waste. Thus, the Bowen Model cannot be used to support any determination that conditions are the result of naturally-occurring pollutants because it lumped the naturally-occurring and anthropogenic pollutants together in each of the three major rivers that flow into the LCFR.

[25] See: "Development and Use of a Three-Dimensional Water Quality Model to Predict Dissolved Oxygen Concentrations in the Lower Cape Fear River Estuary, North Carolina available online at: http://webpages.uncc.edu/~jdbowen/LCFR/LCFR_DOModelReport_Final.pdf
(last accessed Feb. 26, 2015)

[26] For example, the following permits appear as NPDES permitted facilities run in connection with livestock operations upstream of LCFR: Godwin Farms Permit no. NCA282225; Dixie Chops, Inc. Permit No. NCA282143; Timothy Smith Farm Permit No. NCA231656; and Troy Sloan Farm Permit No. NCA231655. In addition, the Smithfield Packing Company holds Permit No. NC0078344 allowing up to 3 million gallons per day of water contaminated with pollutants such as those responsible for causing the types of impairments observed in LCFR. In addition, hundreds of Animal Operations in the basin operate under state level permits for handling animal waste. These sources are not naturally occurring and the Bowen Model does not make them such based on its inputs labelling scheme.

The Bowen Model also treated the estuarine tributaries in the same fashion as the three major rivers. Therefore, the Bowen Model cannot be used to support any determination that conditions there are the result of naturally-occurring pollutants because it lumped the naturally-occurring and anthropogenic pollutants together for these tributaries. A total of 20 wastewater treatment plants (WWTPs) with NPDES permits were also evaluated. The Bowen Model concluded that reducing loadings from these 20 WWTPs would not correct DO impairment, although they did have an effect on the amount of DO impairment. The Bowen Model can be interpreted to say that reduced loadings from these 20 WWTPs will not correct DO in the LCFR, but stretching the Bowen Model to prove that the LCFR are swamp waters is unsupported scientifically and is a misreading of the Bowen Model.

Significantly, the Bowen Model did conclude that reducing the combined loading from the Northeast Cape Fear River, Cape Fear River, the Black River and the estuarine tributaries would produce significant DO improvement. This Scenario was dubbed the "Clean River" Scenario. The Report states:

> "The load reductions of riverine, creek, and wetland inputs were found to have a significant impact on the estimated dissolved oxygen concentrations during the summer months in the impaired region of the Lower Cape Fear River Estuary. At the 10th percentile level, DO concentrations for the three load reduction scenarios increased by 0.2, 0.3, and 0.4 mg/L respectively, from 4.3 mg/l to either 4.5, 4.6, or 4.7 mg/L (Figure 80). Unlike the scenarios described in the previous section in which wastewater loading decreases were investigated, the level of increase in DO concentration was maintained at the higher percentiles when reductions in the river, creek, and wetland loadings were made. In fact, for this "clean river" scenario, the median DO concentration increased to even a greater extent than the 10th percentile value, increasing from 5.6 to 5.85 mg/L for the 30% reduction (an increase of 0.25 mg/L), and from 5.6 to 6.2 mg/L (an increase of 0.6 mg/L) for the 70% reduction scenario (Figure 80)." See Bowen Model at page 142, Scenario 6-3.

The Bowen Model then concluded that cleaning up the riverine and estuarine tributaries was still not enough to meet the DO standard. But that was not the end of the modelling efforts. The Bowen team recognized that lowering the inputs from the Black River, Cape Fear River and Northeast Cape Fear River would reduce accumulation of organic materials in the sediments and thus would also reduce Sediment Oxygen Demand (SOD). In most of the model runs, the Bowen Model had held SOD contribution as constant and as uniform. Dr. Burkholder rightly critiques this assumption as a flaw in the model.

To test whether reducing both loadings from SOD and from the Black River, Cape Fear River and Northeast Cape Fear River would meet DO standards, they ran

another scenario, dubbed a "Clean River Scenario." They found that by reducing the loadings from both SOD and upstream riverine and estuarine sources, 99% of the values achieved compliance with the DO standard. As the Bowen Model report noted:

> "In this scenario we examine what conditions would be necessary to produce summertime DO concentrations above 5.0 mg/L. In addition, one limitation of the analysis done previously is that it ignores possible changes that might occur in the benthos if organic matter loadings were reduced. For instance, it is likely that a reduction of 30% or 50% or 70% in organic matter loading would in the long-term also result in lower sediment oxygen demands. The cumulative effect of decreasing both organic matter loading and sediment oxygen demand are examined in this scenario." See Bowen Model at page 146, Scenario 6-5.

The Bowen Model thus shows that a TMDL would work and the designated uses can be protected. These model runs demonstrated that a reduction in the loadings from the Cape Fear River, the Black River and the Northeast Cape Fear River, and the Estuarine Tributaries would reduce loading to SOD. Taken together, this approach would correct DO and achieve compliance. Under the Clean Rivers scenario, DO would exceed the standard 99% of the time. Dr. Bowen's team writes:

> "The 50% reduction case had an even lower rate of water quality violations, but these were not completely eliminated. With both SOD and oxygen demanding wastes decreased, approximately 7% of summertime DO concentrations in the impaired region are below 5.0 mg/L, as compared to 27% when only the oxygen demanding wastes are decreased (Figure 82). There is also a large increase in the minimum predicted DO concentration for this case. The base case had a minimum predicted DO concentration of approximately 3.2 mg/L, whereas the minimum when SOD and oxygen demanding wastes are reduced by 50% is approximately 4.6 mg/L (Figure 82). A decrease in SOD of 70% and a reduction in river load of 70%, however, does almost completely eliminate dissolved oxygen concentrations below 5.0 mg/L (Figure 82). For this case, only about 1% of the predicted dissolved oxygen concentrations are below the water quality standard value." See Bowen Model at page 142, Scenario 6-5.

The TM erred in their use of the Bowen Model by treating the Cape Fear River, Black River and Northeast Cape Fear River inputs as naturally-occurring conditions. This faulty position fails to acknowledge that each of these rivers receive large loadings from pollutant sources – mainly Animal Operations and CAFOs themselves. Once you unpack the assumptions built into the Bowen Model, you see that it actually supports a TMDL effort to reduce the loading impact from the Cape Fear River, Black River and Northeast Cape Fear River to correct the low DO in the LCFR. Loading from Animal Operations, including CAFOs, in these three tributary rivers clearly have caused an increase in LCFR DO concentrations.

D. The TM Are Incorrect in Ascribing Large Loading of Pollution to the LCFR from Riparian Wetlands

Dr. Burkholder further noted that the data do not support the assertion that inputs from riparian wetlands are "significant contributors to the tremendous loads of oxygen-demanding materials." While the Bowen Model treated loadings from the three major rivers and the estuarine tributaries as if they were discharges from giant WWTPs, the Bowen Model does not attempt to distinguish between the pollutant loading caused by anthropogenic activities and those from naturally-occurring pollutants or conditions. Riparian wetlands often act to reduce the impact of pollutants to surface waters.

Other experts have identified Animal Waste as especially significant for Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) from ammonia, in the Northeast Cape Fear River system (e.g., Mallin et al. 1997). Dr. Burkholder points out that TetraTech focused on the three largest NPDES permitted dischargers and showed that reducing loading from these sources would not correct the problem. Once again, this does not prove natural conditions. Rather, it proves that the problem can be corrected only by reducing the impact of Animal Waste and the loading coming to LCFR from the Cape Fear River, Black River and the North East Cape Fear River as supported by the Bowen Model.

Similarly, the TM authored by CH2M HILL contains a description of surface water quality conditions in summer that omits any discussion of the massive contribution of organic-rich, oxygen-demanding materials from Animal Waste. Dr. Burkholder's research, and that of her cited colleagues, shows that Animal Waste is a cause of the impairments currently found in the LCFR: copper, pH, turbidity and low DO. All available data show that past pollution must be dealt with if the Cape Fear River is to continue to serve its role as a public resource. In order to uphold its duty to the people of this State, the Commission and Department must deny the request.

V. Other Issues Prevent this Commission from Approving the Proposal as Submitted

Other problems with this proposal prevent the Commission from proceeding as proposed and require that the sidetracked TMDL proceed again to a conclusion. Even if a reclassification were an appropriate substitute for a TMDL in this case, two oversights would have to be corrected first: (1) the state failed to perform a Use Attainability Analysis (UAA) which could be approved only if the state can show that the current designated use is in fact unattainable; and (2) the fiscal assessment is grossly inadequate.

Under EPA regulations, the state must conduct a UAA if it is removing a designated use or adopting subcategories that impose less stringent water quality criteria. 40 CFR 131.10(j). The proposed reclassification would create a new subcategory for this waterbody, an action that plainly requires the completion of a UAA to demonstrate that attainment of the designated uses is not feasible. The state has not performed a UAA for

this section of the LCFR, so it has not met its obligations under EPA regulations. If the state elects to continue pursuing this reclassification, it must perform a UAA before submitting a reclassification proposal.

In addition, the state is required to prepare a fiscal note under the NC Administrative Procedures Act (APA). The current fiscal analysis claims that there will be no "quantifiable" impacts, positive or negative, of the proposal. No factual support or analysis is made for this claim. Where the extent and quantification of fiscal impacts is uncertain, the agency is forbidden from just assuming that there are none. "If an agency is not sure whether a proposed rule change would have a substantial economic impact, the agency shall ask the Office of State Budget and Management to determine whether the proposed rule change has a substantial economic impact. Failure to prepare or obtain approval of the fiscal note as required by this subsection shall be a basis for objection to the rule under G.S. 150B-21.9 (a)(4)." N.C. Gen. Stat. § 150B-21.4. The fiscal analysis provided for this proposal is plainly insufficient to meet APA requirements.

Here, we provide a few examples of the substantive inadequacies of the current fiscal analysis. First, there would be costs to the implementing agencies, as they would be required to apply the narrative swamp standards and determine whether violations were caused by natural conditions or dischargers. This would be time-intensive, and therefore costly, for the implementing agencies. Second, this proposal poses clear threats to the environment and ecosystem of the LCFR. These include negative impacts on the fish populations (and the fishing and recreation economies of the area) from the permission of decreased DO concentrations (from the reclassification that will potentially allow more lenient permits based on "natural" conditions and from the codification that will allow new permits to result in a 0.1mg/L drop in DO).

Third, the benefits associated with future planning are created by the codification component of the proposal, and entirely unrelated to the reclassification element of the proposal. Indeed, the reclassification might have the opposite effect because it will be difficult to anticipate how the state will apply the narrative standard for swamp waters. Fourth, there will plainly be economic benefits to dischargers who will have the option of dropping the DO concentration (based on the proposed codification) and the opportunity to argue that the natural conditions now being recognized also should have been considered at the time of their original permit issuance, making them eligible for an exception to the anti-backsliding policies (based on the reclassification). The economic analysis even admits that "[d]ischarges (sic) may in the future be granted additional wasteload allocations." Fifth, there is no discussion of the benefits to CAFOs, Animal Operations and Feedlots. CAFOs and Animal Operations may benefit by avoiding their federal and state obligations under NPDES or under a mandatory state TMDL program.

The Commission is not excused from its duties under the APA when impacts are difficult to quantify. It is simple to understand where the weight of the impacts resides -- doing nothing allows continued harm to the river and allows those who are polluting under the status quo to continue their behaviors. Without quantifying the impacts, it is clear that the reclassification part of the proposal is harming the local communities and

the environment, while it is benefiting the Animal Operations that are the original source of the problem. The reclassification is not economically justifiable and should be abandoned. In addition, the current document combines the fiscal analysis of the reclassification and codification components of the proposal. These should be analyzed separately, as they could be separated by the EMC, legislature, or RRC since neither one is necessary for the other. If the proposals are separated in the future, it will be important to understand if they are independently economically justifiable. The current analysis sheds no light on this issue.

VI. Starting a Conversation or Stopping it Cold

A representative from the LCFRP participated in the oral comment process and mentioned that this proposal was meant to "start the conversation" about problems on the LCFR. The actual proposal will not start a conversation, but end it. Once approved, this proposal will put an end to any discussions of the DO water quality of the LCFR. Once the existing NPDES permit holders are off-the-hook, we should expect new NPDES applicants to demand the same consideration and eliminate the management protections as the next step. In addition, low DO will continue to worsen as nutrient cycling creates a worse situation in the sediments. The current proposal is an illegal end-run around the TMDL process, which is squarely counter to the CWA's objectives and scheme. The end point of the CWA was never to surrender to water quality degradation, but to fight for clean water. Our law requires the Commission to reject this proposal.

Very Truly Yours,

/s/

Ryke Longest, Director
Duke Environmental Law and Policy Clinic

cc: EPA Region IV Administrator

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February 12, 2016

VIA ELECTRONIC MAIL
Elizabeth Kountis
DENR-DWR Planning Section
1611 Mail Service Center
Raleigh, NC 27699-1611
elizabeth.kountis@ncdenr.gov

Re: Cape Fear River Estuary Water Quality Management Plan

Dear Ms. Kountis:

The Southern Environmental Law Center appreciates the opportunity to comment on the proposed water quality management plan[1] for the Lower Cape Fear River ("LCFR")[2] on behalf of Cape Fear River Watch, Waterkeeper Alliance, and the North Carolina Conservation Network. Together, these organizations represent thousands of North Carolinians who drink, fish, swim, and paddle the state's rivers, including the Cape Fear; who place a high value on the quality of North Carolina's water resources; and who will be adversely affected by the degradation of water quality in the Cape Fear River. As such, these comments are intended to express concern regarding the agency's proposed management strategy for the LCFR.

As described in Section I, the strategy represents an abrupt and questionable departure from years of collaborative efforts to ensure that use of the river by aquatic life would be supported. In Section II, we document the myriad ways in which the water quality management plan under consideration appears intentionally designed to have minimal impact and therefore

[1] Although the agency specifically solicited comments regarding the proposed changes to the water quality management plan for the Lockwoods Folly River Area, those changes are not the only amendments to 15A N.C. Admin. Code 02B .0227 contemplated in the proposed rule published in the North Carolina Register on December 15, 2015. We therefore appreciate your consideration of our comments and their inclusion in the rulemaking record. See N.C. Gen. Stat. § 150B-21.2(f) ("An agency must accept comments on the text of a proposed rule that is published in the North Carolina Register and . . . consider fully any written and oral comments received"); *id.* § 150B-21.2(i) ("An agency must keep a record of a rule-making proceeding. The record must include all written comments received . . . .").

[2] As used herein, "LCFR" refers to the portion of the Cape Fear River from upstream of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut.

afford minimal protection to aquatic life. And, in Section III we emphasize the importance of preserving the designated use of the LCFR for aquatic life, which we believe should include efforts to protect endangered species that rely on the river.

I. Retreat Rather than Recovery: TMDL Avoidance in the LCFR

Every two years, the State must assess whether the designated uses[3] of a water body are supported by existing water quality.[4] Where existing pollution control requirements are insufficiently stringent to implement any water quality standard applicable to a water body, the State must take responsive action.[5] First, the water body must be included on the 303(d) list of impaired waters. Then, in order of established priority, the State must establish a total maximum daily load (TMDL) of the pollutant(s) impairing the designated use of listed waters; the TMDL should be calculated to limit pollutant loading to the degree necessary to attain applicable water quality standards.[6] Put more simply, after documenting unacceptable water quality, the State must take action to improve water quality to the degree necessary to support the water body's designated uses.

In Class SC waters like the LCFR, the normal dissolved oxygen standard is 5.0 mg/L.[7] In 1998, the State first observed that the designated uses of the Cape Fear estuary were impaired by low dissolved oxygen (DO) concentrations.[8] At the time, responsive measures were already

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[3] The classification of a water body dictates the applicable water quality standards necessary to protect the "best usage" of the waters with that classification. *See* N.C. Gen. Stat. 143-214.1(a)(1) (directing the EMC to develop "a series of classifications and the standards applicable to each such classification"); 15A N.C. Admin. Code 02B .0201 ("Existing uses . . . and the water quality to protect such uses shall be protected by properly classifying surface waters and having standards sufficient to protect these uses."); *see also* 40 C.F.R. § 131.11(a)(1) ("States must adopt those water quality criteria that protect the designated use. . . . For waters with multiple use designations, the criteria shall support the most sensitive use.").

[4] *See* 33 U.S.C. § 1315(b).

[5] 33 U.S.C. § 1313(d)(1)(A); 40 C.F.R. § 130.7(b). Conversely, where existing control strategies for point and nonpoint source pollution will achieve water quality standards, the law does not mandate such action.

[6] 33 U.S.C. § 1313(d)(1)(C); see also 40 C.F.R. § 130.7(c)(1) ("TMDLs shall be established at levels necessary to attain and maintain the applicable narrative and numerical [water quality standard] with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.").

[7] 15A N.C. Admin. Code 02B .0220(5).

[8] N.C. Dep't of Env't and Natural Res. (NC DENR), *North Carolina's 1998 303(d) List* T-6 (May 15, 1998) (noting that of the 7,500 acres providing only "partial support" of designated uses, 5,000 were impaired by DO and listing wastewater treatment plants as a source of the impairment.),

under consideration; the State opined that "[p]roper technical conditions exist to develop a TMDL for this water body/pollutant" and that TMDL development was the "[u]sual approach" for responding to DO impairment.[9] A TMDL for Biological Oxygen Demand (BOD) had already been drafted in 1996 that "proposed using a phased approach to reducing BOD loading to the lower Cape Fear and highlighted several options that primarily reduce point source discharges to the river."[10] However, that TMDL was never approved or implemented.

By 2000, the DO impairment had been elevated to a high priority for the agency, which, by then, was meeting with the "regulated community . . . on a regular basis to discuss the modeling approach and investigate funding sources for the TMDL addressing low dissolved oxygen."[11] In 2002, the agency again listed the Cape Fear estuary as a high-priority water body for which a TMDL was required due to low dissolved oxygen.[12] When no TMDL was developed, the water body was again included on the list of impaired waters in 2004.[13]

In 2006, the LCFR was again listed as impaired due to low DO.[14] The State indicated that it expected to submit a TMDL to address this impairment "by the beginning of calendar year 2008."[15] Notably, by this time, the use of the LCFR had also become impaired by low pH.[16] However, the State remained focused on addressing what was nearly a decade-old DO impairment.

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http://portal.ncdenr.org/c/document_library/get_file?uuid=2284d944-2134-4c57-a2d9-499c58076d4a&groupId=38364.

[9] *Id*.

[10] *Id.* at 13 (noting the drafting of a BOD TMDL of 80,000 lbs/day BOD_u for the lower Cape Fear River below Lock and Dam #1).

[11] NC DENR, *North Carolina's 2000 303(d) List* 6 (Oct. 2, 2000), http://portal.ncdenr.org/c/document_library/get_file?uuid=20e877f9-81c3-4536-9622-e605646fcde4&groupId=38364.

[12] NC DENR, *North Carolina 2002 Impaired Waters List* 4 (Feb. 13, 2003), *http://portal.ncdenr.org/c/document_library/get_file?uuid=7cfe0f8a-bde3-4523-9e3e-cdc44e323123&groupId=38364*.

[13] NC DENR, *North Carolina 2002 303(d) Impaired Waters List-2004* 2 (Apr. 26, 2004), *available at http://portal.ncdenr.org/c/document_library/get_file?uuid=1504027b-a8d8-4c2d-83d5-0b1ac5cec792&groupId=38364.*

[14] For the 2006 listing, the State first assigned the "assessment units" currently used to define the LCFRE as the portion of the river from upstream of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut.

[15] NC DENR, North Carolina Water Quality Assessment and Impaired Waters List (2006 Integrated 305(b) and 303(d) Report) 54 (May 17, 2007).

[16] NC DENR, *North Carolina 303(d) List- 2006* 19 (June 19, 2007), http://portal.ncdenr.org/c/document_library/get_file?uuid=2648fa39-0975-4b27-8181-b0927ec2a43d&groupId=38364.

In October 2008, DENR staff considered five "Options for Addressing Dissolved Oxygen in the Lower Cape Fear River."[17] One of the options considered was "reclassification" but agency staff observed "[r]eclassifying the water does not appear to be an option at this time because no current NC classification 'fits' better than the water's existing SC designation. For example, Swamp waters have low velocities. The Cape Fear estuary is tidal and well mixed, not low-velocity."[18] Staff noted that "[a] TMDL with a target of 5.0 mg DO/l is doable, but most likely could not be successfully implemented." Ultimately, staff concluded that "[a] site-specific standard might be appropriate in this case" and noted "[i]f the dischargers in the watershed request a site-specific standard, DWR would support and oversee their development of the scientific rationale to derive it."[19] At that point, rather than seek to *attain* existing water quality standards, the agency and regulated community began considering strategies to *change* the water quality standards.

The DO impairment persisted and water quality in the LCFR worsened while the agency continued to study the problem.[20] Although claiming that TMDL development was a high priority in 2008,[21] 2010,[22] and 2012,[23] the agency continued to evaluate how to avoid implementing a TMDL. In November 2012, DWQ met with stakeholders to consider a technical assessment of natural and anthropogenic sources of dissolved oxygen deficit in the Lower Cape Fear Estuary.[24] It was suggested that Kathy Stecker, a DENR staff member, lead the combined effort. Ms. Stecker indicated that "determining a rationale for site specific criteria was likely the

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[17] E-mail from Kathy Stecker, NC DENR, to Elizabeth Kountis, NC DENR (May 16, 2014) (noting the options were prepared for a discussion with Coleen Sullins, then-Director of the Division of Water Quality).
[18] *Id*. Other rejected options included conducting a use attainability analysis or authorizing a temporary variance from water quality standards. *Id.*
[19] *Id.*
[20] By 2008, the LCFR was impaired by violations of standards for DO, pH, nickel, copper, and turbidity. NC DENR), *2008 North Carolina Integrated Report Categories 4 and 5 (Impaired Waters List)* 14 (March 10, 2010), http://portal.ncdenr.org/c/document_library/get_file?uuid=9f453bf9-2053-4329-b943-6614bd4e709a&groupId=38364.
[21] *Id.*
[22] NC DENR, *NC 2010 Integrated Report Categories 4 and 5 Impaired Waters* 16 (Aug. 31, 2010), http://portal.ncdenr.org/c/document_library/get_file?uuid=8ff0bb29-62c2-4b33-810c-2eee5afa75e9&groupId=38364. By 2010, the use of the LCFR was no longer impaired by violations of the water quality standard for nickel.
[23] NC DENR, *2012 North Carolina 303(d) Lists- Category 5* 20 (Aug. 10, 2012), http://portal.ncdenr.org/c/document_library/get_file?uuid=9d45b3b4-d066-4619-82e6-ea8ea0e01930&groupId=38364.
[24] CH2M Hill, Meeting Summary, Technical Assessment of Natural and Anthropogenic Sources of Dissolved Oxygen Deficit in the Lower Cape Fear Estuary (Nov. 7, 2012).

most feasible approach" and would be beneficial because it would "support aquatic life, allow for effective permitting, and provide acceptable limits for dischargers."[25] The agency and regulated community continued to evaluate this approach until early 2014.

In January 2014, the Chairman of the Water Quality Committee of the North Carolina Environmental Management Commission reviewed the list of impaired waters in North Carolina and opined to DWR staff that it "may be worth taking a look" at "streams that are not classified as Swamp Waters but probably should be."[26] He expressed concern that "if you do not have the classification correct then you could call a stream impaired when it is really not and could require much more [wastewater] treatment for a discharger than may be necessary."[27] In response, Ms. Stecker noted that reclassification was not necessary to account for naturally low DO and pH.[28] According to Ms. Stecker, the agency accounted for naturally low DO or pH in other ways when preparing the 303(d) list; she observed:

> Our solution doesn't involve rulemaking. The standards include an "out" for natural conditions, and we have developed a protocol that EPA concurs with. . . . We have successfully de-listed waters with naturally low DO and/or pH, and we've found others that really are impaired and developed TMDLs for those. . . . [I]f we suspect naturally low DO or pH, we don't put it on the list, but in Category 3. Those that we're working on in Category 5 have been there for a long time.[29]

Surmising that the WQC Chairman was primarily concerned with protecting dischargers, another DWQ staff member responded,

> The natural waters determination doesn't always get the dischargers off the hook. For instance, in the lower Cape Fear it gets tricky because modeling shows that

[25] Id.
[26] E-mail from Steve Tedder, NC EMC, to Dianne Reid, NC DENR (Jan. 28, 2014).
[27] *Id.*; 15A N.C. Admin. Code 02B .0220(5), (12) (permitting lower pH and DO standards for Class SC waters with the supplemental "swamp waters" classification).
[28] E-mail from Kathy Stecker, NC DENR, to Dianne Reid, NC DENR (Jan. 28, 2014) (responding to Tedder's suggestion); *see also* 15A N.C. Admin. Code 02B .0205 (stating that "natural waters may on occasion, or temporarily, have characteristics outside of the normal range established by the standards" and "water quality standards will not be considered violated when values outside the normal range are caused by natural conditions).
[29] *Id*.

> even if we treat it like swamp water, the combined discharges still lower the DO too much and need to be further reduced.[30]

It is unclear whether the WQC Chairman nonetheless suggested the reclassification approach to the members of the Lower Cape Fear River Program (i.e., the members of the regulated community with which the agency had been working for years to address the DO impairment in the LCFR). However, before the next meeting of the WQC, that group submitted a request for reclassification of the LCFR as "swamp waters."[31]

In response, the agency ultimately proposed reclassification of the LCFR as "swamp waters." In tandem with this reclassification, the agency proposed the water quality management plan under consideration. In the following sections, we address concerns regarding this management plan.

II. Intentional Ineffectiveness: Crafting a Plan to Minimize Required Action

Perhaps the most obvious problem with the proposed management plan is its intentionally limited effect. Ordinarily, water quality management plans are adopted "to attain, maintain or enhance water quality" and should include "specific actions deemed necessary . . . to protect the water quality or the existing uses."[32] Yet the agency concedes that the management plan for the LCFR is *not intended to improve water quality*.[33] Nor is it truly intended to *maintain* water quality: it starts from the premise, derived from the reclassification, that it is acceptable for standards for pH and DO in the river to be lowered. Instead, the plan was crafted to have the minimum impact on the regulated community, and hence the least benefit to water quality. So successful was the agency in this regard that it concedes the management plan will have no effect whatsoever on the status quo. [34]

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[30] E-mail from Dianne Reid, NC DENR, to Steve Tedder, NC EMC (Jan. 28, 2014).
[31] Chris May, Request for Reclassification of a Portion of the Lower Cape Fear River with the Supplemental Swamp Classification (Mar. 5, 2014).
[32] 15A N.C. Admin. Code 02B .0227(a).
[33] "The proposal does not include language about correcting or reducing pollution as it is not designed to be a water quality restoration plan." NC DENR, *Report of Proceedings on the Proposed Reclassification of a Cape Fear River Segment, in Brunswick and New Hanover Counties (Broad River Basin) From SC to SC Sw with a Water Quality Management Plan* 10 (Feb. 5, 2015), http://portal.ncdenr.org/c/document_library/get_file?uuid=866ee647-ef8a-4912-8d36-06f26e6b1356&groupId=61581.
[34] *Id.* at 11 ("No changes to the current monitoring strategy as well as the current permitting and compliance strategies for the subject waters will occur due to this proposal.").

First, the plan makes no attempt to regulate nonpoint source pollution. Most notably, the plan does not address the contribution of pollutants from the Concentrated Animal Feeding Operations (CAFOs) in the Cape Fear River basin, which produce 50 percent of North Carolina's swine and large numbers of poultry.[35] The State should not disregard scientific analysis showing that, when waste management practices at CAFOs are poorly regulated, "large amounts of nitrogen and phosphorus enter the environment through runoff, percolation into groundwater, and volatilization of ammonia,"[36] and can exacerbate low DO (and pH) levels. Indeed, according to the EPA, hypoxia (i.e., low DO) "is regulated primarily by controlling nutrients (largely nitrogen) and other oxygen-demanding wastes."[37] North Carolina implicitly agreed with this observation by proposing a management plan focused exclusively on controlling BOD, DO, and ammonia from point sources. Yet, the proposed management plan imposes no limit on nonpoint source loading of nutrients or oxygen-demanding waste in the LCFR; nor does it address nutrient loading in upstream tributaries.

It is particularly ironic that the plan addresses only to point sources, and disregards nonpoint sources, since the supposed justification for reclassification of the river was that *point sources were not the cause* of observed violations of water quality standards.[38] Moreover, the agency intentionally excluded some point sources from the requirements proposed under the plan. Most obviously, the plan does not require any pollution reduction from existing facilities.[39] Initially, agency staff opined that "whatever goes into place for DO and pH may likely affect all discharges, whether new, expanding, renewals, etc."[40] However, the plan was revised to exclude existing facilities when research revealed the inability of existing facilities to comply with the

[35] Michael A. Mallin & Lawrence B. Cahoon, Industrialized Animal Production—A Major Source of Nutrient and Microbial Pollution to Aquatic Ecosystems, 24 Population and Environment 369, 369 (2003).
[36] *Id.* at 379.
[37] U.S. EPA, *Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras*, at v (Nov. 2000), http://water.epa.gov/scitech/swguidance/standards/upload/2007_03_01_criteria_dissolved_docriteria.pdf.
[38] Chris May, Request for Reclassification of a Portion of the Lower Cape Fear River with the Supplemental Swamp Classification (Mar. 5, 2014).
[39] E-mail from Tom Belnick NC DENR, to Elizabeth Kountis, NC DENR (April 16, 2014) ("I don't anticipate any changes to current NPDES permit limits."); e-mail from Ken Pickle, NC DENR, to Elizabeth Kountis, NC DENR (Apr. 17, 2014) ("I don't think any of our permittees (stormwater permittees, or wastewater dischargers under a permit administered by the Stormwater Permitting Program of DEMLR) would be impacted by the re-classification.").
[40] E-mail from Elizabeth Kountis, NC DENR, to Jim Gregson, NC DENR (May 19, 2014).

first draft of the plan.[41] Also, before proposing a plan applicable to only new or expanding facilities, the agency confirmed that there were no pending applications for new or expanded facilities[42] and that the existing facilities anticipating expansion already had permission to expand.[43]

The scope of the management plan was further curtailed when concern was expressed that the plan might apply to facilities authorized to discharge under general permits. Although early drafts proposed to manage *all* new or existing NPDES discharges, the plan was modified to reference only "individual" permits. Yet, even after drastically limiting its applicability, the agency was not finished reducing the plan's impact of the plan on the status quo.

The agency concedes that, because the LCFR is designated as a Primary Nursery Area, it is entitled to additional protection due to its important role in supporting aquatic life.[44] However, although the agency claims the management plan sets limits "similar to the limits for High Quality Waters,"[45] in truth the plan affords less protection.

Ordinarily, new or expanded wastewater discharges into high-quality waters must comply with the following limitations designed to control the discharge of oxygen-consuming waste:

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[41] *See* e-mail from Jim Gregson, NC DENR, to Elizabeth Kountis, NC DENR (May 21, 2014) ("Of the eight existing facilities, the three domestic plants currently have BOD or CBOD limits of 30 and 25, respectively. . . . None of the three Domestic plants would likely be able to meet a BOD limit of 5 mg/L without significant upgrades including filters. Two of the three domestic plants currently do not have Ammonia limits. The one that does (NC0065480) has a monthly ave. limit of 20 mg/l and a daily max. of 35. . . . I don't think any of the three domestic plants could currently meet an Ammonia limit of 1 mg/l."); *see also* e-mail from Bill Kreutzberger, CH2M, to Jeff Manning, NC DENR (June 5, 2014) ("The problem with the statement is that the current cumulative permitted discharge[s] case a decline of 0.2 to 0.3 mg/L below natural conditions. So the reference needs to be that the increase in loading from *new or expanding dischargers* can cause no more than a 0.1 mg/L decline in DO." (emphasis added)).

[42] "I understand that there are no proposed discharge permits for new facilities or expansion of existing facilities that your office is currently working on for this segment." E-mail from Elizabeth Kountis, NC DENR, to Jim Gregson, NC DENR (May 19, 2014); *see also* e-mail from Elizabeth Kountis, NC DENR, to Tom Belnick, NC DENR (July 10, 2014).

[43] "Currently there are 4 NPDES-permitted dischargers that discharge oxygen-consuming waste to the proposed SW reclass segment. Of these facilities, 3 have already received phased permit limits for future expansions." E-mail from Tom Belnick, NC DENR, to Jeff Manning, NC DENR (June 16, 2014).

[44] NC DENR, Report of Proceedings on the Proposed Reclassification of a Cape Fear River Segment, in Brunswick and New Hanover Counties (Broad River Basin) From SC to SC Sw with a Water Quality Management Plan a 3; see also 15A N.C. Admin. Code 02B .0101(e)(5).

[45] NC DENR, Report of Proceedings on the Proposed Reclassification of a Cape Fear River Segment, in Brunswick and New Hanover Counties (Broad River Basin) From SC to SC Sw with a Water Quality Management Plan a 3.

> Effluent limitations shall be as follows: BOD5= 5 mg/l, NH3-N = 2 mg/l and DO = 6 mg/l. More stringent limitations shall be set, if necessary, to ensure that the cumulative pollutant discharge of oxygen-consuming wastes shall not cause the DO of the receiving water to drop more than 0.5 mg/l below background levels, and in no case below the standard.[46]

However, the management plan for the LCFR was designed to impose less stringent limits on oxygen-consuming waste. First, because industrial dischargers may not be able to meet the normal BOD and NH3-N limits for HQW waters, an additional provision was added to exempt them from such limits.[47] Even more concerning is the plan's failure to consider background levels and/or the actual water quality standards applicable to the river.

Here, the evolution of the relevant language bears emphasis. As initially drafted, the water quality management plan for the LCFR was designed to prevent a drop in DO "below the standard." Then the language was amended to prohibit a drop below the "natural conditions." A subsequent draft prohibited a drop below the "modeled natural conditions." And, finally, the proposed language eschews any reference to the standards or natural conditions and instead uses "modeled in-stream dissolved oxygen at total permitted capacity for all discharges" as the baseline against which to measure the effect of a proposed permit.[48]

In other words, instead of considering actual standards and real data, the agency proposes to evaluate the impact of permitted activity based solely on modeling; this approach will have concerning effects on both permitting decisions and future assessments of use impairments. This novel approach appears to be a result of the agency's continued inability (despite a decade of trying) to determine the natural background levels of DO in the segment.[49] Indeed, e-mails

[46] 15A N.C. Admin. Code 02B .0224(b)(i).
[47] E-mail from Tom Belnick, NC DENR, to Elizabeth Kountis, NC DENR (Aug. 3, 2015) ("The site-specific BAT language for industrials goes back to at least the 2000 Cape Fear River Basin Plan, where it was recognized that industries might not be able to achieve BOD= 5 mg/l and NH3-N = 2 mg/l.").
[48] Notably, the plan does not require consideration of the lower pH that could result from these discharges.
[49] The reluctance to rely on data to identify a change in DO of 0.1 mg/L might also result from the margin of error currently allowed for reporting DO results in laboratory tests. DO results must be reported to the nearest 0.1 mg/L with an accuracy of +/- 0.5 mg/L. North Carolina Wastewater/Groundwater Laboratory Certification Approved Procedure for the Analysis of Dissolved Oxygen (DO) (Apr. 2013).

exchanged within the agency noted the agency's inability to identify background conditions[50] and stated "using the model would be a totally different thing."[51]

Even worse, the agency fails to clarify in the management plan any quality assurance requirements for the modeling in question. Language was specifically omitted from early drafts that would have required modeling results to be "demonstrated," that would have required a person to "obtain Division of Water Resources review and approval of any monitoring study plan and description of the modeling framework to be used prior to commencement of such a study," and that would have required the study plan and modeling framework to "meet any Division requirements for data quality and model support or design in place at that time."

Understandably, the EPA expressed reservations about the approach contemplated in the proposed water quality plan. One federal regulator noted:

> When other states have adopted a 0.1 mg/L type provision, it has been a provision that applies to all implementing programs and has been provided as an amount of change from background condition. And even then the background condition has to be specifically defined before the provision can be used to deviate from the natural condition.[52]

Still, for all the aforementioned problems with the contents of the plan, perhaps the most destructive is the failure to include specific protections for the use of the river by aquatic life. Again, early drafts considered such provisions, and the agency apparently considered establishing a threshold for DO below which the river would not be allowed to fall. Indeed, some drafts even included different DO thresholds designed to protect specific species, including striped bass and endangered sturgeon. Ultimately, however, none of these laudable attempts to protect the designated uses of the river was included in the final management plan.

In other words, after years of observing that low DO impaired the use of the LCFR by aquatic life, the agency now proposes to reclassify the river as swamp waters, removing any floor for DO, and refrain from establishing a new minimum DO standard through the associated

[50] E-mail from Cam McNutt, NC DENR, to Jeff Manning, NC DENR (June 4, 2014) ("We do not know what natural conditions DO level is so no assessment decision is made.").
[51] E-mail from Cam McNutt, NC DENR, to Jeff Manning, NC DENR (June 5, 2014) ("In the past we have not assess[ed] DO in Sw waters. Using the model would be a totally different thing.").
[52] E-mail from Lauren Petter, US EPA, to Elizabeth Kountis, NC DENR (Aug. 7, 2015).

management plan.[53] In the following section, we address the impropriety of ignoring protection of aquatic life in the LCFR.

III. Prioritizing Refuse over Use: Sacrificing Aquatic Life Protection to Satisfy Dischargers

The water quality standards associated with the "swamp waters" classification are designed to protect the use of waters for the propagation and survival of aquatic species that naturally occur in swamp waters.[54] Specifically, the EMC allows certain swamp waters to have higher acidity (i.e., low pH) and lower dissolved oxygen (DO) concentrations.[55] Class SC waters with the supplemental "swamp waters" classification "may have a pH as low as 4.3 if it is the result of natural conditions."[56] Though the agency has publicly disavowed plans to lower DO or pH standards, internal communications reveal that this is the anticipated effect,[57] or even primary motivation,[58] of the proposed action. A water quality management plan presupposing

[53] This issue was a particular concern of the US Fish and Wildlife Service. *See* letter from Tom Augspurger, USFWS, to Elizabeth Kountis, NC DENR (March 3, 2015) (expressing "concern that a Sw classification, allowing lower DO if caused by natural conditions, might make it more difficult to determine use support related to DO in the future without some mechanism to define a new lower bound on DO indicative of background conditions").

[54] In contrast, other supplemental classifications result in application of more stringent water quality standards. *See, e.g.,* 15A N.C. Admin. Code 02B .0211(4) (more stringent freshwater chlorophyll-a standards for nutrient-sensitive waters and trout waters); *id.* 02B.011(6) (more stringent DO standards for trout waters); *id.* 02B .0211(19) (toluene standard applicable only to trout waters); *id.* 02B .0211(21) (more stringent turbidity standard for trout waters); *id.* 02B .0220(3) (more stringent saltwater chlorophyll-a standards for nutrient sensitive waters and trout waters); *id.* 02B .0223 (requiring development of nutrient control strategies in nutrient sensitive waters); *id*. 02B .0224 (stating standards applicable to high-quality waters); *id.* 02B .0225 (stating standards for outstanding resource waters). The State's anti-degradation policy is also stricter for waters classified as high-quality waters or outstanding resource waters. *Id.* 02B .0201.

[55] 15A N.C. Admin. Code 02B .0211(6), (14) (permitting lower pH and DO standards for Class C waters with the supplemental "swamp waters" classification); 15A N.C. Admin. Code 02B .0220(5), (12) (permitting lower pH and DO standards for Class SC waters with the supplemental "swamp waters" classification).

[56] *Id.*

[57] *See e.g.,* e-mail from Elizabeth Kountis, NC DENR, to Jim Gregson, NC DENR (May 19, 2014) ("Please note that this reclassification will most likely result in something less strict than what is currently required for DO and pH, so those facilities having a difficult time reaching 5 mg/l and the acceptable pH levels now may get some relief."); e-mail from Elizabeth Kountis, NC DENR, to Tom Belnick, NC DENR (Apr. 17, 2014) ("My understanding is that a Sw reclass . . . would remove the DO and pH impairments for 18-(71)a.").

[58] E-mail from Elizabeth Kountis, NC DENR, to Jeff Manning, NC DENR (May 9, 2014) ("Kathy mentioned that an impairment couldn't be lifted via use of .0227 only, that there would need to be

reclassification of the LCFR as swamp waters should include measures to ensure that the permissive lowering of DO and pH standards will not impair use of the water for aquatic life propagation and survival.

Mindful of the potential for lowering DO limits, a number of scientists expressed concern about the effects that the agency's proposed reclassification and associated water quality management plan for the LCFR would have on aquatic life. DEQ's own Division of Marine Fisheries objected to the proposed action because of anticipated impacts on fish species.[59] A rather blunt assessment was offered by the National Oceanic and Atmospheric Association (NOAA): "Reclassifying the lower Cape Fear is a bad idea."[60]

For the most part, the concern centered around effects that the proposal would have on anadromous species. In late winter, species including striped bass, Atlantic sturgeon, and American shad migrate from the ocean and lower Cape Fear estuary to spawn upstream in the main stem of the Cape Fear River.[61] Although adult fish return to the ocean or lower estuary after spawning, juveniles remain in nursery habitats through the summer before migrating seaward in late fall.[62] As previously noted, the LCFR includes habitat designated as primary nursery areas by the Division of Marine Fisheries (DMF).[63] Primary nursery areas (PNAs) are those "in the estuarine system where initial post-larval development takes place" and "populations are uniformly early juveniles."[64] The affected segment is also designated as an anadromous fish spawning area (AFSA) by DMF and the Wildlife Resources Commission.[65] This means "evidence of spawning anadromous fish has been documented in [DMF] sampling

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something tagged onto a water's current classification and/or a change in the classificaiton [sic] in order to have it delisted (that tag could reference .0227 perhaps).")

[59] E-mail from Anne Deaton, NC DENR, to Elizabeth Kountis, NC DENR (July 8, 2014) ("DMF does not support the reclassification due to the concentration of not only sturgeon in the river, but use by a diversity of other anadromous and estuarine fish species.").

[60] E-mail from Fritz Rohde, NOAA, to Stephania Bolden, NOAA (May 20, 2014) (asking recipient for "reports that document impacts of low DO and low pH on sturgeon").

[61] Cape Fear River Partnership, Cape Fear River Basin Action Plan for Migratory Fish 18 (April 2013), *available at* http://www.habitat.noaa.gov/protection/capefear/pdf/CapeFearActionPlan.pdf.

[62] Id.

[63] 15A N.C. Admin. Code 03R .0103.

[64] 15A N.C. Admin. Code 03I .0101; *see also* 15A N.C. Admin. Code 02B .0202 ("Primary Nursery Areas (PNAs) are tidal saltwaters which provide essential habitat for the early development of commercially important fish and shellfish and are so designated by the Marine Fisheries Commission.").

[65] 15A N.C. Admin. Code 03R .0115(25); see also Division of Marine Fisheries, Anadromous Fish Spawning Areas (AFSA): Cape Fear River Area, Map 7, http://portal.ncdenr.org/c/document_library/get_file?uuid=f810ae29-ea4d-4801-a04f-850ff2bc4467&groupId=38337.

records through direct observation of spawning, capture of running ripe females, or capture of eggs or early larvae."[66]

Low dissolved oxygen levels can be particularly harmful in spawning and nursery areas because hypoxia "causes substantial mortality of developing embryos."[67] For this reason, EPA recommends more stringent dissolved oxygen criteria for the early life stages of both coldwater and warmwater fish.[68] Multiple scientists commenting on the proposed management strategy for the LCFR expressed concern about its impact on fish in early life stages.[69]

In addition to playing a role in the life cycles of multiple fish species, the lower Cape Fear River is home to two endangered species of sturgeon, suggesting a need for more stringent environmental protection.[70] "Maintenance and recovery of the water quality conditions required to sustain and recover federally-listed threatened and endangered aquatic animal species

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[66] Anadromous fish spawning areas are those "where evidence of spawning anadromous fish has been documented in Division sampling records through direct observation of spawning, capture of running ripe females, or capture of eggs or early larvae." 15A N.C. Admin. Code 03I .0101(4)(b).

[67] Denise L. Brietburg et al, Hypoxia, Nitrogen, and Fisheries: Integrating Effects Across Local and Global Landscapes, 1 Annual Review of Marine Science 333 (2009) ("Developing embryos are particularly sensitive because they lack the ability to behaviorally respond to low oxygen and because oxygen must diffuse across the chorion that encases the embryo."), http://moritz.botany.ut.ee/~olli/eutrsem/Breitburg09.pdf.

[68] US EPA, *Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras*, app. I (Nov. 2000), http://water.epa.gov/scitech/swguidance/standards/upload/2007_03_01_criteria_dissolved_docriteria.pdf.

[69] E-mail from Tom Augspurger, US FWS, to Elizabeth Kountis, NC DENR (April 23, 2014) ("[P]ublished information on desirable levels of dissolved oxygen for good striped bass production indicate survival of striped bass eggs and larvae are reduced at dissolved oxygen levels from 4 to 5 mg/L (Bain and Bain 1982) and that optimal ranges for larvae and juveniles are >6 to 12 mg/L (Hill et al. 1989; Nicholson et al. 1990)."); *id*. ("DO concentrations higher than the standard of 5 mg/L are desirable for spawning areas. The national dissolved oxygen criteria for sensitive life-stages in non-salmonid waters is a daily minimum of 5 mg/L and a weekly average of 6 mg/L. . . . At concentrations below these, larval mortality, altered growth, and behavioral changes have been reported in both field and lab studies."); e-mail from Brian Kreiser, Univ. of Southern Miss., to Gary Kreiser, NC DENR (May 22, 2014) ("I don't know where potential spawning grounds might be relative to the area they want to classify as a swamp, but that would be an important consideration. The early life stages are probably not going to be as hypoxia tolerant as adults or won't be able to behaviorally avoid those areas.").

[70] *See* Mary L. Moser & Steve W. Ross, Habitat Use and Movements of Shortnose and Atlantic Sturgeon in the Lower Cape Fear River, North Carolina, 124 Transactions of the American Fisheries Society 225 (1995).

contributes to the support and maintenance of a balanced and indigenous community of aquatic organisms and thereby protects the biological integrity of the waters."[71]

First, the lower Cape Fear is home to the Atlantic sturgeon, a species that NOAA's National Marine Fisheries Service first listed as endangered in 2012. Although the harvest of Atlantic sturgeon has been banned since 1991, the Atlantic States Marine Fisheries Commission (ASMFC) has stated that fishery management measures alone will not sustain stocks of Atlantic sturgeon without sufficient quality and quantity of habitat. As such, it bears emphasis that the estuarine waters of the lower Cape Fear river are precisely the type where juvenile Atlantic sturgeon "for months to years before emigrating to open ocean."[72] Moreover, ASMFC studies demonstrate that DO concentration is a "key habitat parameter[] for the structuring of juvenile Atlantic sturgeon habitat."[73]

The Lower Cape Fear also hosts a population of shortnose sturgeon, a species recognized by the federal government as endangered in 1967 and subject to a fishing moratorium since 1991. Juvenile shortnose sturgeon tend to locate in estuarine waters such as those in the LCFR. Consequently, "protection of essential habitats, especially nursery/summer habitats, from human caused dissolved-oxygen reductions and other impacts is critical."[74]

A number of scientists urged the agency not to subject endangered sturgeon species to additional environmental stress by allowing lower dissolved oxygen in the LCFR. One sturgeon specialist noted, "given their benthic nature, DO requirements, and tendency for the Cape Fear to have lower DO events I would imagine they are already often experiencing DO close (or low enough) to killing them."[75] A NOAA scientist observed that, "In habitats with DO less than 4.7 mg/L, young of year Atlantic sturgeon experience a loss in growth."[76] Another noted that "DO

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[71] 15A N.C. Admin. Code 02B .0110.
[72] Atlantic Marine Fisheries Commission, *Habitat Addendum IV to Amendment I to the Fishery Management Plan for Atlantic Sturgeon* 2 (Sept. 2012), http://www.asmfc.org/uploads/file/sturgeonHabitatAddendumIV_Sept2012.pdf.
[73] *Id.* at 3.
[74] Mark R. Collins et al, Primary Factors Affecting Sturgeon Populations in the Southeastern United States: Fishing Mortality and Degradation of Essential Habitats, 66 Bulletin of Marine Science 917, 917 (2000), available at
[75] E-mail from Joseph Facendola, NC DMF, to Bennett Wynne, NC WRC (June 2, 2014) (e-mail forwarded by Chip Collier, NC DMF to Adriene Weaver, NC DENR on June 4, 2014); *see also id.* (opining that "reduced WQ standards in the lower cape fear will have negative impacts on the sizes of sturgeon that we have movement data for, and I suspect that it could have a greater impact on YOY that we have no data for (and are far less mobile).").
[76] E-mail from Fritz Rohde, NOAA, to Elizabeth Kountis, NC DENR (May 13, 2014) (citing Secor and Niklitshcek 2001))."

levels below 5.0 mg/L and ph of 4.3 would be problematic for sturgeons of either species" in the river because "[f]undamentally, sturgeons are adapted for life in big, well-flowing rivers with good oxygenation 6-9 mg/L and ph with[in] 0.5 units of neutral."[77]

To protect aquatic life, the agency should fight against degrading water quality in the LCFR instead of capitulating at the behest of the regulated community. While polluters want the State to quit trying to protect the LCFR for use by aquatic life that requires "normal" pH levels above 6.8 and/or DO levels of above 5.0 mg/L, the agency should strive to manage the LCFR so as to provide for the best usage of the water body.

IV. Conclusion

For more than 30 years, the State has determined that the best usage of the lower Cape Fear by aquatic life is protected by the water quality standards for pH and DO associated with Class SC waters. For more than 15 years, the State has recognized that usage of the lower Cape Fear River by aquatic life is impaired by low DO concentrations. The State should not abandon efforts to return these waters to the conditions that support their best usage. Rather than adopt a water quality management plan that is designed to avoid necessary efforts to improve water quality, the State should continue to strive to "maintain, protect, and enhance water quality within North Carolina.[78] Accordingly, we urge the agency to reject the proposed management plan.

Thank you for the opportunity to comment on this important matter.

Sincerely,

Will Hendrick
Associate Attorney
Southern Environmental Law Center

cc (by e-mail):

[77] E-mail from Kenneth Sulak, USGS, to Fritz Rohde, NOAA (May 20, 2014). This e-mail was forwarded to NC DENR on May 20, 2014. See e-mail from Fritz Rohde, NOAA, to Elizabeth Kountis, NC DENR (May 20, 2014).
[78] N.C. Gen. Stat. § 143-215.2(b).

Frank Yelverton, Cape Fear River Watch
Grady McCallie, North Carolina Conservation Network
Gray Jernigan, Waterkeeper Alliance
Kemp Burdette, Cape Fear River Watch
Lauren Petter, USEPA- Region 4

Exhibit C

Memo to: NC Division of Water Resources, and NC Environmental Management Commission

From: Dr. Michael A. Mallin, Research Professor, Center for Marine Sciences, University of North Carolina Wilmington, Wilmington, NC, 28409

Date: February 9, 2015

Subject: Comment on the proposed reclassification of the lower Cape Fear River and Estuary to Class Sc-Swamp (Sw) classification.

1) I am very supportive of the statement in the reclassification proposal that states that any further municipal point sources will require the highest level of treatment in North Carolina. I would ask for more specifics regarding industrial discharges – at the least setting some limits on biochemical oxygen demanding agents such as biochemical oxygen demand (BOD), ammonia, total nitrogen (TN) and total phosphorus (TP).

2) An important statement that needs to be clarified is found in the narrative standards where it states that DO should not be less than 5.0 mg/L except that "swamp waters, poorly flushed tidally influenced streams or embayments, or estuarine bottom waters may have lower values if caused by natural conditions" . The issue that requires clarification is who decides, and by what criteria, if such a deviation is caused by "natural" conditions.

3) The proposed CFR reclassification does not adequately address non-point contributions of BOD or nutrients (which lead to BOD increases). If focus on non-point sources potentially contributing to oxygen depletion is continued to be addressed by on-going water quality programs; based on the summer blue-green algal blooms that occurred annually from 2009-2012, this approach has been inadequate and will continue to be inadequate.

4) In the lower Cape Fear River and Estuary, peer-reviewed research published in *Limnology and Oceanography* has demonstrated that BOD is driven by a number of biological and chemical factors (Mallin et al. 2004; Tables 4, 5 and 6) see the following:

- Chlorophyll *a* (the principal measure of algal bloom strength) has been positively correlated with BOD5 in the mainstem river at Lock and Dam #1 ($r = 0.55$, $p = 0.0001$), Browns Creek ($r = 0.45$, $p = 0.007$), Hammond Creek ($r = 0.45$, $p = 0.004$), Great Coharie Creek ($r = 0.51$, $p = 0.001$), Colly Creek ($r = 0.64$, $p = 0.0001$), Barnards Creek ($r = 0.37$, $p = 0.040$), Motts Creek ($r = 0.42$, $p = 0.020$), and Smith Creek ($r = 0.57$, $p = 0.0009$). I note that Browns, Hammond, Barnards and Smith Creeks drain directly into the mainstem river or estuary, while Colly and Great Coharie creeks drain into the lower Black River, a major 5th order tributary of the 6th order Cape Fear River.
- TN has been positively correlated with either BOD5 or BOD20 or both in the 5th-order Northeast Cape Fear River ($r = 0.30$, $p = 0.02$), the Black River ($r = 0.45$, $p = 0.0003$), Hammond Creek ($r = 0.47$, $p = 0.0003$), Six Runs Creek ($r = 0.54$, $p = 0.0005$), Great

Coharie Creek (r = 0.44, p = 0.006), Little Coharie Creek (r = 0.52, p = p = 0.0008), and Colly Creek (r = 0.54, p = 0.0005).

- TP has been positively correlated with either BOD5, BOD20 or both in the Northeast Cape Fear River (r = 0.34, p = 0.008) the Black River (r = 0.33, p = 0.010), Browns Creek (r = 0.40, p = 0.012), Hammond Creek (r = 0.42, p = 0.009), Six Runs Creek (r = 0.49, p = 0.002), Great Coharie Creek (r = 0.66, p = 0.0001), and Colly Creek (r = 0.39, p = 0.015).
- Chlorophyll *a* represents algal blooms, which upon death and decomposition become highly labile sources of BOD. Nutrients drive BOD in two ways: directly and indirectly. A peer-reviewed article in *Ecological Applications* by Mallin et al. (2004) showed that for streams in the Black and Northeast Cape Fear River basins, inputs of dissolved phosphorus directly stimulate BOD5 and BOD20, as well as natural bacteria abundance (the direct driver of BOD). The data also showed that inputs of dissolved nitrogen (nitrate ammonium, and urea) significantly stimulate algal growth, which in turn significantly stimulates BOD. Thus, the correlation between nutrient loading and BOD is not surprising.

5) The proposed reclassification is based on the Bowen (2009) model predicting DO concentrations in the lower Cape Fear River Estuary

- The Bowen model concludes that further reduction of current point sources would have little effect on DO concentrations – I will accept the model's conclusions on that matter.
- But, Bowen's model shows that reducing nutrient, carbon and BOD loads from the incoming rivers, creeks and wetlands by 30% and 70% would <u>increase</u> median DO from 5.6 mg/L to 5.85 and 6.2 mg/L, respectively – and this assumes sediment oxygen demand (SOD) stays the same regardless of reductions! See Bowen (2009) pages 6-4, 6-8, and 6-22 in particular for more on this topic.
- Assuming that such BOD load reduction would similarly reduce SOD, than the model says summer DO violations would decrease from 45% to 22% violations (30% reduction case), down to 7% (with 50% reduction) and down to only 1% violations (70% reduction case).
- I further note that SOD cannot simply be considered "natural" only. A year-long study of several tidal creeks in New Hanover County was published in the peer-reviewed journal *Hydrobiologia* (MacPherson et al. 2007). Results demonstrated that chlorophyll *a* concentrations were positively correlated with SOD ($r = 0.35$, $p < 0.05$), as well as BOD5 ($r = 0.50$, $p < 0.05$).

6) I note that Bowen does not discuss non-point source pollution sources specifically.

7) Yet, non-point runoff plays a major role in the middle to lower basin of the mainstem Cape Fear River, from crop agriculture, urban runoff and some livestock production. In the lower Cape Fear system I note that livestock waste pollution and crop agriculture are the predominant non-point nutrient and BOD sources in the Black and Northeast Cape Fear River basins.

8) Livestock manures as waste inputs were *not even mentioned* in Bowen's model! However, 2012 livestock counts for Brunswick, Pender, Duplin, Sampson, Cumberland

and parts of Bladen and Onslow Counties (Cape Fear lower watershed) are as follows (information for counties that are partially within the basin, Bladen and Onslow, are estimates):

- Hogs: approximately 5,000,000
- Turkeys: approximately 21,500,000
- Broiler chickens: > 122,000,000
- Other chickens: > 870,000
- Cattle: approximately 72,000

(from NCDA website September 2014)

Livestock wastes are clearly the largest source of BOD-forcing pollutants in the Cape Fear Basin – and remain virtually unregulated (i.e. no required streamside buffers, no required control of ammonia off gassing, etc.).

9) Industrialized swine farms (CAFOs) are a source of large-scale chronic nitrogen and phosphorus loading to nearby soils and receiving water bodies, nutrients which have been directly correlated to BOD in the blackwater streams and rivers of the Cape Fear Basin (Mallin et al. 2006). An peer-reviewed analysis by Cahoon et al. (1999) published in *Environmental Science and Technology* found that vast quantities of nitrogen and phosphorus feed are imported into the watershed annually to feed swine, poultry, and cattle in production facilities (CAFOs), which in turn annually load large quantities of nutrients as waste into the watershed. This analysis found that for the Cape Fear River basin alone, CAFOs produce 82,700 tons of nitrogen and 25,950 tons of phosphorus annually into this watershed. Thus, N and P enter the state as animal feed from elsewhere, but much of it leaves the livestock as manure (or carcasses) and enters soils or waters of the Coastal Plain.

10) Finally, swine waste lagoons, as well as lagoons servicing egg-laying poultry CAFOs, produce copious amounts of ammonia to the atmosphere; NC Division of Air Quality estimates a swine ammonia emission factor of 9.21 kg/hog-year. 9.21 x 5,000,000 head of swine = 46,050,000 kg or 46,050 metric tons of ammonia released to the airshed of the Cape Fear River basin (and coastal ocean) per year, much of which comes to earth within 60 miles of the source (Walker et al. 2000; Costanza et al. 2008). Ammonia is well-known in the environmental engineering literature to exert an oxygen demand (nitrogenous BOD) on waters – that is why it is regulated in wastewater discharges (Clark et al. 1977). Efforts need to be made to control this major source of oxygen-demanding wastes to the Cape Fear system as well.

11) Clearly, non-point sources of BOD, nitrogen, and phosphorus entering the waters of the lower Cape Fear River system are very large and lead to reduced dissolved oxygen levels.

I conclude that the proposed reclassification, as it stands, will be inadequate to produce or maintain proper dissolved oxygen concentrations in the lower Cape Fear River and Estuary due to the lack of attention to non-point sources of nutrients and BOD. The source of much of this pollution is industrial livestock production, along with unknown inputs from traditional agriculture, and some urban runoff in the Fayetteville and Wilmington areas. **Any**

proposed reclassification of the lower Cape Fear River and Estuary must include strong language specifically aimed at reducing such non-point sources of pollution.

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Comments on the Proposed Reclassification of the Lower Cape Fear River and Estuary to a Class Sc (Sw) Swamp

Prepared for Waterkeeper Alliance by JoAnn M. Burkholder, Ph.D., March 3, 2015

I. Overview

Since 1998, the lower Cape Fear River Estuary (LCFRE) segment from upstream of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut has been on North Carolina's 303(d) list of officially "impaired" (degraded) waters due to low dissolved oxygen (DO). In 2006, the state added impairment for pH, copper and turbidity to the 303(d) list for this segment. Throughout the past several decades, a subset of regulated point sources (i.e., with wastes mainly discharged to surface waters through one or more pipes) have been the state's focus for water quality improvement. In 2014, the North Carolina Division of Water Resources within the Department of Environment and Natural Resources (NCDENR-DWR) received a request from a group including various point source dischargers to reclassify the LCFRE from Class Sc to Class Sc-Swamp (Sw) (May 2014). The rationale given for the request included two points - first, that a recent modeling effort (Bowen et al. 2009) had assessed the 20 largest point sources in the lower Cape Fear River basin and concluded that the sources have little influence on water-column DO concentrations in the LCFRE; and second, the group asserted that significant reductions in pollutant loading from other sources which they call "background" loads would not achieve attainment for certain periods of the summer. The request specifically stated,

> ...modeling results indicate that [the 20 assessed] point-source discharges have a relatively minor impact on DO levels, and that even significant reductions in background (both natural and nonpoint source) loads would not result in attainment of the current standard for considerable periods of time during the summer. - May (2014)

Based on this request and information, NCDENR-DWR recently proposed to reclassify the LCFRE to a swamp (Sw) based on the misleading claim that, since the LCFRE cannot meet its present DO standard (≥ 5 mg/L) by controlling the 20 identified point sources alone as assessed in Bowen et al.'s (2009) model, a TMDL (total maximum daily load) to achieve the DO standard would be inappropriate. The proposed reclassification of the LCFRE to a swamp is not consistent with sound science or the law for three reasons:

1. The available evidence shows that the major sources of oxygen-demanding materials in the LCFRE are due to pollution from human activities which are subject to regulation and can be controlled. The major sources of oxygen-demanding materials are **not** natural wetland drainage or other natural background sources. Natural wetland drainage appears to add only a fraction of the massive contribution of oxygen-demanding materials, high levels of toxic copper, high turbidity, and many other pollutants that are being contributed by pollution from point sources, other regulated sources and nonpoint sources (see Sections IIID-E of these Comments).

2. Under the Clean Water Act, the required TMDL for the LCFRE must address ***all*** pollution sources, including point sources, other regulated sources, and nonpoint sources, in the watershed (see Section IIID of these Comments). In its proposed action, NCDENR-DWR has *not* considered ~22 NPDES-permitted point sources in the lower Cape Fear basin, or *any* of the ~153 NPDES-permitted point sources in the upper and middle Cape Fear River basin, which contribute to the impaired (degraded) water quality of the LCFRE which is at the receiving, lower end of the basin. NCDENR-DWR *also* failed to consider the impact of the nearly 1,000 industrial-scale swine Animal Feeding Operations as well as an unknown number of industrial-scale poultry Animal Feeding Operations, many of which are Concentrated (Confined) Animal Feeding Operations (CAFOs) and, thus, point sources under the Clean Water Act. These sources were also omitted from specific analysis in the Bowen et al. (2009) model, although many of the industrial facilities are located in the lower basin (see Section IIIE of these Comments). As a scientist, I first approached their inclusion in these Comments by checking the formal definition of CAFOs in the Clean Water Act (Section 502(14)). *CAFOs are formally defined there as point sources.* They are supposed to be regulated using National Pollution Elimination Discharge System (NPDES) permits, as other industrial point sources are regulated. There are about five million swine in the Cape Fear basin. Each swine produces, on average, about four times more sewage than one person (see Section IIIE). Therefore, the swine CAFO point sources, which are predominantly in the lower Cape Fear basin, contribute roughly the same amount of sewage to that relatively small area, *per year*, as 15 million people. Moreover, swine wastes are much richer in oxygen-demanding materials than human sewage. Industrialized poultry production, also massive in the Cape Fear River basin, contributes to oxygen-demanding materials and other water quality degradation of the LCFRE as well (see Section IIIE). Overall, ~175 NPDES-permitted point sources in the Cape Fear River watershed, and nearly 1,000 swine CAFO point sources as well as an unknown number of poultry CAFOs, were not identified and appropriately evaluated by Bowen et al. (2009) and NCDENR-DWR. These sources are not simply "background" as misleadingly characterized in the materials underlying the NCDENR-DWQ Proposal to reclassify the LCFRE and in the Proposal itself. Collectively, and often individually, these facilities are **extreme**, chronic pollution sources of oxygen-demanding materials to the LCFRE. They can be, and should be, addressed through state regulatory programs, the Clean Water Act and a TMDL for the LCFRE.

3. *Significant reductions in the erroneously termed "background" loads* **would** *achieve attainment of the present DO standard in the LCFRE segment.* As explained above, what was misleadingly and inaccurately called "background" in the lower Cape Fear basin includes the point source pollution from ~175 NPDES-permitted point sources in the Cape Fear River watershed, and from nearly 1,000 swine CAFOs and an unknown number of poultry CAFOs. All of these pollution sources were not among the 20 considered by Bowen et al. (2009) as the main point source contribution to the LCFRE. These sources were, at least, tacitly included in Bowen et al.'s (2009) model within a category called "tributary inputs." The model predicts that a reduction of 30% of the "tributary inputs" would result in median DO levels in the LCFRE that exceed 5 mg/L -- that is, higher than the state standard -- and that a

70% reduction in the "tributary inputs" and the internal oxygen demand (below) largely resulting from these inputs would bring the LCFRE into compliance 99% of the time.

If the proposed reclassification occurs, NCDENR-DWR will accomplish a contrived, highly artificial "official change" of a major, strongly flowing estuary of national importance to a "swamp" with no scientific basis. Rather than providing cleanup and protection of the impaired segment -- which has been officially designated as impaired and in need of improved protection for nearly two decades -- this action would allow much more pollution to occur there, in violation of the Clean Water Act. Consequently, NCDENR-DWR's proposed reclassification would jeopardize the designated uses of the LCFRE. The LCFRE should *not* be reclassified as a swamp.

The scientific facts briefly mentioned above, which accurately describe the status of the LCFRE and the pollution affecting it, are explained in detail in the following comments, supported by peer-reviewed science literature and findings from federal agencies such as the U.S. Department of Agriculture (USDA) and the U.S. Environmental Protection Agency (USEPA).

II. The Mighty Cape Fear River

The Cape Fear River basin, completely contained within North Carolina, is the largest watershed in the state, covering ~16.5% (~9,324 square miles) of total land area. It also contains the largest number of stream miles (6,204) in North Carolina (Lin et al. 2006, Bowen et al. 2009 and references therein). The 26 counties within or overlapping the watershed are expected to grow from 3 million to about 5 million people over the next 20 years.[1] There presently are about 1.7 hogs per person in the Cape Fear basin, and industrialized swine production as well as turkey production in the lower basin are among the most concentrated in the world (Mallin et al. 2003).

The LCFRE is "extremely important... because of its function as a nursery for juvenile fish, crabs, and shrimp . . . The river is also an important natural resource that supports many uses including industry, transportation, recreation, drinking water, and aesthetic enjoyment" (Bowen et al. 2009). On a popular tourism website[2] are quotes such as the following about the LCFRE (emphasis added):

- Hard to review a river! It's *wild, powerful,* beautiful in all seasons....
- Amazing to walk down on the observation area and look at *how fast the river moves through this area.* You can understand how and why it got its name.
- *Cape Fear river current is very swift and strong.*

Thus, casual observers can discern that this segment of the LCFRE is highly river-influenced with strong flow. Bowen et al. (2009, p. 2-4) wrote, "[f]rom a hydrodynamic perspective,

[1] (NDENR) http://www.eenorthcarolina.org/images/River%20Basin%20Images/final_web_capefear.pdf.

[2] (http://www.tripadvisor.com/ShowUserReviews-g49673-d107702-r242913110-Cape_Fear_River-Wilmington_North_Carolina.html#REVIEWS

the Cape Fear has approximately a two-meter [~6-foot] tide range and strong tidal currents (> 0.5 meter per second) in the navigational channel of the open estuary and in the narrower tidal river channels of the three major tributaries (the mainstem freshwater river, and the Northeast Cape Fear and Black Rivers)." The LCFRE system is, in fact, documented in the science literature as strongly flowing down to its confluence with the Atlantic Ocean (e.g. Ensign et al. 2004, Lin et al. 2006, Becker et al. 2010). The strong flow minimizes stagnant areas and helps to add oxygen from the overlying air (Wetzel 2001).

It has been erroneously suggested in the NCDENR-DWQ Proposal and supporting materials that this strongly flowing, high-volume river is so strongly influenced by oxygen-demanding materials from natural drainage of freshwater wetlands and saltmarshes that the LCFRE is "swamp-like" with respect to DO conditions. Slowly flowing blackwater streams with instream wetlands in the Coastal Plain of the southeastern U.S. *can* receive high inputs of DO-demanding materials from the wetlands, and DO can range from 4-6 mg/L (Mallin 2000, Todd et al. 2009, and references therein). However, *such characteristics of slow flow and in-stream wetlands do not characterize most of the LCFRE system.* One area of the estuary north of Wilmington which receives major influx of swine wastes from CAFOs, near the junction of the Cape Fear, Black, and Northeast Cape Fear Rivers, has been described as prone to low DO levels during summer-early fall, but the low DO levels there have been related to *high anthropogenic pollution* along with inputs of natural organic materials (Mallin et al. 2003). Water quality in that area, as throughout the segment, would be greatly improved by reducing the high anthropogenic pollution coming into the segment from the many regulated pollutions sources in the Cape Fear watershed that were inappropriately excluded from consideration or lumped in with background sources in the NCDENR-DWR Proposal and supporting materials.

III. Sources of Water Quality Impairment

A. Historic Background, Assessments, and Erroneous Assertions

Historically, the LCFRE system was considered non-eutrophic because of its rapid flushing (Ensign et al. 2004). In the upper and middle Cape Fear River during 1955-1980, Crawford (1985) noted that DO concentrations at Lock 1 averaged 8.2-8.4 mg/L depending on the data source, and that on only two occasions from 1975 to 1980, DO samples were above 4 mg/L but less than 5 mg/L. Similarly, NCDENR (1999) described the upper portions of the estuary in the 1990s as rarely having sustained low DO levels that caused problems (assumed to refer to problems for aquatic life). The present-day LCFRE, however, is impaired due to major pollution from the upper, middle, and lower watershed (Cahoon et al. 1999, Mallin 2000, Mallin et al. 2003). As a result of declining water quality due to many pollution sources, for the past ~15 years the Cape Fear Estuary has been characterized as moderately eutrophic (= moderately nutrient-polluted; Bricker et al. 1999).

As described by NCDENR (2005),

> The [Cape Fear] watershed (about 9,149 square miles) is the most heavily industrialized in North Carolina with 244 permitted wastewater discharges and (as of 2000) over 1.83 million people residing in the basin....

> Approximately 24% of the land use in the watershed is devoted to agriculture and livestock production.

Historically, post-European settlement, the lower Cape Fear River and Estuary received mostly raw (untreated) or partially treated wastes from the Riegel Paper Corporation (in Wilmington; became Federal Paperboard Company, and then International Paper from 1996 to the present) and the various, relatively small human population centers that developed along it (State Stream Sanitation Committee 1957, CH2MHill 2014a - Technical Memo 1 in May 2014, used to support the request for reclassification of the LCFRE segment). CH2MHill (2014a) described the previous situation as "significant impacts from untreated and poorly treated wastewater under low to moderate flow conditions in the river" prior to improvements in waste treatment. In the mid-1950s on one date (August 30, 1955), low DO (1.3-2 mg/L) and low pH (5-6) were measured in the Northeast Cape Fear and Black Rivers, the two main tributaries to the Cape Fear Estuary other than the mainstem Cape Fear River as mentioned. On two dates (July 23-24, 1956) during moderate flows from these two tributaries and high flow from the mainstem Cape Fear River, DO and pH in the lower river were 2.8-4.9 mg/L and 6.8-7.2, respectively. The interpretation from this sparse information (three dates, ~60 years ago) was that "*under some situations*, swamp drainage conditions *could* significantly influence DO and pH conditions in the river. . .." (emphasis added) (State Stream Sanitation Committee 1957, CH2MHill 2014a).

From there, however, a major "leap" occurred in CH2MHill's (2014a) writing (p.D-15 in May 2014): Riparian wetlands -- that is, natural wetland drainage -- were described, without any other supporting data, as the "significant contributors to the tremendous loads of oxygen-demanding materials." CH2MHill (2014a, p.D-15) secondarily acknowledged that inputs of biochemical oxygen demand (BOD) have also been contributed by raw and partially treated sewage, and from swine wastes, although CH2MHill mistakenly stated that swine wastes only contribute pollution to the LCFRE when cess pits breach. As corrective information, swine wastes *routinely* contaminate the LCFRE (see Section IIIE of these Comments), and researchers have evaluated swine CAFO wastes as a major source of BOD in the LCFRE (e.g. Mallin et al. 1997, 2006; Mallin 2000). Yet, the remainder of CH2MHill's (2014a) writing implicated natural drainage from wetlands as the major contributor of oxygen-demanding materials to the LCFRE. In the 1950s, the Cape Fear basin had less industrialization and fewer point sources (including no CAFOs), but the present reality is far different. As explained above, the Cape Fear River basin is *now* described as the largest, most industrialized watershed in North Carolina (Mallin et al. 2003, NCDENR 2005).

TetraTech (2014 - Technical Memo 2 in May 2014, used to support the request for reclassification) considered BOD loads from three specific point sources, which they erroneously described as contributing about 90% of all point source loads to the LCFRE. In reality, these three point sources contribute only a small fraction of the total point source loads - see Section IIID-E of these Comments. Based on data from the previous 20 years, TetraTech reported a significant downward trend (~23% decrease over time) in oxygen-demanding pollutant loads from the three selected point sources, without a corresponding decrease in water-column DO. The lack of a corresponding decrease in average DO should have been expected, considering that TetraTech *did not* assess ~1,194 other regulated sources in the Cape Fear watershed that are contributing oxygen-demanding materials and other pollution to the LCFRE. Over the same 20-year period in the Cape Fear River basin,

the human population increased by ~0.66 million and swine production increased by ~5 million animals per year (compiled from U.S. Census Bureau data, Burkholder et al. 1997, and Cahoon et al. 1999). Yet, TetraTech (2014) implicated wetlands as the major contributor to oxygen-demanding materials in the the LCFRE. TetraTech stated that the information from its recent analysis supported its previous assessments of the LCFRE (TetraTech 2001, 2003), and erroneously maintained that its assessment supported reclassification of the LCFRE segment to a swamp.

CH2MHill (2014b - Technical Memo 4 in May 2014, used to support the request for reclassification) described an analysis of surface water quality conditions in summer (which was defined as April-October) at main inflows to the Cape Fear River Estuary including the Middle Cape Fear River, the Black River, and the Northeast Cape Fear River. Importantly, *the Northeast Cape Fear River and the Black River stations were* ***erroneously*** *described as characteristic of "water quality as water leaves areas currently classified as swamps."* These segments are classified as swamps, but their present water quality reflects massive pollution, not natural wetland inputs (see Section IIID, p.18 below). During the early to mid-1990s, the relatively small areas of the Northeast Cape Fear and Black River watersheds sustained an influx of more than 800 swine CAFOs with more than 3 million swine produced per year (NCDENR 2005; and F*igures 1 and 2*). They contribute roughly the same amount of wastes as 12 million people, and the wastes are poorly regulated (see Section IIID).

Bowen et al. (2009) tacitly included pollution from swine feeding operations in "tributary inputs" although they were not specifically mentioned. CH2MHill (2014b) and TetraTech (2014) not only failed to mention them (and in CH2MHill 2014a, there was only one, partly inaccurate mention of swine operations as described above), but also omitted them from consideration. All of the other point source contributions from the upper and middle watershed were not considered as well. The omission of CAFO wastes and most other point sources in the watershed from consideration in assessments of oxygen demand in the LCFRE is irrational rather than science-based. The extreme error of omission in those reports is compounded by an equally extreme error of co-mission - repeatedly attributing to natural wetland drainage the massive oxygen-demanding pollution known to be contributed by other sources including CAFOs (e.g. Dewi et al. 1994, Burkholder et al. 2007 and references therein; see Section IIID below). Similarly, NCDENR was described by May (2014, p.D-3) as having stated, erroneously, that "changes in the classification of the LCFRE might be appropriate to recognize the influence of natural drainage from riverine and saltwater marsh systems in the watershed on DO concentration."

There is no basis in fact - no data - supporting major attribution to natural freshwater wetlands and saltmarshes of what CH2MHill (2014a) described as "tremendous" loads of oxygen-demanding materials in the LCFRE, while "overlooking" the massive pollution from ~98% of the point and other regulated sources in the watershed.

B. Processes Influencing DO Conditions, and Available Information for the LCFRE

Several major processes influence water-column DO concentration in rivers (*Figure 3*). Oxygen demand from two general sources controls water-column DO: *external* (incoming)

materials from land-based sources, upstream waters and the overlying airshed, usually referred to as the BOD in the water column, and the "*internal*" oxygen demand from biota respiration and river bottom sediments, usually called the sediment oxygen demand (SOD).

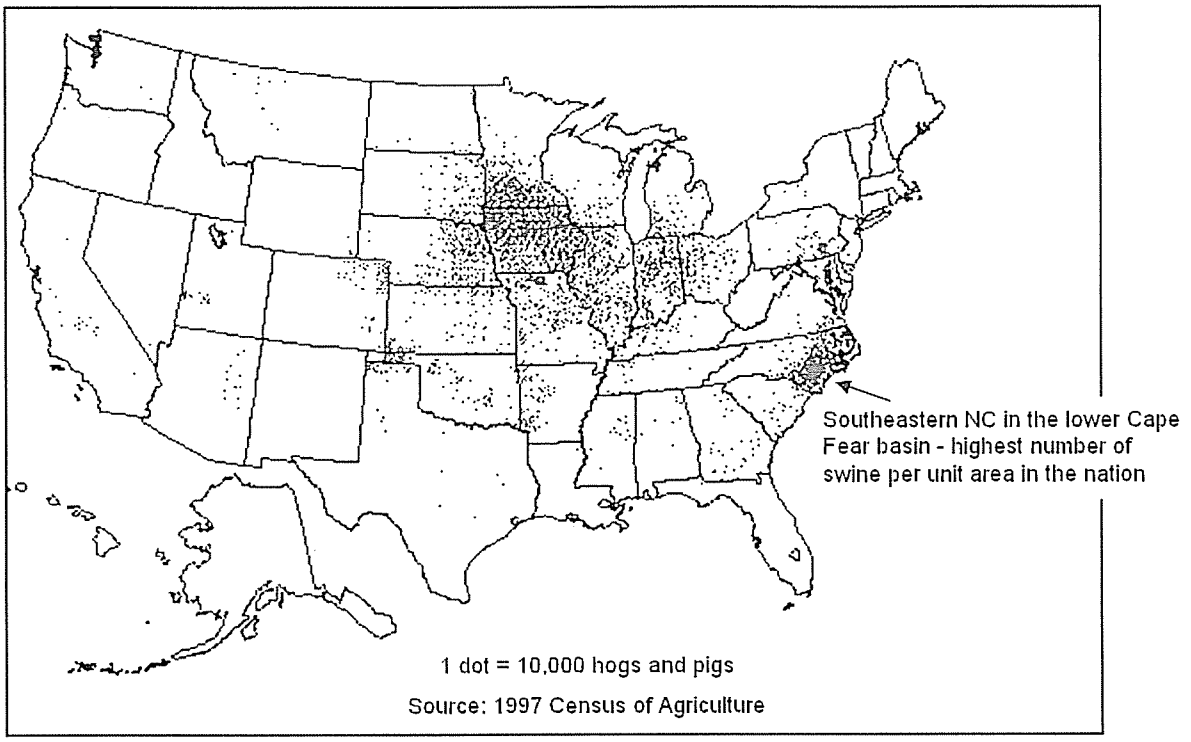

Figure 1. Map showing the number swine in southeastern North Carolina, with most CAFOs in the lower Cape Fear River basin area (source: http://scorecard.goodguide.com/env-releases/aw/nc-riverbasin.tcl?image_id=030300&huc6=030300). This map, produced by the USDA based on 1997, data, is supported by a more recent map, available at http://www.agcensus.usda.gov/Publications/2012/Online_Resources/Ag_Atlas_Maps/Economics/Market_Value_of_Agricultural_Products_Sold/12-M030.php, which shows the value of hogs and pigs sold in 2012 as the percent of the total market value. The highest concentration of swine per unit surface area across the nation is in the lower Cape Fear River basin.

BOD (units, milligrams per liter, mg/L) is the sum of carbonaceous and nitrogenous oxygen demands; it is a measure of the molecular oxygen used in the water column during a specific incubation period, usually 5 days, for the biochemical degradation of organic material (carbona-ceous demand) and the oxygen used to oxidize inorganic material (nitrogenous demand), as well as the amount of oxygen used to reduce forms of nitrogen (Eaton et al.1995, MacPherson 2003).

SOD (units, grams of molecular oxygen per square meter per day, g O_2 /m^2/day) is defined as the rate of DO removal from the water column due to the decomposition of organic matter in the bottom sediments (Hatcher 1986). It consists of biological sediment oxygen demand (usually at the sediment surface, dominated by bacteria that consume organic materials) and chemical sediment oxygen demand (usually ~2 inches down in the sediment, where anaerobic

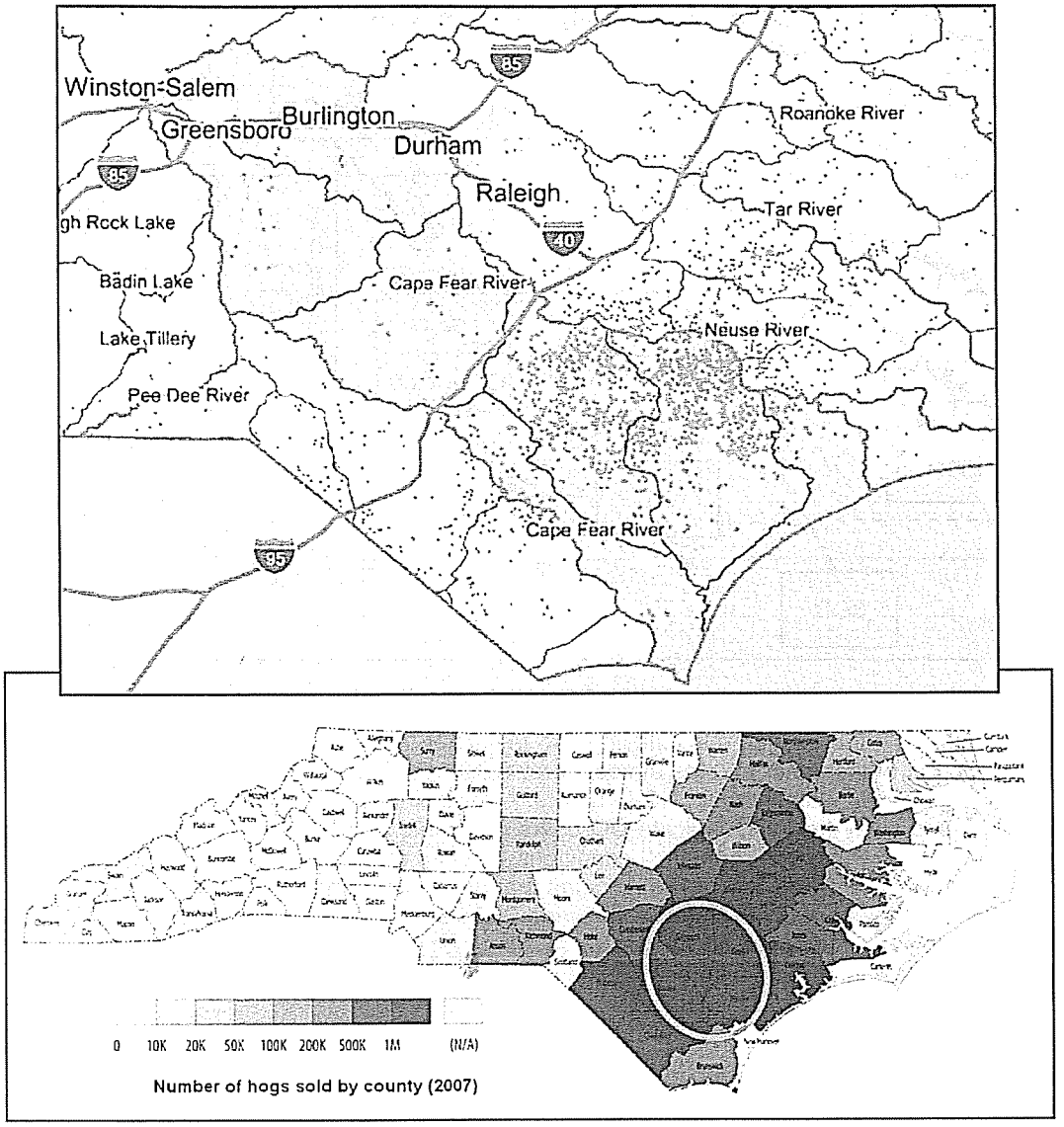

Figure 2. Upper panel - map showing the locations of swine CAFOs in North Carolina, indicating the preponderance of CAFOs in the lower Cape Fear River basin (source: http://scorecard.goodguide.com/env-releases/aw/nc-riverbasin.tcl?image_id=030300&huc6=030300, last accessed in February 2015). Lower panel: Map showing the numbers of hogs sold in North Carolina counties during 2007 (K ≡ thousands, M ≡ millions; U.S. Census data), modified from Learn NC, a program of the University of North Carolina School of Education (available at http://www.learnnc.org/lp/editions/nchist-recent/6257, last accessed in August 2014). The darker area "down east" on the Coastal Plain of the state has, as mentioned, the highest concentration of swine per unit area in the nation (National Hog Farmer 2014.).

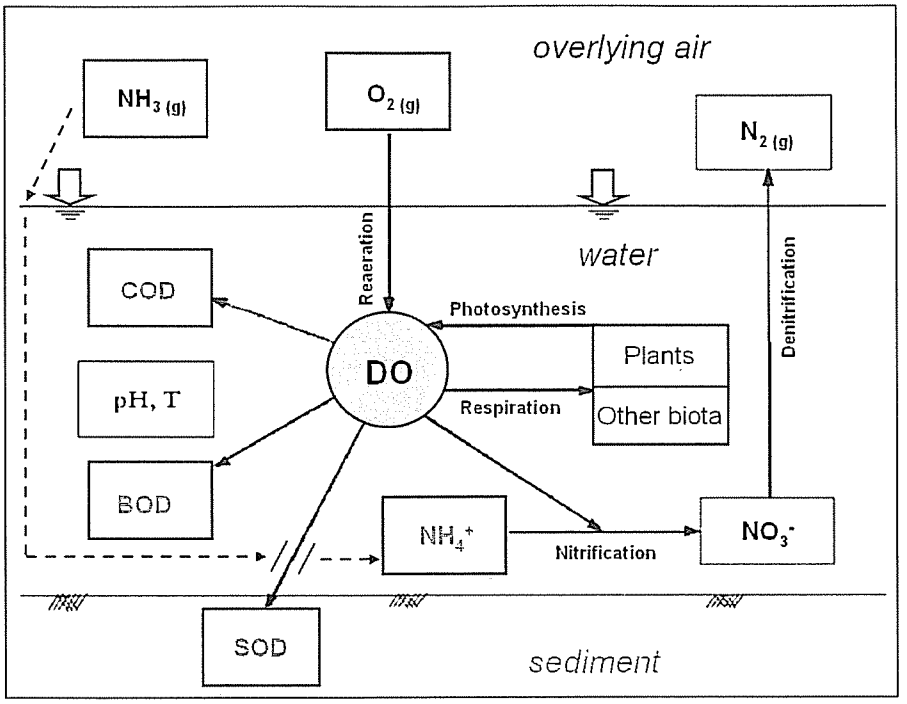

Figure 3. A schematic of the major processes influencing the water-column ("water") DO concentration in rivers: O_2 = the oxygen gas diffusing into the water from the atmosphere; N_2 - the nitrogen gas diffusing out of the water into the atmosphere; COD - the immediate chemical oxygen demand; T - temperature; NH_4^+ - ammonium; NO_3^- - nitrate. Arrows directed toward DO indicate DO sources; arrows directed away from DO indicate DO users (consumers or "sinks"). Parameters in red are oxygen-demanding. Other environmental conditions that can affect DO are represented by pH and temperature (T). The dashed-line arrow indicates that ammonia from the overlying airshed, largely contributed in southeastern North Carolina by swine CAFOs (Walker et al. 2000, Aneja et al. 2003), is mostly ionized to ammonium in neutral to alkaline waters and becomes a source of nitrogenous oxygen demand in forming nitrate. Modified from Cox (2003).

anaerobic bacteria degrade organic matter in a process that produces reduced ions that react with oxygen when they diffuse upward to an oxidized area (Walker and Snodgrass 1986).

The organic materials contributing to SOD can come from outside the system (such as leaf litter or settling of organic particles from human or animal wastes), or from within the system (such as decomposing algae). SOD is positively related to the amount of organic carbon content (i.e., bioavailable organic materials) in the sediment (MacPherson 2003 and references therein). Basically, the rate at which the sediment community consumes oxygen indicates whether the sediment area is degraded by too much organic matter (Massachusetts Water Resources Authority 2002). Once organic material reaches the bottom sediments of the river segment, SOD is influenced by two different processes: the rate at which oxygen diffuses into the sediments and is consumed there, and the rate at which reduced organic substances move into the water column and are then oxidized (Bowie et al. 1985, Todd et al. 2009).

Thus, SOD is the combination of the respiration of bottom-dwelling organisms in the sediment from decomposition of organic matter, and chemical oxidation of reduced substances in the sediment (Todd et al. 2009, and references therein). SOD can create oxygen deficits by reducing the amount of available oxygen in the overlying water (Seiki et al. 1994), and it can be a significant percentage of the total oxygen consumed in a given river or estuary (Caldwell and Doyle 1995). SOD rates serve as proxies for the effects of pollution on the biological activity of the bottom (benthic) community; for example, a nutrient-polluted system generally has an increased demand for oxygen (Natural Research Council 2000). Extreme levels of SOD (~20 $g/m^2/day$) can occur from oxygen consumption by animal wastes or sewage materials that settled out to the bottom (Davis 1950). Reduction in the amount of incoming organic materials from such pollution can lower the SOD as the system recovers (see Massachusetts Water Resources Authority 2002).

The sophisticated three-dimensional, Environmental Fluid Dynamics Code model used by Bowen et al. (2009) requires extensive information for the many factors needed to construct (parameterize) it for a specific river segment (Hamrick 1992; Bowen et al. 2009 - see p.v, Table 1, and Figure 2 in that document). Adequate measurements from the LCFRE for many of these factors were/are not available, and they vary considerably from river to river (Hamrick 1992, Todd et al. 2009, and references therein). The required missing or sparse (inadequate) information includes oxygen fluxes between the water column and the bottom sediment of the river. The information was instead "prescribed" (estimated, or taken from general literature not specific to the LCFRE) (Bowen et al. 2009, p.2-1). Bowen et al.'s (2009) model development revealed that, as in many if not most lower rivers along coastlands, SOD has an especially significant impact on DO concentrations. *SOD varies by as much as three orders of magnitude (1,000-fold) from river to river*, with rates ranging from ~0.1 to 18 grams of oxygen [demand] per square meter per day ($g/m^2/day$) (Rolley and Owens 1967, Chapra 1997, Todd et al. 2009). Importantly,

> The effect of SOD on the oxygen budget of an entire river system should not be underestimated, as it can be a critical sink of DO (Wu 1990). Indeed, in some rivers SOD can account for over half of the total oxygen demand and can play a primary role in the water quality....[Yet] this parameter is often assumed (or estimated) in water quality models (Hatcher 1986, Matlock et al. 2003). Errors in this measurement could lead to inaccurate models for the stream environment, at great biological and financial cost. - Todd et al. (2009)

Only sparse, dated SOD information was available for the LCFRE, taken more than a decade ago by the former NCDENR – DWQ (Division of Water Quality) at five locations on only five dates during summer/fall of one year, 2003 (Bowen et al. 2009, pp. 2-14, 2-15). At a given location, SOD is known to vary substantially by season and from year to year (Hatcher 1986, MacPherson 2003 and references therein). Lacking sufficient data and, thus, finding these sparse data to be a poor fit for the model overall, Bowen et al. (2009) "selected" SOD values until they found one that best fit their model for predicting water-column DO data, which had been constructed using available water-column DO measurements. In other words, Bowen et al. knew what the water-column DO had been because it had been measured during the period of focus, so they tried different SOD values until the model generally "fit" the water-column DO data. The SOD value (adjusted in an attempt to allow

for seasonal changes) was applied to most of the LCFRE; a second, nearly four-fold higher value for SOD was applied to the Northeast Cape Fear River which is heavily influenced by swine CAFOs (see p.18 below). Bowen et al.'s (2009) approach to estimate SOD technically requires that all rates except SOD have been accurately determined based on data for the specific system (Cox 2003). In reality, some of the data needed to accurately estimate the major rates of processes shown in *Figure 3* of these Comments (photosynthesis, respiration, nitrification, denitrification, reaeration) are lacking at representative points along the LCFRE system. Such data should include at least monthly measurements from April through October during dry, average-precipitation, and wet years (Hatcher 1986 and references therein).

C. The Model Predicted 90% Control of LCFRE DO Levels by the "Tributary Inputs," and Compliance with the DO Standard by Reducing Those Inputs

Despite the above-described weaknesses, Bowen et al.'s (2009) model *did* predict - as would be expected from knowledge of pollution sources in the LCFRE basin - that the 20 point sources they considered had only a small effect on the water-column DO concentrations. In contrast, "tributary inputs," loosely defined as excluding the 20 point sources, were evaluated as the major controlling influence on DO. Importantly, when Bowen et al. artificially forced SOD to remain constant over time despite imposing reductions of 30%, 50%, or 70% in BOD loads from the "tribuary inputs," the model predicted that the BOD decreases alone would increase median DO concentrations to well above the present DO standard of 5 mg/L. In addition, if BOD from tributary inputs and SOD were both reduced by 30%, the model predicted that summer DO violations would decrease from 45% to 22%, down to only 7% with a 50% reduction, and down to 1% with a 70% reduction. Such a scenario of decreasing BOD and SOD is realistic, as SOD is known to decrease over time with decreasing water-column BOD inputs, and related decreases in the bioavailabilty of organic matter that settles out to the sediments (Hatcher 1986, MacPherson 2003 and references therein).

Bowen et al. (2009) did not attempt to address the predominant sources in the "tributary inputs." They aptly noted (pp. vii-viii) that their model indicated the importance of benthic fluxes of oxygen. They also aptly recommended additional work to assess SOD and also, importantly, to separately consider the effects of wetland (natural) versus "riverine" (pollution carried by the river and tributaries) loadings to DO conditions in the estuary. The subsequent work in support of this proposal did not conduct these evaluations.

D. Point Source Pollution from NPDES-Permitted Facilities Upstream from the LCFRE

Given the above predictions from Bowen et al.'s (2009) model, control of "tributary inputs" *would* allow the LCFRE to attain the present DO standard. Therefore, a TMDL for the LCFRE segment is entirely appropriate. Moreover, as stated, the available scientific information indicates that human-related pollution - not natural wetland drainage - is the major source of oxygen-demanding materials to this segment (see pp. 18-19 below).

The U.S. EPA states that:[3]

[3] http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/overviewoftmdl.cfm#tmdlrequired

the objective of a TMDL is to determine the loading capacity of a given water body and to allocate that load among different pollutant sources so that the appropriate control actions can be taken and water quality standards achieved....**All contributing sources of the pollutants** (point and nonpoint sources) are identified, and they are allocated a portion of the allowable load...." (emphasis added).

Thus, a TMDL for the LCFRE should consider the entire watershed above that segment as potentially contributing to pollution in that segment. According to NC DENR[4], the upper-middle Cape Fear basin has 38 major point sources (discharging ≥ 1 mgd; *Figure 4*) and ~115 minor point sources (< 1 mgd) with NPDES permits. The lower Cape Fear basin contains 10 major point sources and 33 minor point sources with NPDES permits. Thus, the river sustains loading from 195 NPDES-permitted point sources including nearly 50 major NPDES-permitted point sources and nearly 150 minor NPDES-permitted point sources. Consider the following example of a major point source that was not among the 20 specifically assessed by Bowen et al. (2009):

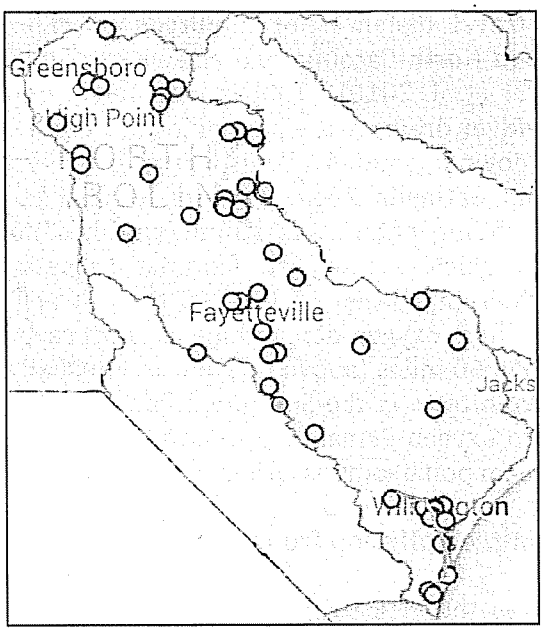

Figure 4. Map showing the locations of major point sources with NPDES permits from NC DENR in the Cape Fear River basin (red dot, Smithfield Packing Company; red line - approximate location of the LCFRE segment proposed for reclassification). Modified from NC DENR (see websites given in footnote 4).

The Smithfield Packing Company at Tar Heel in the mid-Cape Fear River basin, ~60 miles upstream from the LCFRE (location indicated by the red dot in *Figure 4*), is permitted to discharge up to 3 mgd of effluent containing up to 250 pounds of BOD_5 per day during April - October as a monthly average, and up to 500 pounds of BOD_5 as a daily maximum (NC DENR permit #NC0078344). During November-March, the plant is permitted to discharge double those amounts (i.e., 500 pounds per day, monthly average; 1,000 pounds per day, daily maximum, equivalent to 45 mg of biochemical oxygen-demanding materials/L). Rivers are considered to be stressed with too much BOD_5 if concentrations exceed 3 mg/L (Mallin et al. 2006). The plant is also permitted to discharge 30 pounds of ammonia-N/day as a monthly average during April-October, and 60 pounds of ammonia-N per day (7.5 mg/L) as a daily maximum. In November-March, these numbers, as pounds per day, can double. As explained, ammonia is oxygen-demanding, highly toxic to sensitive aquatic life, and a form of inorganic nitrogen that, at concentrations of only 0.1-0.2 mg/L, can stimulate noxious and toxic algal outbreaks (Bricker et al. 1999 and references therein, Mallin 2000). Other inorganic nitrogen forms, nitrate+nitrite, in discharges from the plant can be up to ~120 mg/L as a monthly average, and up to ~185 mg/L as a daily maximum. As stated,

[4] 2014 - http://portal.ncdenr.org/web/wq/npdes-major-facility-map, and http://portal.ncdenr.org/web/wq/npdes-minor-facility-map.

only 0.1-0.2 mg/L of inorganic nitrogen is needed to stimulate noxious and toxic algal outbreaks. Thus, extremely high oxygen-demanding materials and inorganic nitrogen nutrient forms are permitted for discharge by this major point source.

Overall, nearly 150 NPDES-permitted point sources in the Cape Fear River watershed are upstream from or adjacent to the LCFRE. Some pollutants from these point sources, such as the highly soluble nitrogen species, nitrate, are highly soluble; nitrate, for example, is known to travel distances of hundreds of miles downstream from upper to lower watersheds in North Carolina and elsewhere (Mallin et al. 1993, Houser and Richardson 2010, Houser et al. 2010). That is why, for example, various pollutants from the upper Mississippi River drainage are known to contribute to the "dead zone" of little or no oxygen all the way down in southern Louisiana, near the river's confluence with the Gulf of Mexico (Goolsby and Battaglin 2001, Jacobson et al. 2011). Nutrient pollution contributes to oxygen-demanding materials by stimulating algal blooms that die and are then decomposed by bacteria which use oxygen for that process (Burkholder and Glibert 2013, and references therein). Based on the fact that nitrate, much less soluble pollutants such as phosphorus, and oxygen-demanding organic carbon materials can travel much longer distances than 60 miles (above references, Minshall et al. 1983, Meyer and Edwards 1990), the excessive nitrate in the Smithfield Packing Company discharge should be expected to contribute to oxygen-demanding materials in the LCFRE ecosystem. The same is true of other upstream point sources, other regulated sources and nonpoint sources.

E. Point Source Pollution from Animal Production in the Lower Cape Fear Basin

In addition to the ~150 NPDES-permitted point sources that should be considered by NCDENR in developing a TMDL to improve DO in the LCFRE, there are nearly 1,000 swine CAFO point sources in the lower Cape Fear basin (and an unknown number of poultry CAFOs, based on Mallin 2014). The available scientific information shows that swine CAFO point sources are the major source of water quality impairment in the lower Cape Fear basin.

Major degradation of the natural resources in the lower Cape Fear basin due to swine CAFO point sources -- encompassing degradation to the airshed, soils, groundwaters, and surface waters -- has been well-documented and is briefly summarized below. It merits mention that, throughout these Comments, the focus when considering CAFOs is on swine production because relatively little information about poultry production is available to scientists or other members of the general public (e.g. see Rothenberger et al. 2009a). North Carolina is second in poultry production among the states, but nearly all of the operations have fewer animals than are defined by the state legislature as a poultry CAFO, and most information is allowed to the general public only for poultry CAFOs. Thus, most information given below for industrialized animal production in the Cape Fear basin is substantially underestimated because it focuses only on swine.

The available information *does* show that poultry production is a major source of pollution in the Cape Fear watershed (Cahoon et al. 1999). According to the North Carolina Department of Agriculture (http://www.ncagr.gov/stats/coest/Index.htm), in 2012 the lower Cape Fear basin (Brunswick, Pender, Duplin, Sampson, and Cumberland Counties, and estimates for parts of Bladen and Onslow Counties) contained about 5 million swine,

21.5 million poultry, 123 million chickens, and 72,000 cattle. The facilities which produce these animals are *not* required to have streamside buffers, or to control of ammonia or hydrogen sulfide emissions etc. They *are* required to have what can only be described as grossly inadequate waste management because it clearly does not prevent major impacts to public trust natural resources (below). Cahoon et al. (1999) provided the following estimates for the Cape Fear River basin (recall that most swine production occurs in the lower basin):

- Swine: more than 7 million tons of fresh manure per year added to the lower basin;
- Poultry: 2.18 million tons of fresh manure per year;
- Cattle: 2.08 million tons of fresh manure per year;
- Total from this animal production: 82,700 tons of nitrogen (N) and 25,950 tons of phosphorus (P) (Cahoon et al. 1999), the two nutrients that are known to cause major noxious algal outbreaks (Burkholder and Glibert 2013).

Cahoon et al. (1999) concluded that:

> The eutrophication threat to these river basins [which included the Cape Fear River basin]... with expanding animal populations from the potential large nutrient loadings associated with intensive livestock operations is substantial.

Many contaminants are present in swine CAFO wastes and runoff, including extremely high levels of nutrients N and P, more than 100 microbes known to cause human disease, pharmaceutical chemicals that harm beneficial aquatic life, toxic heavy metals (especially copper and zinc), and pesticides such as toxic dithiocarbamates from sprayfield applications (Barker and Zublena 1995; Burkholder et al. 1997, 2007 and references therein, Iowa State University and The University of Iowa Study Group 2002, Extension Toxicology Network 2003). These contaminants can enter the surrounding environment through pathways such as leakage from poorly constructed cesspits, or during major precipitation events that cause cess pit overflow and runoff from recent sprayfield application, or atmospheric deposition followed by wet or dry fallout (Burkholder et al. 2007 and references therein). The magnitude and direction of transport depends on factors such as soil properties, contaminant properties, hydraulic loading characteristics, and crop management practices. Over-application of swine wastes to sprayfields can result in contaminants leaching through permeable soils into vulnerable aquifers (see Section IIIE - Groundwater Degradation from Swine CAFO Point Sources, below).

Contamination of surrounding public-trust surface waters such as the LCFRE in southeastern North Carolina is a common, routine problem *at recommended application rates* as well (e.g. Barker and Zublena 1995; Westerman et al. 1995; Zublena et al. 1995; Stone et al. 1995, 1998; Walker et al. 2000; Aneja et al. 2001, 2003). Improper disposal of animal carcasses and abandoned swine CAFO facilities also contribute to water quality problems. Siting of CAFOs in areas prone to flooding or where there is a shallow water table, such as in the lower Cape Fear basin, increases the potential for contamination of public trust natural resources as well.

Swine CAFO point sources in the lower Cape Fear basin - Swine CAFOs in southeastern North Carolina mostly were installed from the late 1980s through 1995. These CAFOs store

animal wastes in large cess pits (which the industry calls "lagoons") (*Figure 5*). After the solids mostly settle out, the liquid wastes are applied to relatively small sprayfields. The soils in the area are mainly sandy and shallow; the water table is only about three feet from the land surface (Burkholder et al. 1997 and references therein). The shallow, sandy soils simply cannot absorb the massive amounts of waste applied to them by the CAFOs, time after time per season, year after year (see example in *Figure 4*). Waste that is applied to the fields mostly percolates into the shallow groundwater and then moves to receiving streams and rivers (e.g. Evans et al. 1984). Most cess pits for these swine CAFOs were installed in North Carolina prior to 1993, when linings of clay or other materials were not required (Burkholder 1997 and references therein).

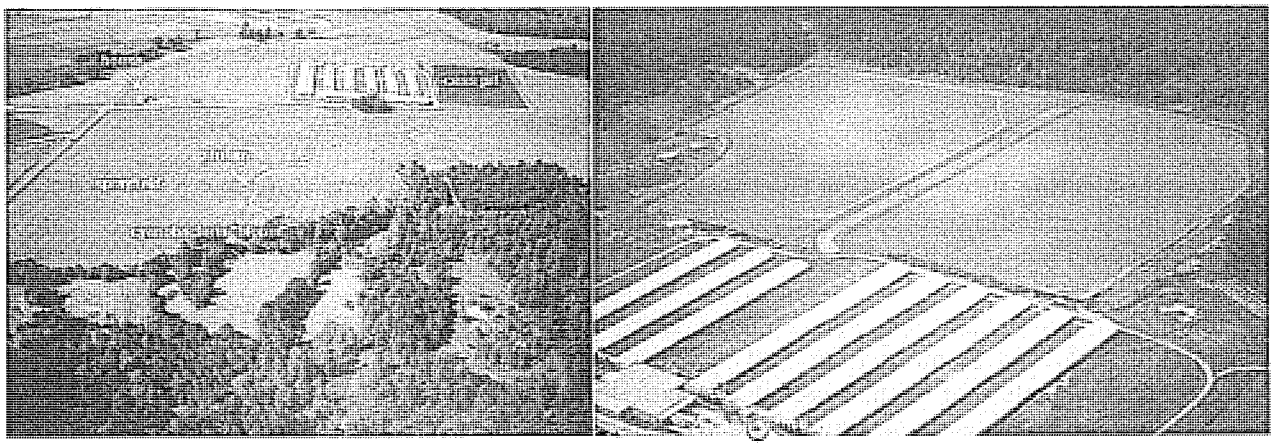

Figure 5. Left: A swine CAFO in the lower Cape Fear River basin, showing (from top to bottom) a house (noted for scale), the buildings that contain about 5,000 animals, the adjacent cess pit, the sprayfield, a stream that has been transformed to a gully conveying wastes from the field into a wetland, and a dense bloom of cyanobacteria (blue-green algae), potentially toxic to humans, that was fueled by the high nutrients in the CAFO wastes (see Burkholder et al. 1997, 2007 for supporting information). Thus, clearly the wastes were moving off-site to contaminate adjacent natural resources. This relatively small field with a shallow layer of soil above the water table, and the cess pit, are "supposed to" adequately treat the liquid wastes, year after year, from 5,000 swine per year, equivalent to the amount of wastes produced by 20,000 people (1 swine produces the equivalent amount of wastes, roughly, of 4 people; see below). Photo: M. Mallin. Right: Two swine CAFO cess pits (the car is circled for scale). The pinkish color is due to anaerobic sulfur bacteria and is suggestive of very high levels of hydrogen sulfide gas, which is toxic to humans (Burkholder et al. 1997, and references therein). Photo: R. Dove, Waterkeeper Alliance.

The general situation was described as follows:

> [CAFO] technology, originally designed for application in upland areas with adequate soil depth above the water table, was embraced in counties where 60-80% of the area put into production was originally low-lying wetlands adjacent to rivers and estuaries. The operations were exempt from land zoning laws and mandatory inspection programs. Waste lagoons were not required to have leakage-reducing liners; some were constructed below the water table less than 20 m [50 feet] from neighboring homes and wells . . . The NC Division of Water

> Quality, charged with water resources management, lacked the personnel and resources necessary to adequately monitor surface or groundwater quality. More fundamentally, the North Carolina Department of Agriculture legally refused to provide the Division of Water Quality with basic data such as the location and number of existing and planned animal operations . . . After considerable effort the North Carolina Environmental Management Commission . . . passed rules in 1993 for design of animal waste lagoons and effluent treatment. These rules mandated use of clay or other suitable liners in future construction of lagoons associated with [CAFOs with] 250 or more swine. They included a grandfather clause to exempt existing operations from having to alter their lagoon design . . ..(Burkholder et al. (1997; references included therein).

The information presented below for airshed, soil and groundwater contamination is included because pollution of those natural resources by swine CAFOs can substantially contribute to surface water contamination, which is the main subject of these Comments regarding the state's classification of the LCFRE segment.

Airshed degradation from swine CAFO point sources

Swine CAFOs emit copious air pollutants known to adversely impact human health and, indirectly, surface waters. For example, ammonia and hydrogen sulfide are emitted at levels toxic to humans (U.S. EPA 1998; also Aneja et al. 2001, Liu et al. 2014). Within a 60-mile radius from where it is emitted, the volatilized ammonia tends to return to the land and surface waters with rain (Aneja et al. 2003), where it can adversely affect river ecosystems (below; e.g. Rothenberger et al. 2009b).

Swine CAFO production in the lower Cape Fear basin has caused a significant increase in air pollutants such as ammonia (Aneja et al. 2003, Wing et al. 2012 and references therein). Surface waters and groundwater are also being adversely impacted; Burkholder et al. (2006) documented a significant increase in ammonia concentrations within the lower Cape Fear River where swine CAFOs are highly concentrated. Cahoon et al. (1999) wrote,

> Aerial deposition of nitrogen, principally ammonia-nitrogen, is recognized as a contributing threat to coastal water quality . . . Some studies estimate that up to 90% of the manure nitrogen produced by swine volatilizes and is deposited downwind [to the land and surface waters] (NC DENR Division of Air Quality 1997).

Sampson County (946 square miles), in the Cape Fear River basin, had 1.8 million swine as of 1998. The National Atmospheric Deposition Program has monitored atmospheric ammonia there since 1978. Mallin (2000) noted that during the 1988-1998 decade, there was a concurrent rise in atmospheric ammonia and the swine population; and that from linear regression analysis, 72% of the variability in airborne ammonia could be explained by changes in the county swine population alone. Upwind in the North Carolina Piedmont, counties with low swine populations showed no ammonia increase during the same period.

Soil degradation from swine CAFO point sources

Swine feed contains metals such as copper act as micronutrients in low concentrations, but

as toxic substances at higher levels. The metals persist in the extremely high amounts of swine wastes (Cahoon et al. 1999; see p.10 of these Comments), which are then applied to fields. Sensitive crops often cannot withdraw the metal in the soil, and leave it behind to accumulate. Research done in eastern North Carolina has explained how waste application contributes to metals pollution in field and, importantly, also has shown that as long ago as the mid-1990s, several counties in the lower Cape Fear River basin could no longer be used to grow metal-sensitive crops and would not need to fertilize with nitrogen or phosphorus for decades (Barker and Zublena 1995, Zublena et al. 1995). Runoff from the contaminated soil during/following precipitation events adds some of these toxic pollutants to adjacent surface waters.

Groundwater degradation from swine CAFO point sources

Areas around the cess pits of swine CAFOs in eastern North Carolina have been shown to receive leakage high in contaminant levels. Wells and subsurface seepage near the cess pits can be contaminated with extremely high levels of nitrate and ammonia (e.g. Huffman and Westerman 1995, Westerman et al. 1995, Ham and DeSutter 2000). The high nitrate levels are a result of the high ammonia levels because the ammonia is oxidized to nitrate as it moves away from the waste sources (see Burkholder et al. 1997, 2007, and references therein). High concentrations of nitrate are hazardous to human health, especially for babies and small children (who can be afflicted with methemoglobinemia or 'blue-baby syndrome'), because nitrate competes with oxygen for hemoglobin in the human bloodstream (Smith 2009, Knobeloch et al. 2010).

Many North Carolinians in the Coastal Plain area rely upon groundwater as their drinking water source (North Carolina Groundwater Association, http://www.ncgwa.org). North Carolina's drinking water standard for nitrate is less than 10 milligrams per liter (mg/L).[5] The available data suggest that many unlined swine effluent cess pits in eastern North Carolina cause nitrate pollution to nearby wells at levels that violate the 10 mg/L drinking water standard (e.g. Huffman 2004, Huffman and Westerman 1995, Westerman et al. 1995). Working in Sampson County within the Cape Fear River basin, Westerman et al.'s (1995, p.1749) study illustrates high contamination from unlined cess pit leakage:

> Two swine manure, anaerobic lagoons located in sandy, coastal plain soil were investigated. Both continued to have significant seepage after 3.5 to 5 years of receiving waste. Monitoring wells indicated *broad seepage plumes* [emphasis added], and much variation in concentrations of several parameters with well location, time, and depth of well . . . In some cases, ammonia and chloride concentrations in well samples were as high or higher than the lagoon liquid.

The last sentence of the above quote is especially of concern - that nearby monitoring wells had ammonia concentrations even higher than the lagoon liquid swine waste. Such

[5] (NC DENR Classifications and Water Quality Standards Applicable to Surface Waters of North Carolina, NC Admin. Code Section 15A NCAC 2B .0200, Environmental Management Commission, Raleigh, NC; http://portal.ncdenr.org/c/document_library/get_file?uuid=ad77b198-aa3d-4874-9723-54ce730b3a8d&groupId=38364).

information points to a major threat to shallow drinking water wells located only short distances, as little as 50 feet, from a swine lagoon cess pit.

Based on the available science literature, substantial groundwater contamination also is contributed by lined cess pits if not properly operated, as described by Westerman et al. (1985, p.1750):

> Ritter and Chirnside (1987) . . . reported high concentrations of NH_3-N and NO_3-N in groundwater monitoring wells near a clay-lined anaerobic lagoon for a hog-finishing unit. Some of the high NH_3-N concentrations were possibly due to lagoon overflow, which occurred several times. They suggested that the lagoon management of completely emptying the lagoon twice a year led to drying and cracking of the clay liner, resulting in seepage. They concluded that if clay-lined lagoons are not operated properly, they will have a serious impact on groundwater quality in loamy sand or sandy loam soils.

Ritter and Chirnside (1990) also reported extreme *average* ammonia-N concentrations, up to 1,000 mg/L, and extreme average nitrate-N up to 50 mg/L, in some wells near a clay-lined swine waste cess pit on the Delmarva Peninsula.

Swine CAFOs (both the land application practices and cess pit leakage) additionally pose a significant threat to well water via contamination by other harmful substances and pathogenic microbes (e.g. Stone et al. 1998, Krapac et al. 2002). Moreover, much lower concentrations of nitrate and ammonia can cause disease and death of beneficial aquatic life in receiving surface waters (see below). During summer low flow conditions on the North Carolina Coastal Plain, at least half of stream and river flow can be contributed by groundwater (Garrett et al. 2012 and references therein). Thus, groundwater contamination by swine CAFOs can contribute significantly to surface water contamination. Cahoon et al. (1999, p.414) wrote,

> An important water quality problem in North Carolina deriving from animal waste inputs is nitrogen loading to surface and groundwaters. Nitrogen frequently limits phytoplankton production in North Carolina's coastal waters, so increased nitrogen loads have stimulated noxious and toxic algal blooms and helped cause fish kills.

Surface water degradation from swine CAFOs

The wastes applied to sprayfields, emitted to the overlying airshed during the spraying activity, or leached into groundwater can make their way into surface waters as explained above. In addition, when the sprayfield soils are saturated with contaminants or with water during moderate to high precipitation periods, or due to over-application, the additional applied wastes rapidly move overland, through tile drains, and through the many ditches in the area to nearby surface waters. Thus, working in eastern North Carolina, Westerman et al. (1985) found high levels of nitrate (3-6 mg/L) in surface runoff from swine CAFO sprayfields that received swine waste effluent ***at recommended rates*** - that is, as a result of routine, accepted practices. For comparison, ~0.1 mg/L of nitrate (and ~0.08

mg/L of phosphorus - below) can cause noxious algal blooms (Mallin 2000, Wetzel 2001, and references therein). Working in Duplin County within the Cape Fear River basin, Stone et al. (1995) measured 6-8 mg of total inorganic nitrogen/L (= nitrate + nitrite + ammonia or ammonium) and 0.7-1.3 mg of phosphorus/L, another important nutrient that can fuel noxious and toxic algal outbreaks (Burkholder 2009), in a stream adjacent to swine effluent sprayfields:

> Mean nitrate-N concentrations of water leaving the [two] watershed outlet[s] were two- and four-times higher than background concentrations . . . Daily mean nitrate-N concentrations [at a tributary adjacent to a swine CAFO] sometimes exceeded 10 mg/L and frequently exceeded 6 mg/L. Over-applied swine lagoon effluent and undersized, overloaded lagoons were likely contributors . . . Mean ammonium-N concentrations . . . were approximately two- and four-times higher than background concentrations. Ammonium-N concentrations [at one watershed outlet] exceeded limits considered harmful to humans (0.5 mg/L) and fish (2.5 mg/L) (U.S. EPA 1973). During the first month of the sampling period, daily ammonium-N concentrations ranged from 6 to 12 mg/L . . . These high concentrations indicated that a significant discharge of animal waste products into the waterway had occurred . . . while storm flows are contributing to the total flux of nitrate-N, the majority of the nitrate-N flux is coming directly from the base flow [in other words, the high contamination occurred with and without precipitation/runoff]. - Stone et al. (1995)

Evans et al. (1984) reported 7-30 mg nitrate/L in subsurface flow draining a sprayfield for swine wastes that were applied at recommended rates:

> The potential for nutrient transport was much greater for subsurface drainage [than for surface drainage] . . . Nitrogen application at the recommended rate resulted in phosphorus application at nearly three times the recommended rate. Although this soil fixes [adsorbs] phosphorus, there was evidence of phosphorus movement in subsurface runoff by the fifth year of waste application at a higher rate. Continued phosphorus application even at the low [recommended] rate would eventually result in movement of P in subsurface runoff as the soil's assimilatory capacity for phosphorus would eventually be exceeded. - Evans et al. (1984)

These reports all describe *excessive* levels of inorganic nitrogen and phosphorus in comparison to what is needed to fuel a noxious or harmful algal outbreak. Evans et al. (1984) highlighted another problem -- that recommended rates of nitrogen application resulted in major excesses of phosphorus that, within a relatively short time, would saturate the soil and contaminate receiving adjacent surface- and ground-waters.

As mentioned, the extremely high nitrate in surface waters and groundwater near swine CAFOs comes from the high ammonia in swine wastes that combines with oxygen. Much lower nitrate levels (0.25-0.28 mg/L) than found in the above-described studies can cause disease and death of beneficial aquatic life (Camargo et al. 2005, Camargo and Alonso 2006). Nitrate can interfere with steroid hormone synthesis, adversely affect sperm

motility and viability, depress fecundity, and can be toxic to embryos (Edwards et al. 2004). It can also decrease immune response, act as an endocrine disruptor, and induce harmful hematological and biochemical changes in beneficial aquatic life (Guillette and Edwards 2005).

Although much of the ammonia which contaminates surface waters from swine CAFOs is oxidized to nitrate, before that occurs the ammonia can cause high toxicity to beneficial aquatic life, or can stimulate noxious algal outbreaks. Ammonia is a preferred form of nitrogen for many algal species including various harmful algae that can cause serious human illness (compiled from Bollos and Berge, Twomy et al. 2005, Herndon and Cochlan 2006, Burkholder 2009). Burkholder et al. (1997) reported ammonia concentrations as high as ~40 mg/L in a stream contaminated by a swine cess pit rupture. Such concentrations can be highly toxic to aquatic life (Camargo et al. 2005, Camargo and Alonso 2006), and would also be expected to stimulate noxious/harmful algal growth as the concentration became more dilute downstream (as was observed by Burkholder et al. 1997 and Mallin et al. 1997).

Swine CAFOs can cause other major surface water impacts from suspended solids loads and turbidity. The water near swine CAFOs is often dark and murky, and inhibits beneficial plant growth (Burkholder et al. 1997, Mallin 2000, and references therein). Swine wastes are acidic (pH ~6.5 - Zu et al. 2001 and references therein) and can impart acidity to receiving surface waters, although the lower mainstem Cape Fear River is well buffered due to the ocean's influence. Toxic levels of metals such as copper occur in runoff from swine effluent sprayfields because copper and other "trace elements" are added to swine feed to promote growth and control disease (Payne et al. 1988). These toxic substances can accumulate in sediments, water, and biota, to levels that are toxic to plants and lead to reproductive impairment, poor body condition, and immune system suppression in beneficial animals (Stubbs and Cathey 1999). Copper from swine and other livestock operations can be added to surface waters via overland discharge and groundwater leachate (U.S. EPA 2013).

Many impacts on surface waters from swine CAFOs are only beginning to be examined. Surface waters in Duplin County, also within the Cape Fear River basin, were recently assessed for fecal indicator bacteria (fecal coliforms, *Escherichia coli*, and *Enterococcus*) and candidate swine-specific microbial source-tracking bacteria over an annual period, both upstream and downstream from swine CAFO sprayfields. The authors noted, importantly, that the proximal "upstream" locations were potentially influenced by numerous upstream swine CAFO sprayfields, and also by poultry CAFO dry litter land application sites. The highest fecal indicator bacteria concentrations were found immediately downstream from swine CAFO sprayfields in spring and summer. The findings were summarized as follows:

> Testing of 187 samples showed high fecal indicator bacteria concentrations at both up- and downstream sites . . . Overall, 40%, 23%, and 61% of samples exceeded state [criteria] and federal recreational water quality guidelines for fecal coliforms, E. coli, and Enterococcus, respectively. Two swine indicator bacteria were 2.30 to 2.47 times as prevalent proximal down- than proximal upstream of swine CAFOs . . . *Results suggest diffuse and overall poor sanitary*

quality of surface waters where swine CAFO density is high [emphasis added].
- Heaney et al. (2015)

The water column of receiving rivers is not the only area affected by CAFO contamination. Burkholder et al. (1997) tracked surface water impacts from a swine cess pit rupture upstream from the New River Estuary near of the Cape Fear River basin. Fecal coliform bacteria densities were in the millions of colony-forming units [CFU] per 100 mL, whereas the state standard for safe human contact of the water is 200 CFU/100 mL. The state does not monitor contamination of bottom sediments by CAFO wastes. After 14 days, water-column fecal coliforms along the surface of the bottom sediments mostly yielded 10,000 CFU/100 mL, one to two orders of magnitude higher than elsewhere in the system. Even after 60 days, fecal bacterial densities in the surficial sediments of the affected area were at 1,000-10,000 CFU/100 mL. The data showed that bottom sediments contaminated by CAFO wastes can function as a repository source of fecal coliform bacteria and, likely, for co-occurring harmful microbes, for weeks to more than a month after a waste spill. The organic materials from the wastes that settled out would have been expected to greatly increase the SOD as well.

Surface waters presently classified as C (Sw) waters in areas draining swine and poultry CAFOs in the lower Cape Fear basin are extremely degraded

There is presently ongoing, persistent, extreme degradation of surface waters in the lower Cape Fear basin due to allowed practices of swine and poultry production. A recent description of a Class C (Sw) stream illustrates this reality:

Stocking Head Creek (8-digit Hydrologic Unit Code 003030007), a second-order tributary of the Northeast Cape Fear River, is presently classified by DWR as Class C (Sw) waters. This small stream (length 13.7 miles) drains 7.6 square miles of area containing 40 swine CAFOs and an estimated 11 poultry CAFOs, with total capacity for more than 94,000 swine and more than 1.3 million broiler chickens; it also includes some unconfined cattle (Mallin et al. 2014). Seven sites along the stream were sampled on 5 dates each in a 30-day period in summer and in fall of 2013. The data indicate a situation of persistent, extreme water quality degradation regardless of weather conditions; the excessive pollutant levels were similar whether the stream was sampled in dry or wet (rainy) periods.

The water quality conditions documented in Stocking Head Creek consistently were hazardous to human health at most stations. Geometric means for fecal coliform bacteria were in the thousands (as colony-forming units per 100 milliliters, CFU/100 mL) at 5 of the 7 sites. The state standard for safe human contact is less than 200 CFU of fecal coliform bacteria/100 mL (geometric mean, based on at least 5 consecutive samples during any 30-day period); and surface waters are supposed to have fewer than 400 CFU of fecal coliform baceria/100 mL in at least 80% of samples examined during the 30-day period. At 5 of the 7 sites on Stocking Head Creek, fecal coliform bacteria exceeded 400 CFU/100 mL on all, or nearly all, sampling dates.

Nutrient levels also demonstrated extreme water quality degradation. Some samples had more than 10 mg of nitrate/L. By comparison, the U.S. EPA (2000) recommends that nitrate should be 0.04 mg/L or less in streams within level III nutrient sub-ecoregion #63,

which includes southeastern North Carolina. The maximum ammonium concentration was 38 mg/L near swine waste sprayfields. BOD (5-day) exceeded 10 mg/L in 11 of 70 stream samples, with a maximum at 88 mg/L. Average total phosphorus (TP) per site ranged from 0.15 to 2.83 mg/L. By comparison, the U.S. EPA (2000) recommends that stream TP concentrations should be less than 0.052 mg/L for streams in this area.

Based on more than 30 years of experience as a water quality specialist, I assess these conditions, ongoing and persistent in this representative stream in the Northeast Cape Fear River basin upstream from the LCFRE segment, as comparable to the filthy conditions that occur just downstream from raw sewage discharge.

Swine CAFO wastes versus the 20 point source wastes and wetlands in the lower Cape Fear basin

Swine wastes are very rich in organic, oxygen-demanding materials in comparison to human wastes. Treated and raw domestic sewage contains ~20-60 mg BOD/L and ~300-400 mg BOD/L, respectively; swine waste slurries contain ~20,000-30,000 mg BOD/L (Webb and Archer 1994; also see Spellman and Whiting 2007). Surface waters contaminated with these wastes rapidly become oxygen-depleted, causing fish to suffocate to death (Burkholder et al. 1997, U.S. EPA 1998, Mallin 2000).

The contribution of oxygen-demanding materials from nearly 1,000 swine CAFO sources, mostly in the lower Cape Fear basin, clearly overwhelms the contribution from the 20 point sources considered by DWR. As stated, about 5 million swine are produced annually in the lower Cape Fear basin in CAFOs (Cahoon et al. 1999). It has been estimated that each animal contributes roughly the equivalent amount of waste -- much richer in oxygen-demanding materials -- of four people (derived from U.S. EPA 2004; see *Table 1* below). The population of the City of Wilmington as of 2014 was ~112,000 people. Overall in the lower Cape Fear basin, the 5 million swine produced per year in CAFOs produce ~179 times more wastes than the largest human population center, Wilmington. Moreover, pound for pound the swine wastes, conservatively estimated, contain about 10 times more oxygen-demanding materials than treated human wastes. Thus, in the lower Cape Fear basin, swine CAFO point sources are estimated to produce three orders of magnitude (~1,790 times) more oxygen-demanding materials than treated human wastes.

These Comments have several times referred to the Northeast Cape Fear River and Black River as having sustained major impacts from swine CAFOs. According to NCDENR (2005), the small sub-watersheds drained by the Northeast Cape Fear River and the Black River, alone, have 896 CAFOS that contain ~3,764,121 animals, roughly the same amount of sewage as more than 15 million people. Stocking Head Creek illustrates the surface water quality of streams draining such areas.

Based on the available information, *the massive contribution of organic-rich, oxygen-demanding materials from swine CAFOs also overwhelms the potential contribution from natural wetlands in the LCFRE.* The sparse available SOD data for the LCFRE (give in Bowen et al. 2009, p.3-20) ranged from 0.1900 to 0.6951 grams of oxygen demand per square meter per day ($g/m^2/day$). The highest values measured were near swine CAFOs, 0.5189 to

Table 1. Manure production per 1,000 pounds (lb) live weight on an annual basis. According to this information from the U.S. EPA (2004, Table 3.3), one 250-lb pig produces 7,250 lb of manure per year (19.86 lb/day), whereas one 150-lb human produces 183 lb of manure/yr (0.5 lb/day). A swine CAFO with 1,000 animals thus would produce about the same amount of waste as a city of 39,617 people. As the U.S. EPA (2004) wrote,

> The important difference lies in the fact that human waste is treated before discharge into the environment, but animal waste is either not treated at all or minimally treated....

It has been argued that swine wastes are about 10-fold more liquid than human wastes; if that dilution factor is taken into account, 1 animal would produce about the same amount of waste of 3.96 people, rounded to a ratio of 1:4.

Manure production per 1000 pounds live weight, on an annual basis.

Animal Species	Manure produced lbs./yr	Typical Handling System
Swine	29.000	Liquid
Poultry		
Broilers	28.000	Solid
Layers	22.000	Liquid
Turkeys	16.000	Solid
Beef	21.000	Solid
Dairy	30.000	Liquid
Humans	1.223[1]	Liquid

[1] Based on 150 lb avg. wt. per person producing 0.5 lb of fecal material per day

0.6951 g/m²/day; even areas near urban Wilmington had lower SOD (0.4440 to 0.4679 g/m²/day). Bowen et al. (p.4-42) used an estimated SOD of ~0.4 g/m²/day except for an area heavily influenced by swine CAFOs, the Northeast Cape Fear River sub-basin, where they used an estimated SOD of 1.5 g/m²/day. This information suggests that the swine CAFO-rich Northeast Cape Fear River alone, contributes excessive SOD in comparison to the rest of the LCFRE, expected since that small sub-watershed contains 502 swine CAFOs with 2,021,000 animals, or the equivalent amount of more than 8 million people's wastes per year (NCDENR 2005).

III. Summary and Recommendations

These Comments have explained the following main points regarding DWR's proposed reclassification of a segment of the LCFRE, from upstream of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut, from Class Sc waters to Class Sc (Sw) (= swamp):

- ✓ NCDENR-DWR has proposed to reclassify the lower reaches of one of the most powerful rivers in the nation, a portion of the LCFRE, as a swamp because the agency's efforts to control the relatively small amount of pollution from 20 point sources will not allow that segment to meet present standard for DO (or for pH, turbidity, and toxic copper). This was based on a recent modeling effort (Bowen et al. 2009) which predicted that

the 20 arbitrarily selected point sources have little effect on DO levels in the LCFRE segment. In addition, the segment was described as inappropriate for development of a TMDL, based on two erroneous claims -- that natural wetland drainage is the major contributor of oxygen-demanding materials to the LCFRE segment, and that significant reductions in "background" sources of oxygen-demanding materials would not allow the LCFRE segment to meet the present DO standard.

- ✓ According to the U.S. EPA, assessment of whether a TMDL is needed to improve DO in the LCFRE segment is supposed to consider all point and nonpoint sources in the watershed. In focusing on only 20 point sources, DWR omitted consideration of massive pollution that could be reduced in the so-called "background" loads, including 175 NPDES-permitted, upstream and adjacent point sources in the Cape Fear River basin, and nearly 1,000 swine CAFOs (as well as an unknown number of poultry CAFOs) which are formally defined by the Clean Water Act as point sources. The ~5 million swine produced in the lower Cape Fear River basin contribute the equivalent of ~20 million people's wastes per year, and the massive wastes are much richer in oxygen-demanding materials than human wastes.

- ✓ The available evidence shows that pollution from human activities, not natural drainage from wetlands, is the major source of oxygen-demanding materials to the LCFRE segment, and that the massive pollution also contributes low pH, toxic copper, high turbidity, fecal bacteria, and many other contaminants to the LCFRE segment.

- ✓ The recent modeling effort by Bowen et al. (2009) tacitly included the many other NPDES-permitted point sources and swine/poultry CAFOs within a modeling category called "tributary inputs." The model predicted that a reduction of only 30% of the "tributary inputs" would result in median DO levels higher than the state standard; and that a 70% reduction in the "tributary inputs" would bring the LCFRE into compliance 99% of the time. Thus, reducing the massive pollution from other sources **would** enable the LCFRE segment to attain compliance with its present DO standard.

To protect the health of many North Carolinians of all ages who depend upon this river and estuary to meet its present designated uses, and to protect the LCFRE surface water segment of focus as well as other public trust natural resources in the lower Cape Fear basin, the LCFRE segment should not be reclassified as a Class Sc Swamp (Sw). Instead, DWR should be directed toward efforts to meaningfully reduce the massive pollution from swine_CAFOs and NPDES-permitted point sources in the lower Cape Fear Basin (and from poultry production as well, which are a major pollution source with much less available information), which would make it possible for the LCFRE to meet the presently pplicable DO standard, and would also enable the LCFRE to improve in water quality with respect to pH, copper levels, and turbidity.

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JoAnn M. Burkholder

JoAnn M. Burkholder, Ph.D.

Exhibit D

Water Resources
Environmental Quality

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Interim Director

April 9, 2018

Mr. Trey Glenn, Regional Administrator
Environmental Protection Agency, Region 4
61 Forsyth Street SW
Atlanta, GA 30303

SUBJECT: Request for Approval of Modifications to North Carolina's Surface Water Quality Classifications

Dear Mr. Glenn:

In accordance with the provisions of Section 303 of the Clean Water Act, I am submitting North Carolina's formal request for review and approval of select revisions to the Surface Water Quality Standards and Stream Classifications rules that became effective in 2017. These revisions pertain to the reclassification of a segment of the Cape Fear River, and are part of the state's Triennial Review of Classifications and Standards.

The reclassification from Class SC to Class SC Sw was based on scientific information provided by the requestor as well as information available to North Carolina's Division of Water Resources staff. This information included documents such as:

- "The Relationship of Adjacent Wetlands and Salt Marsh to Dissolved Oxygen in the Lower Cape Fear River Estuary" (Tetra Tech, 2014)
- "Analysis of Water Quality Data at Cape River Estuary Model Boundaries" and "Summary of Background Information and Previous Studies for the Lower Cape Fear River" (CH_2MHill, 2014)
- "Development and Use of a Three-Dimensional Water Quality Model to Predict Dissolved Oxygen Concentrations in the Lower Cape Fear River Estuary, North Carolina" (Bowen, et al., 2009)
- "The Potential Impacts of Climate Change on Coastal North Carolina" (University of North Carolina Wilmington, 2008)

Standards applicable to Class SC waters, which include the subject waters, provide a base of protection to all North Carolina's tidal salt waters. The supplemental Sw classification recognizes natural conditions, most notably for pH and DO. Thus, additional ambient DO & pH standards apply in the subject waters under natural conditions. This proposal recognizes the inputs and effects of the majority of waters that drain into subject waters, which are also classified as Sw.

To aid the review, a water quality management plan is included for the subject waters that proceeded through rulemaking with the reclassification. The water quality management plan is consistent with and helps to implement the permitting strategy in place for new individual NPDES wastewater discharges and expansions of existing individual NPDES wastewater discharges to the subject waters. The management plan contains effluent limits that new individual NPDES wastewater discharges and expansions of existing individual NPDES wastewater discharges within

the river segment must meet regarding oxygen consuming wastes as of the effective date of the rule. These limits are more stringent than the standards regarding oxygen consuming wastes for Class SC or Class Sw waters, and are very similar to the limits for one of the state's most restrictive supplemental classifications, High Quality Waters.

Discharge Effluent Limit	Before Reclassification	After Reclassification[1]
BOD_5	≥1 MGD = 5 mg/l < 1 MGD = 5 mg/l	5 mg/l
Ammonia Nitrogen	≥ 1 MGD = 1 mg/l < 1 MGD = 2 mg/l	1 mg/l
DO	5 mg/l	6 mg/l
In-stream delta DO	< 0.5 mg/l [2]	< 0.1 mg/l [3]

1. For industrial discharges, site-specific best available technology on a case-by-case basis would be utilized to determine the limits for BOD5, Ammonia and DO according to 15A NCAC 02B .0406(e).
2. HQW rules require more stringent limits if in-stream DO drops more than 0.5 mg/l.
3. The in-stream DO is not to drop more than 0.1 mg/l below the modeled in-stream DO at total permitted capacity for all discharges.

A complete listing of the enclosures submitted as part of this package is enclosed, including a map that indicates all of the upstream waters that are already supplementally classified with the Sw classification. A letter of opinion from our Attorney General certifying that the revised rule was adopted following public hearing and that the revisions are valid and enforceable in the State of North Carolina is included as Enclosure 4.

We believe the reclassification included in this package meets the requirements of the Clean Water Act. If there are any questions during the review, please feel free to contact Elizabeth Kountis at (919) 807-6418.

Sincerely,

Linda Culpepper
Interim Director, Division of Water Resources

TR:EK

Enclosures

cc: Annie Godfrey (EPA)
Tom Fransen (DWR)

List of Enclosures

Enclosure 1.
Summary of North Carolina
Surface Water Quality Reclassification
Effective on June 30, 2017

Summary of North Carolina Surface Water Quality Reclassification Effective June 30, 2017

On June 30, 2017, one surface water reclassification became effective (see Table 1).

Table 1. Surface Water Reclassification That Became Effective on June 30, 2017

Waterbody	River Basin	County	Class Change From	Class Change To	Public Hearing	EMC Final Action	Effective Date
Cape Fear River	Cape Fear	New Hanover, Brunswick	SC	SC Sw (with a water quality management plan)	02/05/15	09/10/15 (and 05/12/16)	June 30, 2017

The chemical, physical, and biological properties; character of the watershed and bordering areas; economic effects; and past, present, and future uses of the watershed were considered when determining the appropriate class for this reclassification.

The most common and basic classification for tidal salt water is Class SC. Class SC waters are protected for aquatic life propagation and maintenance of biological integrity (including fishing and fish), wildlife, secondary recreation and any other usages except for primary recreation or shellfishing. All tidal salt waters of the state are at least protected for Class SC uses.

The SC classification is a primary classification whereas the Sw classification is a supplemental classification that can accompany a primary classification. Sw waters are waters that are topographically located so as to generally have natural characteristics such as low velocity, dissolved oxygen, or pH, which are different from streams draining steeper topography.

A water quality management plan is a strategy tailored to protect existing uses or quality of waters in specific waters. “In implementing the water quality standards to protect the existing uses…of the waters of the state or the water quality which supports those uses, the Commission shall develop water quality management plans on a priority basis to attain, maintain or enhance water quality throughout the state” (15A NCAC 02B .0227).

The reclassification submitted for approval involves a portion of the lower Cape Fear River reclassified from SC to SC Sw. The main segment of the Cape Fear River directly above the reclassified river segment is classified C Sw, and the largest tributary to the subject waters, which is located immediately upstream of the subject waters, is the Northeast Cape Fear River and is classified SC Sw. The majority of the named waters flowing into the subject waters already carry the Sw designation, and this proposal recognizes the inputs and effects of all Sw waters that drain into subject waters. The highly flushed portion of the lower segment of the Cape Fear Rives is not included in this reclassification (see attached map).

Standards applicable to Class SC waters, which include the subject waters, provide a base of protection to all North Carolina’s tidal salt waters. The supplemental Sw classification

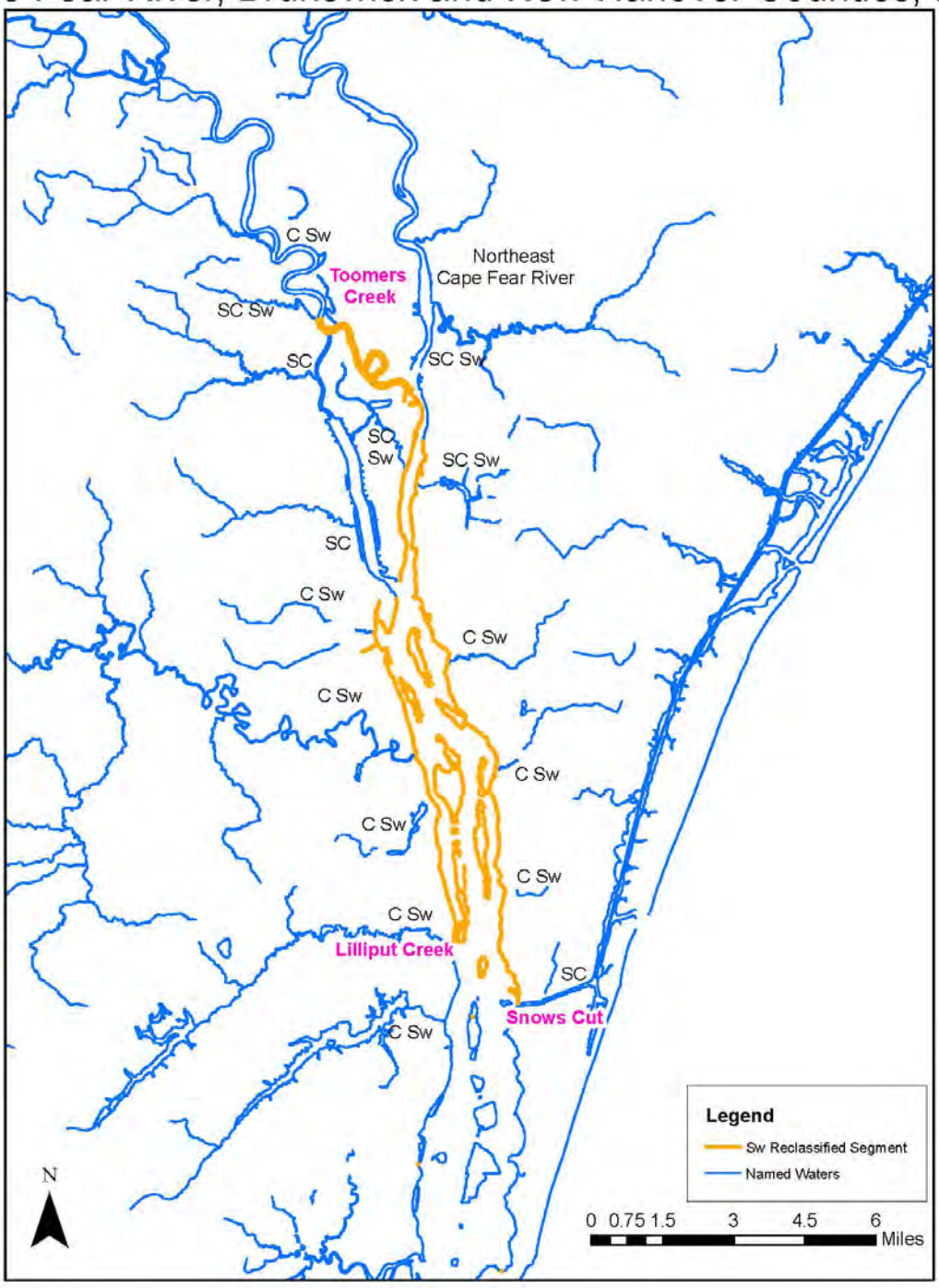
recognizes natural conditions, most notably for pH and DO. Thus, additional ambient DO & pH standards apply in the subject waters under natural conditions.

For your information, a water quality management plan is included for the subject waters that proceeded through rulemaking with the Sw reclassification. The water quality management plan is consistent with and helps to implement the current permitting strategy already in place for new individual NPDES wastewater discharges and expansions of existing individual NPDES wastewater discharges to the subject waters, which is designed to address water quality and existing uses of these waters. The management plan contains effluent limits that new individual NPDES wastewater discharges and expansions of existing individual NPDES wastewater discharges within the river segment must meet regarding oxygen consuming wastes. These limits are more stringent than the standards regarding oxygen consuming wastes for Class SC or Class Sw waters.

The reclassification in conjunction with the management plan aid existing and future communities and the above-mentioned NPDES facilities in this area in preparing for the future. The management plan informs these communities and facilities about what to expect in terms of permitting, thus providing a path forward for future planning purposes.

A "Report of Proceedings" as well as an addendum to that document for the above-mentioned reclassification can be accessed at http://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/current-reclassification-proposals

Swamp Reclassification and Water Quality Management Plan
Cape Fear River, Brunswick and New Hanover Counties, NC



Enclosure 2.
Schedule of Classifications
as Amended on June 30, 2017

Reference Material to Regulation 15A 2B .0311 Cape Fear River Basin, entitled CLASSIFICATIONS AND WATER QUALITY STANDARDS ASSIGNED TO THE WATERS OF THE CAPE FEAR RIVER BASIN, has been amended 6-30-2017 as follows:

Name of Stream	***Description***	***Class***	***Stream Index #***
Cape Fear River	From upstream mouth of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut	SC Sw	18-(85.5)

Enclosure 3.
Records of Rule-Making for Reclassification

file
5/19/16

SUBMISSION FOR PERMANENT RULE

1. Rule-Making Agency: Environmental Management Commission (EMC)

2. Rule citation & name (name not required for repeal):
15A NCAC 02B .0227 Water Quality Management Plans

3. Action:
☐ ADOPTION ☒ AMENDMENT ☐ REPEAL ☐ READOPTION

4. Rule exempt from RRC review?
☐ Yes. Cite authority:
☒ No

5. Rule automatically subject to legislative review?
☐ Yes. Cite authority:
☒ No

FILED
2016 MAY 19 AM 9:45
OFFICE OF ADMIN HEARINGS

6. Notice for Proposed Rule:
☒ Notice Required
Notice of Text published on: December 15, 2015
Link to Agency notice: http://portal.ncdenr.org/web/wq/rules
Hearing on: No hearing held
Adoption by Agency on: May 12, 2016
☐ Notice not required under G.S.:
Adoption by Agency on:

7. Rule establishes or increases a fee? (See G.S. 12-3.1)
☐ Yes
Agency submitted request for consultation on:
Consultation not required. Cite authority:
☒ No

8. Fiscal impact (check all that apply):
☐ State funds affected
☐ Environmental permitting of DOT affected and analysis submitted to Board of Transportation
☐ Local funds affected
☐ Substantial economic impact (≥$1,000,000)
☐ Approved by OSBM
☒ No fiscal note required

9. REASON FOR ACTION

9A. What prompted this action? Check all that apply:
☒ Agency
☐ Court order / cite:
☐ Federal statute / cite:
☐ Federal regulation / cite:
☐ Legislation enacted by the General Assembly
Cite Session Law:
☐ Petition for rule-making
☐ Other:

9B. Explain:
At the September 2015 EMC meeting, the EMC approved rule amendments reflecting the reclassification of a portion of the Cape Fear River in New Hanover and Brunswick Counties to Class SC Sw with a water quality management plan. The rulemaking involved proposed amendments to 15A NCAC 2B .0227 and .0311 that had been publicly noticed in early 2015 and adopted in conjunction with each other. Then the Division of Water Resources (DWR) submitted the rule amendments to the RRC, and RRC counsel requested technical changes to 2B .0227 but not 2B .0311. DWR responded to the requested technical changes with a revised version of 2B .0227 that EMC approved at its November 2015 meeting to go out to public notice unaccompanied by 2B .0311. A 60-day public notice period was held from December 15, 2015 – February 15, 2016, and EMC adopted revisions to 2B .0227 on May 12, 2016.

10. Rule-making Coordinator: Jennifer Everett
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Agency Contact, if any: Elizabeth Kountis
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11. Signature of Agency Head* or Rule-making Coordinator:
Jennifer L Everett

*If this function has been delegated (reassigned) pursuant to G.S. 143B-10(a), submit a copy of the delegation with this form.

Typed Name: Jennifer Everett
Title: Rule-making Coordinator

RRC AND OAH USE ONLY

Action taken:
☐ RRC extended period of review:
☐ RRC determined substantial changes:
☐ Withdrawn by agency
☐ Subject to Legislative Review
☐ Other:

file
6/2/16

FILED

15A NCAC 02B .0227 has been amended with changes as published in 30:12 NCR 1277-1278 as follows:

2016 JUN -2 PM 12: 35

15A NCAC 02B .0227 WATER QUALITY MANAGEMENT PLANS

OFFICE OF ADMIN HEARINGS

(a) In implementing the water quality standards to protect the ~~existing uses~~ "existing uses" [as defined by Rule .0202 of this Section] of the waters of the state or the water quality ~~which~~ that supports those uses, the Commission shall develop water quality management plans on a priority basis to attain, maintain or enhance water quality throughout the state. Additional specific actions deemed necessary by the Commission to protect the water quality or the existing uses of the waters of the state shall be specified in Paragraph (b) of this Rule. These actions may include anything within the powers of the Commission. The Commission may also consider local actions ~~which~~ that have been taken to protect a waterbody in determining the appropriate protection options to be incorporated into the water quality management plan.

(b) All waters determined by the Commission to be protected by a water quality management plan are listed with specific actions either in Rules .0601- .0608 of this Subchapter that address the Goose Creek watershed (Yadkin Pee-Dee River Basin) or as follows:

(1) The Lockwoods Folly River Area (Lumber River Basin), which includes all waters of the lower Lockwoods Folly River in an area extending north from the Intracoastal Waterway to a line extending from Genoes Point to Mullet Creek, shall be protected by the specific actions described in Parts (A) through ~~(E)~~ (D) of this Subparagraph.

(A) New development activities within 575' of the mean high water line ~~which~~ that require a Sedimentation Erosion Control Plan or a CAMA major development permit ~~must~~ shall comply with the low density option of the coastal ~~Stormwater~~ stormwater ~~Runoff Disposal Rules~~ requirements ~~[as specified in 15A NCAC 2H .1005(2)(a)]~~. as specified in 15A NCAC 2H ~~.1005(2)(a)~~ .1005(3)(a).

(B) New or expanded NPDES permits shall be issued only for non-domestic, non-industrial process type discharges ~~(such as non industrial process cooling or seafood processing discharges).~~ such as non-industrial process cooling or seafood processing discharges. A public hearing ~~is~~ shall be mandatory for any proposed (new or expanded) NPDES permit to this protected area.

~~(C) New non discharge permits shall be required to meet reduced loading rates and increased buffer zones, to be determined on a case by case basis.~~

~~(D)~~(C) New or expanded marinas ~~must~~ shall be located in upland basin areas.

~~(E)~~(D) No dredge or fill activities shall be allowed ~~where significant shellfish or submerged aquatic vegetation bed resources occur~~, if those activities would result in a reduction of the beds of ~~submerged~~ "submerged aquatic vegetation [~~habitat~~] habitat" or [~~a reduction of shellfish~~] "shellfish producing habitat" [~~habitat as which~~] that are defined in [~~15A NCAC 03I .0101(b)(20)(A) and (B),~~] 15A NCAC 03I .0101, except for maintenance dredging, such as that required to maintain access to existing channels and facilities located within the protected area or maintenance dredging for activities such as agriculture.

(2) A part of the Cape Fear River (Cape Fear River Basin) comprised of a section of Index No.18-(71) from upstream mouth of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut shall be protected by the Class SC Sw standards as well as the following site-specific action: All new individual NPDES wastewater discharges and expansions of existing individual NPDES wastewater discharges shall be required to provide treatment for oxygen consuming wastes as described in Parts (A) through (C) of this Subparagraph.

(A) Effluent limitations shall be as follows: BOD_5 = 5 mg/l, NH_3-N = 1 mg/l and DO = 6 mg/l, or utilize site-specific best available technology on a case-by-case basis for industrial ~~discharges~~.discharges in accordance with Rule .0406 (e) of this Subchapter.

(B) Seasonal effluent limits for oxygen consuming wastes [~~will~~] shall be considered ~~on a case-by-case basis~~ in accordance with Rule .0404 of this Subchapter.

(C) Any new or expanded permitted pollutant discharge of oxygen consuming waste shall not cause the dissolved oxygen of the receiving water to drop more than 0.1 mg/l below the modeled in-stream dissolved oxygen at total permitted capacity for all discharges.

History Note: *Authority G.S. 143-214.1; 143-215.8A;*
Eff. October 1, 1995;
Amended Eff. ~~November 1, 2015;~~ July 1, 2016; January 1, 1996.

file
6/14/16

SUBMISSION FOR PERMANENT RULE

1. Rule-Making Agency: Environmental Management Commission

2. Rule citation & name (name not required for repeal): 15A NCAC 02B .0311 Cape Fear River Basin

3. Action:
☐ ADOPTION ☒ AMENDMENT ☐ REPEAL

FILED
2016 JUN 14 AM 11:49
OFFICE OF ADMIN HEARINGS

4. Rule exempt from RRC review?
☐ Yes. Cite authority:
☒ No

5. Rule automatically subject to legislative review?
☐ Yes. Cite authority:
☒ No

6. Notice for Proposed Rule:
☒ Notice Required
Notice of Text published on: January 2, 2015
Link to Agency notice: http://portal.ncdenr.org/web/wq/rules
Hearing on: February 5, 2015
Adoption by agency on: September 10, 2015
☐ Notice not required under G.S.:
Adoption by agency on:

7. Rule establishes or increases a fee? (See G.S. 12-3.1)
☐ Yes
Agency submitted request for consultation on:
Consultation not required. Cite authority:
☒ No

8. Fiscal impact (check all that apply):
☐ State funds affected
☐ Environmental permitting of DOT affected and analysis submitted to Board of Transportation
☐ Local funds affected
☐ Substantial economic impact (≥$1,000,000)
☐ Approved by OSBM
☒ No fiscal note required

9. REASON FOR ACTION

9A. What prompted this action? Check all that apply:
☒ Agency
☐ Court order / cite:
☐ Federal statute / cite:
☐ Federal regulation / cite:
☐ Legislation enacted by the General Assembly
Cite Session Law:
☐ Petition for rule-making
☐ Other:

9B. Explain: Lower Cape Fear River Program staff requested that a section of the Cape Fear River in Brunswick and New Hanover Counties be reclassified. The subject waters are proposed to be reclassified from Class SC to Class SC Sw with a water quality management plan (WQMP). The proposed Sw reclassification would allow, if caused by natural conditions, the pH of the subject waters to reach as low as 4.3 (compared to the currently required 6.8-8.5 range) and the dissolved oxygen to be lower than the currently required 5 mg/l. The proposed WQMP would help implement the current permiting strategy for new individual NPDES wastewater discharges and expansions of existing individual NPDES wastewater discharges to the subject waters. The overall proposal provides a path forward for these discharges & local communities for future planning purposes.

10. Rule-making Coordinator: Jennifer Everett
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Agency Contact, if any: Elizabeth Kountis
Phone: (919)807-6418
E-Mail: elizabeth.kountis@ncdenr.gov

11. Signature of Agency Head* or Rule-making Coordinator:
Jennifer L Everett

*If this function has been delegated (reassigned) pursuant to G.S. 143B-10(a), submit a copy of the delegation with this form.

Typed Name: Jennifer Everett
Title: Rule-making Coordinator

RRC AND OAH USE ONLY

Action taken:

☐ RRC Extended period of review:
☐ RRC determined substantial changes:
☐ Withdrawn by agency
☐ Subject to Legislative Review
☐ Other:

15A NCAC 02B .0311 has been amended <u>with changes</u> as published in 29:13 NCR 1606-1609 as follows:

15A NCAC 02B .0311 CAPE FEAR RIVER BASIN

(a) Effective February 1, 1976, the adopted classifications assigned to the waters within the Cape Fear River Basin are set forth in the Cape Fear River Basin Schedule of Classifications and Water Quality Standards, which may be inspected at the following places:

(1) the Internet at http://portal.ncdenr.org/web/wq/ps/csu/rules; and

(2) the North Carolina Department of Environment and Natural Resources:

(A) Winston-Salem Regional Office
585 Waughtown Street
Winston-Salem, North Carolina

(B) Fayetteville Regional Office
225 Green Street
Systel Building Suite 714
Fayetteville, North Carolina

(C) Raleigh Regional Office
3800 Barrett Drive
Raleigh, North Carolina

(D) Washington Regional Office
943 Washington Square Mall
Washington, North Carolina

(E) Wilmington Regional Office
127 Cardinal Drive Extension
Wilmington, North Carolina

(F) Division of Water Quality
Central Office
512 North Salisbury Street
Raleigh, North Carolina.

(b) The Cape Fear River Basin Schedule of Classification and Water Quality Standards was amended effective:

(1) March 1, 1977;

(2) December 13, 1979;

(3) December 14, 1980;

(4) August 9, 1981;

(5) April 1, 1982;

(6) December 1, 1983;

(7) January 1, 1985;

(8) August 1, 1985;

(9) December 1, 1985;

(10) February 1, 1986;

(11) July 1, 1987;

(12) October 1, 1987;

(13) March 1, 1988;

(14) August 1, 1990.

(c) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective June 1, 1988 as follows:

(1) Cane Creek [Index No. 16-21-(1)] from source to a point 0.5 mile north of N.C. Hwy. 54 (Cane Reservoir Dam) including the Cane Creek Reservoir and all tributaries has been reclassified from Class WS-III to WS-I.

(2) Morgan Creek [Index No. 16-41-1-(1)] to the University Lake dam including University Lake and all tributaries has been reclassified from Class WS-III to WS-I.

(d) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective July 1, 1988 by the reclassification of Crane Creek (Crains Creek) [Index No. 18-23-16-(1)] from source to mouth of Beaver Creek including all tributaries from C to WS-III.

(e) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective January 1, 1990 as follows:

(1) Intracoastal Waterway (Index No. 18-87) from southern edge of White Oak River Basin to western end of Permuda Island (a line from Morris Landing to Atlantic Ocean), from the eastern mouth of Old Topsail Creek to the southwestern shore of Howe Creek and from the southwest mouth of Shinn Creek to channel marker No. 153 including all tributaries except the King Creek Restricted Area, Hardison Creek, Old Topsail Creek, Mill Creek, Futch Creek and Pages Creek were reclassified from Class SA to Class SA ORW.

(2) Topsail Sound and Middle Sound ORW Area which includes all waters between the Barrier Islands and the Intracoastal Waterway located between a line running from the western most shore of Mason Inlet to the southwestern shore of Howe Creek and a line running from the western shore of New Topsail Inlet to the eastern mouth of Old Topsail Creek was reclassified from Class SA to Class SA ORW.

(3) Masonboro Sound ORW Area which includes all waters between the Barrier Islands and the mainland from a line running from the southwest mouth of Shinn Creek at the Intracoastal Waterway to the southern shore of Masonboro Inlet and a line running from the Intracoastal Waterway Channel marker No. 153 to the southside of the Carolina Beach Inlet was reclassified from Class SA to Class SA ORW.

(f) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective January 1, 1990 as follows: Big Alamance Creek [Index No. 16-19-(1)] from source to Lake Mackintosh Dam including all tributaries has been reclassified from Class WS-III NSW to Class WS-II NSW.

(g) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective August 3, 1992 with the reclassification of all water supply waters (waters with a primary classification of WS-I, WS-II or WS-III). These waters were reclassified to WS-I, WS-II, WS-III, WS-IV or WS-V as defined in the revised water supply protection rules, (15A NCAC 02B .0100, .0200 and .0300) which became effective on August 3, 1992. In some cases, streams with primary classifications other than WS were reclassified to a WS classification due to their proximity and linkage to water supply waters. In other cases, waters were reclassified from a WS classification to an alternate appropriate primary classification after being identified as downstream of a water supply intake or identified as not being used for water supply purposes.

(h) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective June 1, 1994 as follows:

(1) The Black River from its source to the Cape Fear River [Index Nos. 18-68-(0.5), 18-68-(3.5) and 18-65-(11.5)] was reclassified from Classes C Sw and C Sw HQW to Class C Sw ORW.

(2) The South River from Big Swamp to the Black River [Index Nos. 18-68-12-(0.5) and 18-68-12(11.5)] was reclassified from Classes C Sw and C Sw HQW to Class C Sw ORW.

(3) Six Runs Creek from Quewhiffle Swamp to the Black River [Index No. 18-68-2] was reclassified from Class C Sw to Class C Sw ORW.

(i) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective September 1, 1994 with the reclassification of the Deep River [Index No. 17-(36.5)] from the Town of Gulf-Goldston water supply intake to US highway 421 including associated tributaries from Class C to Classes C, WS-IV and WS-IV CA.

(j) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective August 1, 1998 with the revision to the primary classification for portions of the Deep River [Index No. 17-(28.5)] from Class WS-IV to Class WS-V, Deep River [Index No. 17-(41.5)] from Class WS-IV to Class C, and the Cape Fear River [Index 18-(10.5)] from Class WS-IV to Class WS-V.

(k) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective April 1, 1999 with the reclassification of Buckhorn Creek (Harris Lake)[Index No. 18-7-(3)] from the backwaters of Harris Lake to the Dam at Harris Lake from Class C to Class WS-V.

(l) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective April 1, 1999 with the reclassification of the Deep River [Index No. 17-(4)] from the dam at Oakdale-Cotton Mills, Inc. to the dam at Randleman Reservoir (located 1.6 mile upstream of U.S. Hwy 220 Business), and including tributaries from Class C and Class B to Class WS-IV and Class WS-IV & B. Streams within the Randleman Reservoir Critical Area have been reclassified to WS-IV CA. The Critical Area for a WS-IV reservoir is defined as 0.5 mile and draining to the normal pool elevation of the reservoir. All waters within the Randleman Reservoir Water Supply Watershed are within a designated Critical Water Supply Watershed and are subject to a special management strategy specified in 15A NCAC 02B .0248.

(m) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective August 1, 2002 as follows:

(1) Mill Creek [Index Nos. 18-23-11-(1), 18-23-11-(2), 18-23-11-3, 18-23-11-(5)] from its source to the Little River, including all tributaries was reclassified from Class WS-III NSW and Class WS-III B NSW to Class WS-III NSW HQW@ and Class WS-III B NSW HQW@.

(2) McDeed's Creek [Index Nos. 18-23-11-4, 18-23-11-4-1] from its source to Mill Creek, including all tributaries was reclassified from Class WS III NSW and Class WS-III B NSW to Class WS-III NSW HQW@ and Class WS-III B NSW HQW@.

The "@" symbol as used in this Paragraph means that if the governing municipality has deemed that a development is covered under a "5/70 provision" as described in Rule 15A NCAC 02B .0215(3)(b)(i)(E) (Fresh Surface Water Quality Standards for Class WS-III Waters), then that development is not subject to the stormwater requirements as described in rule 15A NCAC 02H .1006 (Stormwater Requirements: High Quality Waters).

(n) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective November 1, 2004 as follows:

(1) the portion of Rocky River [Index Number 17-43-(1)] from a point 0.3 mile upstream of Town of Siler City upper reservoir dam to a point 0.3 mile downstream of Lacy Creek from WS-III to WS-III CA.

(2) the portion of Rocky River [Index Number 17-43-(8)] from dam at lower water supply reservoir for Town of Siler City to a point 65 feet below dam (site of proposed dam) from C to WS-III CA.

(3) the portion of Mud Lick Creek (Index No. 17-43-6) from a point 0.4 mile upstream of Chatham County SR 1355 to Town of Siler City lower water supply reservoir from WS-III to WS-III CA.

(4) the portion of Lacy Creek (17-43-7) from a point 0.6 mile downstream of Chatham County SR 1362 to Town of Siler City lower water supply reservoir from WS-III to WS-III CA.

(o) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective November 1, 2007 with the reclassifications listed below, and the North Carolina Division of Water Quality maintains a Geographic Information Systems data layer of these UWLs.

(1) Military Ocean Terminal Sunny Point Pools, all on the eastern shore of the Cape Fear River [Index No. 18-(71)] were reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.

(2) Salters Lake Bay near Salters Lake [Index No. 18-44-4] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.

(3) Jones Lake Bay near Jones Lake [Index No. 18-46-7-1] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.

(4) Weymouth Woods Sandhill Seep near Mill Creek [18-23-11-(1)] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.

(5) Fly Trap Savanna near Cape Fear River [Index No. 18-(71)] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.

(6) Lily Pond near Cape Fear River [Index No. 18-(71)] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.

(7) Grassy Pond near Cape Fear River [Index No. 18-(71)] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.

(8) The Neck Savanna near Sandy Run Swamp [Index No. 18-74-33-2] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.

(9) Bower's Bog near Mill Creek [Index No. 18-23-11-(1)] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.

(10) Bushy Lake near Turnbull Creek [Index No. 18-46] was reclassified to Class WL UWL as defined in 15A NCAC 02B .0101.

(p) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective January 1, 2009 as follows:

(1) the portion of Cape Fear River [Index No. 18-(26)] (including tributaries) from Smithfield Packing Company's intake, located approximately 2 miles upstream of County Road 1316, to a point 0.5 miles upstream of Smithfield Packing Company's intake from Class C to Class WS-IV CA.

(2) the portion of Cape Fear River [Index No.18-(26)] (including tributaries) from a point 0.5 miles upstream of Smithfield Packing Company's intake to a point 1 mile upstream of Grays Creek from Class C to Class WS-IV.

(q) The schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective August 11, 2009 with the reclassification of all Class C NSW waters and all Class B NSW waters upstream of the dam at B. Everett Jordan Reservoir from Class C NSW and Class B NSW to Class WS-V NSW and Class WS-V & B NSW, respectively. All waters within the B. Everett Jordan Reservoir Watershed are within a designated Critical Water Supply Watershed and are subject to a special management strategy specified in 15A NCAC 02B .0262 through .0273.

(r) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective September 1, 2009 with the reclassification of a portion of the Haw River [Index No. 16-(28.5)] from the Town of Pittsboro water supply intake, which is located approximately 0.15 mile west of U.S. 15/501, to a point 0.5 mile upstream of the Town of Pittsboro water supply intake from Class WS-IV to Class WS-IV CA.

(s) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective March 1, 2012 with the reclassification of the portion of the Haw River [Index No. 16-(1)] from the City of Greensboro's intake, located approximately 650 feet upstream of Guilford County 2712, to a point 0.5 miles upstream of the intake from Class WS-V NSW to Class WS-IV CA NSW, and the portion of the Haw River [Index No. 16-(1)] from a point 0.5 miles upstream of the intake to a point 0.6 miles downstream of U.S. Route 29 from Class WS-V NSW to Class WS-IV NSW.

(t) The Schedule of Classifications and Water Quality Standards for the Cape Fear River Basin was amended effective [~~November 1, 2015~~] August 1, 2016 with the reclassification of a section of 18-(71) from upstream mouth of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut from Class SC to Class SC Sw. A site-specific management strategy is outlined in 15A NCAC 02B .0227.

History Note: *Authority G.S. 143-214.1; 143-215.1; 143-215.3(a)(1);*
Eff. February 1, 1976;
Amended Eff. August 1, 2016; March 1, 2012; September 1, 2009; August 11, 2009; January 1, 2009; November 1, 2007; November 1, 2004; August 1, 2002; April 1, 1999; August 1, 1998; September 1, 1994; June 1, 1994; August 3, 1992; August 1, 1990.

Enclosure 4.
Attorney General's Certification

JOSH STEIN
ATTORNEY GENERAL

Reply To:
Daniel S. Hirschman
Environmental Division
Phone: (919) 716-6600
dhirschman@ncdoj.gov

March 28, 2018

Ms. Anne Heard, Acting Regional Administrator
Environmental Protection Agency, Region IV
61 Forsyth Street SW
Atlanta, GA 30303

SUBJECT: Certification of Adoption of Modifications to North Carolina's Surface Water Quality Classifications

Dear Ms. Heard:

Under the provisions of Article 21, Chapter 143 of the North Carolina General Statutes as amended, the North Carolina Environmental Management Commission is directed and empowered to adopt and assign "best use" classifications to all the surface waters of the State and to adopt water quality standards applicable to each classification.

The North Carolina Environmental Management Commission, after notice duly given, has adopted modifications to surface water classifications. The modifications to surface water classifications are shown in the enclosed *"Table 1. Surface Water Reclassification That Became Effective on June 30, 2017."*

By delegation from the Attorney General of North Carolina, I advise you that it is my opinion that the revised stream classifications listed in the enclosure have been duly adopted and promulgated in accordance with the Laws of the State of North Carolina and the Rules of the Environmental Management Commission, and that these revisions are valid and enforceable in the State of North Carolina as of the effective dates provided in the enclosure.

Very truly yours,

Daniel S. Hirschman
Senior Deputy Attorney General

Exhibit E

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JUL 24 2018

Ms. Linda Culpepper
Interim Director
Division of Water Resources
North Carolina Department of Environmental Quality
1611 Mail Service Center
Raleigh, North Carolina 27699-1611

Dear Ms. Culpepper:

The United States Environmental Protection Agency has completed its review of the State of North Carolina's reclassification of the Lower Cape Fear River (LCFR). In accordance with section 303(c) of the Clean Water Act (CWA) EPA is disapproving these revisions because the documentation provided does not meet the State's existing definition of swamp waters[1] and does not address the technical concerns expressed in the Agency's formal comments to the State in 2015.[2] The Agency's decision on these revisions is detailed in the enclosed *Decision Document of the United States Environmental Protection Agency Determination Under Section 303(c) of the Clean Water Act Review of North Carolina's Reclassification for Lower Cape Fear River.*

The revisions were approved for adoption by the North Carolina Environmental Management Commission on September 10, 2015 and May 12, 2016. The reclassification was then submitted to the Agency for review by letter, dated April 9, 2018, and received on April 19, 2018. The reclassification added the Swamp supplemental classification to a 15-mile segment of the Lower Cape Fear River and included a management strategy.

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[1] The State defines "swamp waters" as "…those waters which are classified by the Environmental Management Commission and which are topographically located so as to generally have very low velocities and other characteristics which are different from adjacent streams draining steeper topography." The State did not provide documentation indicating that the velocities and other characteristics associated with the swamp classification apply to the LCFR. Nor did North Carolina submit velocity information showing that the LCFR segment is different from adjacent streams, or provide alternative dissolved oxygen or pH values that could demonstrate protection of the organisms living in the river, including endangered sturgeon. There is no support in the record for a structured scientific assessment of the waterbody conditions affecting the attainment of the use. Therefore, the requirements of the CWA and 40 CFR Part 131 have not been met.

[2] The EPA's comment letter dated March 2, 2015, suggested that the State provide additional documentation on the waterbody conditions that define swamp waters, such as velocity, to support North Carolina's determination that the swamp classification is appropriate for this segment of the LCFR.

A certification letter from the Senior Deputy Attorney General, dated March 28, 2018, was included in the submission from North Carolina and concludes that the revision was duly adopted pursuant to State law and is valid and enforceable in the State of North Carolina. In accordance with 40 CFR section 131.21(c), new and revised state and tribal water quality standards are not effective for CWA purposes until approved by the EPA. Since the revision added a designated use for this waterbody which was not supported by the record, the revisions were determined to be inconsistent with the goals of section 101(a) of the CWA and the implementing regulations at 40 CFR part 131.

In general, the EPA is supportive of states developing and utilizing site-specific criteria to support designated uses, and will approve site-specific criteria for specific designated uses if found to be protective of such designated uses. If the State would like to pursue the development of a use attainability analysis or site-specific criteria, the Region 4 EPA staff welcomes the opportunity to work closely with the State to ensure consistency with the current regulations and develop a path forward.

If you have any questions, please feel free to contact me at (404) 562-8357, or have your staff contact Ms. Lauren Petter at (404) 562-9272.

Sincerely,

Onis "Trey" Glenn, III
Regional Administrator

Enclosure

cc: Ms. Julie A Grzyb, NC DWR NPDES
Mr. Jeff Manning, NC DWR WQS

Executive Summary of Regulatory Decision

On April 19, 2018, the North Carolina Department of Environmental Quality transmitted several revisions to the state's water quality standards including a supplemental Swamp classification to a portion of the Lower Cape Fear River (LCFR), and a companion water quality management strategy. As described more fully below, the Environmental Protection Agency (EPA) has reviewed and is disapproving three specific revisions pursuant to section 303(c) of the Clean Water Act (CWA).

Two of the three provisions identify the subject segment of the LCFR as having a Swamp classification, which results in a modification to the state's designated use for this segment. For its review, the EPA considered the available information that North Carolina provided to support the designated use revision. Based on the documentation provided by the state, the record was insufficient in two ways. First, it did not provide adequate justification that the segment meets the state's definition of "swamp waters." Second, as part of the 2015 regulatory revisions to Part 131, the regulations clarify that a structured scientific assessment is required and since the state did not provide such an assessment, the Swamp designated use change is not appropriate. Therefore, the Agency concludes that the requirements at 40 CFR § 131.10 and section 303(c)(2)(A) have not been met and the revisions to include a Swamp classification for the LCFR are disapproved. Because the EPA's disapproval removes a supplemental classification, no further action is required by the EPA, since the default tidal salt water designation remains in place.

The third provision, which is part of the companion water quality management strategy, provides for a deviation from the dissolved oxygen criterion when certain conditions are met. The state did not provide the necessary documentation to show that the provision protects the designated uses and therefore, the requirements at 40 CFR § 131.11 and section 303(c)(2)(A) have not been met and the provision is disapproved. As with the other provisions, the EPA's disapproval removes a supplemental component to the previously existing regulatory requirements so no further action is required by the EPA.

The remainder of this document outlines the full detail of the EPA's review of the revisions received on April 19, 2018.

Decision Document of the United States Environmental Protection Agency
Determination Under Section 303(c) of the Clean Water Act Review of North Carolina's Reclassification for Lower Cape Fear River

Introduction

Section 303 of the Clean Water Act (CWA) requires states to establish water quality standards (WQS) and to submit any new or revised WQS to the EPA for approval or disapproval. In a letter dated April 9, 2018, from Linda Culpepper, Interim Director for the Division of Water Resources for the North Carolina Department of Environmental Quality (NCDEQ), to Trey Glenn, Regional Administrator of the EPA's Region 4 Office, NCDEQ submitted new and revised WQS for review by the EPA pursuant to section 303(c) of the CWA. In a March 28, 2018, letter, North Carolina's Senior Deputy Attorney General certified that the WQS revisions were duly adopted pursuant to North Carolina law. These materials were received by the EPA on April 19, 2018.

North Carolina's April 9, 2018, letter transmitted several revisions of the state's regulatory text to incorporate the addition of a supplemental Swamp (Sw) classification to the already existing classifications associated with a 15-mile long section of the Lower Cape Fear River (LCFR), as well as provide details on a companion water quality management strategy. As described more fully below, where the EPA has determined that the amendments to 15A NCAC 02B are themselves, new or revised WQS,[1] the EPA has reviewed and is disapproving those WQS pursuant to section 303(c) of the CWA.

Clean Water Act Requirements

In addition to the requirements of section 303 of the CWA, 33 U.S.C. § 1313, that states establish WQS and submit any new or revised standards to the EPA for review and approval or disapproval, the EPA's implementing regulations require states to specify appropriate water uses to be achieved and protected and to adopt water quality criteria that protect the designated use. See 40 CFR §§ 131.10(a) and 131.11(a). Such criteria must be based on a sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. Id. For waters with multiple use designations, the criteria shall support the most sensitive use. Id. In addition, the EPA's regulations require that in establishing criteria, a state shall consider WQS of downstream waters and shall ensure that its WQS provide for the attainment and maintenance of WQS of downstream waters. See 40 CFR § 131.10(b).

A state's submission of water quality criteria must include (1) the methods used and analyses conducted to support WQS revisions, (2) water quality criteria sufficient to protect the designated uses and (3) a certification by the State Attorney General or other appropriate legal authority within the state that the WQS were duly adopted pursuant to state law. See 40 CFR § 131.6.

As defined in 40 CFR 131.3(g), a use attainability analysis (UAA) is a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors as described in §131.10(g). States may designate a use, or remove a use that is *not* an existing use, if the state conducts a UAA as specified in 40 CFR 131.10(j) that demonstrates attaining the use is not feasible because of one of the factors in §131.10(g). A state must conduct a UAA as described in §131.3(g) and §131.10(g) whenever the state wishes to designate a sub-category of such a

[1] The EPA has provided FAQs on "What is a New or Revised Water Quality Standard Under CWA 303(c)(3)?" at http://water.epa.gov/scitech/swguidance/standards/cwa303faq.cfm. The link provides detailed information of such analysis.

use that requires criteria less stringent than previously applicable. See 40 CFR 131.10(j)(2). A state is not required to conduct a UAA whenever the state designates a sub-category of a use specified in section 101(a)(2) of the Act that requires criteria at least as stringent as previously applicable. See 40 CFR 131.10(k)(2).

State Regulatory Process and the Revisions

The revisions addressed in this document were discussed in a public hearing on February 5, 2015, and approved for adoption by the North Carolina Environmental Management Commission on September 10, 2015 and May 12, 2016. The first adoption date relates to the addition of 15A NCAC 02B .0311(t) and 15A NCAC 02B .0227, which were public noticed on January 2, 2015, and associated with the hearing on February 5, 2015. The second adoption date relates to the revisions to 15A NCAC 02B .0227, which were requested by the Rule Review Committee counsel, and were subsequently public noticed on December 15, 2015. No hearing was requested for the 15A NCAC 02B .0227 revisions, although a 60-day comment period was provided. In general, the revisions incorporate the supplemental Sw classification to the existing SC (salt water Class C) classification for the segment described below. The language specifically adopted in 15A NCAC 02B .0311(t) states:

> (t) The Schedule of Classifications and Water Quality Standards for the Catawba River was amended effective ~~[November 1, 2015]~~ August 1, 2016 with the reclassification of a section of 18-(71) from upstream mouth of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut from Class SC to Class SC Sw. A site-specific management strategy is outlined in 15A NCAC 02B .0227.

The above revision became effective on August 1, 2016, and is further described below.

As noted in 15A NCAC 02B .0311(t), there is a management strategy that corresponds to this section. The language specifically adopted in 15A NCAC 02B .0227(2) states:

> (2) A part of the Cape Fear River (Cape Fear River Basin) comprised of a section of Index No.18-(71) from upstream mouth of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut shall be protected by the Class SC Sw standards as well as the following site-specific action: All new individual NPDES wastewater discharges and expansions of existing individual NPDES wastewater discharges shall be required to provide treatment for oxygen consuming wastes as described in Parts (A) through *(C)* of this Subparagraph.
>
> (A) Effluent limitations shall be as follows: *BODs* = 5 mg/l, NH3-N = 1 mg/1 and DO= 6 mg/l, or utilize site-specific best available technology on a case-by-case basis for industrial ~~discharges.~~ discharges in accordance with Rule .0406 (e) of this Subchapter.
>
> (B) Seasonal effluent limits for oxygen consuming wastes ~~[will]~~ shall be considered ~~on a case-by-case basis~~ in accordance with Rule .0404 of this Subchapter.
>
> (C) Any new or expanded permitted pollutant discharge of oxygen consuming waste shall not cause the dissolved oxygen of the receiving water to drop more than 0.1 mg/1 below the modeled in-stream dissolved oxygen at total permitted capacity for all discharges.

The original revision became effective November 1, 2015, with the final language, indicated with the tracked changes shown above, becoming effective on July 1, 2016.

Background

In North Carolina, all tidal salt waters are at least covered by the designated use of Class SC. Class SC waters are protected for aquatic life propagation and maintenance of biological integrity (including fishing and fish), wildlife, secondary recreation and any other usages except for primary recreation or shellfishing. The SC classification is also considered a primary classification. In this instance, the state has added the Sw label as a supplemental classification to the primary classification. The term "swamp waters," which is already part of North Carolina's regulations, is defined as "...those waters which are classified by the Environmental Management Commission and which are topographically located so as to generally have very low velocities and other characteristics which are different from adjacent streams draining steeper topography." They are designated by "Sw" following the water classification.

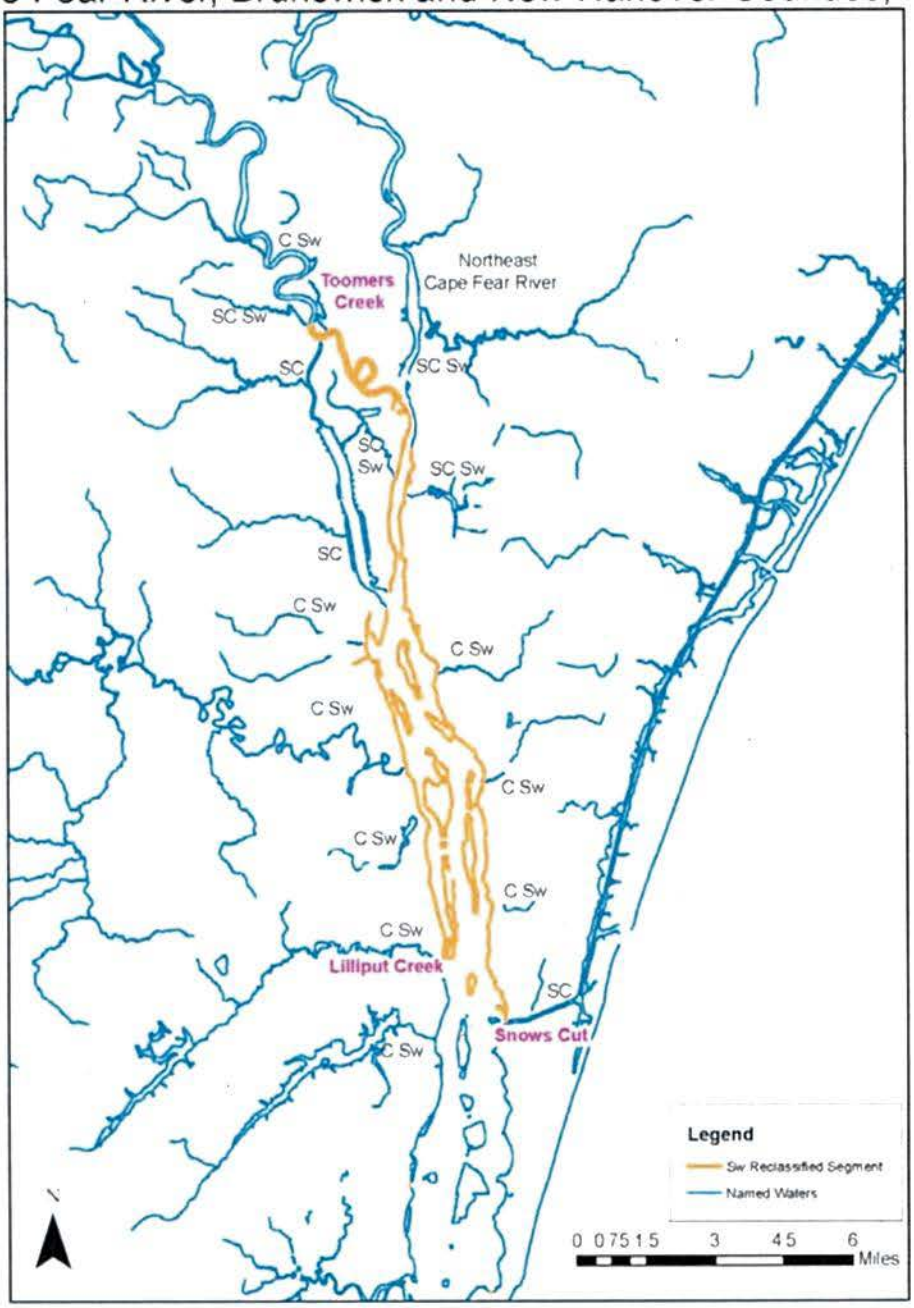
Revising the designated use of the LCFR to add the Sw supplemental classification to the existing SC primary classification allows lower dissolved oxygen and pH criteria than allowed under the SC classification, where lower dissolved oxygen or pH concentrations are caused by natural conditions. In this rulemaking, the state did not simultaneously establish the natural conditions in the river. However, the ability to have lower concentration limits than the previously applicable numeric criteria for pH and dissolved oxygen also results in a potential for lowering of the ambient water quality condition. This ability to have lower criteria is the component that ties the EPA's review to 131.10(j)(2). The following table summarizes the differences associated with the applicable pH and dissolved oxygen criteria before and after the revisions.

Classification	pH	Dissolved Oxygen (DO)
Class SC	6.8 – 8.5	5.0 mg/l
Class SC Sw	6.8 – 8.5, but as low as 4.3 if result of natural conditions	5.0 mg/l, but lower than 5.0 mg/l if caused by natural conditions

In addition to the additional criteria that can be applied to this segment, the state has adopted a water quality management plan to accompany the revisions to the designated uses for this waterbody. As part of the documentation in Enclosure 1, North Carolina indicates that a "water quality management plan is a strategy tailored to protect existing uses or quality of waters in specific waters" and 15A NCAC 02B .0227 specifically provides that: "In implementing the water quality standards to protect the existing uses...of the waters of the state or the water quality which supports those uses, the Commission shall develop water quality management plans on a priority basis to attain, maintain or enhance water quality throughout the state."

In the submission materials, the state provided the following map, which highlights the location associated with the revision, and for additional information, shows which adjacent segments have previously been designated as swamp waters.

Cape Fear River, Brunswick and New Hanover Counties, NC



EPA's Analysis of the Revisions

Before proceeding to the discussion of individual provisions, the EPA's review includes an analysis of whether or not a provision is a new or revised water quality standard. The Agency, using the decision criteria referenced in footnote 1, has determined that some of the provisions adopted by the state are not subject to the EPA's review under section 303(c). In those instances, the discussion will be brief and indicate that was the EPA's conclusion. When a provision is determined to be a new or revised water quality standard, there will be additional discussion regarding the provisions' consistency with statutory and regulatory requirements.

15A NCAC 02B .0311(t)

(t) The Schedule of Classifications and Water Quality Standards for the Catawba River was amended effective ~~[November 1, 2015]~~ August 1, 2016 with the reclassification of a section of 18-(71) from upstream mouth of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut from Class SC to Class SC Sw. A site-specific management strategy is outlined in 15A NCAC 02B .0227.

The revision at 15A NCAC 02B .0311(t) includes two sentences. The first sentence is the primary regulatory location where the state added a Sw supplemental classification to the specified segment of the LCFR and is further discussed below. The EPA determined that the second sentence is not a new or revised WQS and therefore is not subject to review under section 303(c) of the CWA.

Since North Carolina's Sw supplemental classification is considered a designated use change, the requirements at 40 CFR § 131.10(a) ("each state must specify appropriate water uses to be achieved and protected") and section 303(c)(2)(A) ("such standards shall be established taking into consideration their use and value for…propagation of fish and wildlife…") were considered for this provision. Pursuant to 40 CFR § 131.6(b), a state's WQS submission must include "methods used and analyses conducted to support water quality standards revisions." In addition, 40 CFR 131.10(j)(2) requires a state to conduct a UAA as described in §131.3(g) and §131.10(g) whenever the state wishes to designate a sub-category of such a use that requires criteria less stringent than previously applicable. The following summarizes the EPA's review of the first sentence of 15A NCAC 02B .0311(t) relative to these regulatory and statutory requirements.

For its review of the first sentence, the EPA considered the available information that North Carolina provided to support the designated use revision. A significant consideration was whether the record supported the designated use change, the sub-category of swamp waters, as defined by the state. Based on the documentation provided by the state, the record does not provide adequate justification that this segment meets the state's definition of "swamp waters." The state did not provide documentation indicating that the velocities and other characteristics associated with the Sw classification apply to the LCFR. Nor did North Carolina submit any velocity information showing that the LCFR segment is different from adjacent streams. The EPA's comment letter dated March 2, 2015, suggested that the state provide this additional documentation to support North Carolina's determination that the Sw classification is appropriate for this segment of the LCFR.

A Southern Environmental Law Center comment letter, dated February 12, 2016, included a quote from a representative of the National Oceanographic and Atmospheric Administration indicating DO levels below 5.0 mg/L and pH of 4.3 "would be problematic for sturgeons of either species" in the river because "[f]undamentally, sturgeons are adapted for life in big, well-flowing rivers..." This statement, which speaks to both the presence of sturgeon and their habitat requirements, serves to further highlight that identifying this segment as swamp waters is inconsistent with both the common interpretation of swamp and the state's own definition of swamp waters. Additionally, while the state has indicated that the surrounding tributaries are also designated as swamp waters and therefore influencing the water quality in the 15-mile segment affected by this revision, the state has not sufficiently demonstrated that this riverine stretch of the LCFR exhibits the same swamp water characteristics of these smaller tributaries. Therefore, for the reasons described above the EPA concludes that North Carolina has not demonstrated that the subject water is "topographically located so as to generally have very low velocities and other characteristics which are different from adjacent streams draining steeper topography."

Further, the Agency considered whether the state met the requirements of 40 CFR § 131.10. As part of the 2015 regulatory revisions to Part 131, the regulations clarify that a UAA is required when a state redesignates a use to one with criteria less stringent than the previously applicable use. Since the criteria for pH and DO can be lowered in the case of natural conditions, the addition of the Sw water designated use does not require criteria at least as stringent as the previously applicable SC use. Given the lack of support in the record for a structured scientific assessment of the §131.10(g) factors affecting the attainment of the use, the Sw designated use change is not appropriate.

Based on the EPA's analysis, the Agency concludes that the requirements at 40 CFR § 131.10 and section 303(c)(2)(A) have not been met and the revision to include a Sw classification for the LCFR is disapproved. Because the EPA's disapproval removes a supplemental classification, no further action is required by the EPA, since the default Class SC designation remains in place. Therefore, North Carolina should continue to utilize the criteria associated with the Class SC designated use for all CWA purposes.

In general, the EPA is supportive of states developing and utilizing site-specific criteria to support designated uses, and will approve site-specific criteria for specific designated uses if the criteria are found to protect such designated uses. If the state would like to pursue the development of a UAA or site-specific criteria, the Region 4 EPA staff would be happy to work closely with the state to ensure consistency with the current regulations and a path forward.

15A NCAC 02B .0227(b)(2)

> (2) A part of the Cape Fear River (Cape Fear River Basin) comprised of a section of Index No.18-(71) from upstream mouth of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut shall be protected by the Class SC Sw standards as well as the following site-specific action: All new individual NPDES wastewater discharges and expansions of existing individual NPDES wastewater discharges shall be required to provide treatment for oxygen consuming wastes as described in Parts (A) through *(C)* of this Subparagraph.

The revision at 15A NCAC 02B .0227(b)(2) includes two sentences. The first sentence is the secondary regulatory location where the state added a Sw supplemental classification to the specified segment of the LCFR and is further discussed below. The EPA determined that the second sentence is not a new or revised WQS and therefore is not subject to review under section 303(c) of the CWA.

For the same reasons described in the analysis of the first sentence of 15A NCAC 02B .0311(t), the first sentence of 15A NCAC 02B .0227(b)(2) is disapproved and no further action is required by the EPA, since the default Class SC remains in place. Therefore, North Carolina should continue to utilize the criteria associated with the Class SC designated use for all CWA purposes.

15A NCAC 02B .0227(b)(2)(A)

> (A) Effluent limitations shall be as follows: *BODs* = 5 mg/l, NH3-N = 1 mg/1 and DO= 6 mg/l, or utilize site-specific best available technology on a case-by-case basis for industrial ~~discharges.~~ discharges in accordance with Rule .0406 (e) of this Subchapter.

The EPA determined that the sentence at 15A NCAC 02B .0227(b)(2)(A) is not a new or revised WQS and therefore is not subject to review under section 303(c) of the CWA.

15A NCAC 02B .0227(b)(2)(B)

(B) Seasonal effluent limits for oxygen consuming wastes ~~[will]~~ shall be considered ~~on a case-by-case basis~~ in accordance with Rule .0404 of this Subchapter.

The EPA determined that the sentence at 15A NCAC 02B .0227(b)(2)(B) is not a new or revised WQS and therefore is not subject to review under section 303(c) of the CWA.

15A NCAC 02B .0227(b)(2)(C)

(C) Any new or expanded permitted pollutant discharge of oxygen consuming waste shall not cause the dissolved oxygen of the receiving water to drop more than 0.1 mg/1 below the modeled in-stream dissolved oxygen at total permitted capacity for all discharges.

The revision at 15A NCAC 02B .0227(b)(2)(C) allows a lowering of 0.1 mg/l from the specified condition of "the modeled in-stream dissolved oxygen at total permitting capacity for all discharges." Since this revision impacts the allowable DO concentration in the waterbody, it is a new or revised water quality standard subject to the EPA's review.

Several other states in Region 4 have adopted provisions which allow a very limited ("0.1mg/L") lowering of ambient DO concentration from a natural background condition. These provisions have typically been adopted by states because of the variable nature of DO and require a demonstration of a natural dissolved oxygen concentration before allowing the deviation of 0.1 mg/L to occur. In this instance, the provision allows DO to deviate from a condition associated with the total permitted capacity for all discharges. The technical documents used by the EPA[2] to support 0.1 mg/L lowering provisions in other states is very specific to natural conditions, not to total permitted capacity. The EPA's comment letter to North Carolina, dated March 2, 2015, suggested that the state provide additional documentation to support this provision. Pages 12-13 of North Carolina's Report of Proceedings Document provides the following response to comments from the state related to this provision:

> Point Sources
> i. The petition seems to indicate that point sources will have waste load allocations developed for them.
> ii. The management plan should include the means by which the 0.1 mg/L cap on lowered DO will be determined. Important details to establish and get reviewed by stakeholders include the model to be used, input parameters, season to be modeled, location of compliance, and whether compliance is to be based on instantaneous versus average conditions.
> iii. How will prohibition against causing DO decreases be enforced it at all?
> iv. Replace "Any" with "All" (at the start of the last sentence of the proposed management plan) so that the cumulative impact of all additional permitted oxygen consuming waste is a diminishment of less than 0.1mg/L.
> v. Shouldn't allow any discharges to drop the DO levels; require whatever necessary to prevent that. 10 discharges could drop it 1 mg/l.

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[2] U.S. Environmental Protection Agency's Ambient Water Quality Criteria for Dissolved Oxygen. EPA 440/5-86-003. (April 1986).

Section 4, Precision and Bias, of the Membrane Electrode Method in *Standard Methods for the Examination of Water and Wasterwater*

vi. Need to set limits on industrial facilities' discharges as with non-industrial discharges.

• **Response:** The language within the following response is not proposed to be incorporated into the rule, but to provide information on how the dissolved oxygen impact from new or expanding discharges will most likely be assessed by the Division.

The model to be used will be the most currently available three dimensional water quality model, which at this time, is the Lower Cape Fear dissolved oxygen model, http://portal.ncdenr.org/c/document_library/get_file?uuid=a84477db-4d83-4cc0-a9b9-f7da7a6a51f9&groupId=38364. The model was finalized on October 2009 by the Division of Water Quality (now known as the Division of Water Resources). The model is calibrated to 2004 observed data and meteorological conditions. Model inputs are described in the report. The most critical season when dissolved oxygen is expected to be impacted is April-October, and this season will be the focus for model comparison.

The model will first be run with all existing discharges at full permitted capacity. This run will establish a baseline model for comparison. The baseline model will then be run with the addition of the proposed new or expanding discharge. Results from the two model runs will then be evaluated to determine the impact of a new or expanding discharge, and the entire area that is impacted by the discharge will be evaluated. If at any time there is a difference between these two model runs greater than 0.1 mg/L, the discharge will not be allowed. So, this approach will basically be a time-series comparison based on model output, and prohibition against causing DO decreases will be enforced via permit requirements stated in the proposed water quality management plan.

When modeling is conducted for a new or expanded discharge (as described directly above), the term "total permitted capacity" as stated in the proposed water quality management plan is to include all existing discharges as operating at their full permit limits plus the new or expanded discharge operating at its full permit limits. Rather than making the suggested language replacement as noted in the above fourth comment regarding point sources, DWR proposes to provide clarity to this issue by adding the following phrase to the end of the last sentence of the management plan: "for all discharges." Thus, the final sentence of the management plan would read as follows: "Any new or expanded permitted pollutant discharge of oxygen consuming waste shall not cause the DO of the receiving water to drop more than 0.1 mg/l below the modeled in-stream DO at total permitted capacity for all discharges."

The provision adopted by North Carolina raises both technical and legal concerns. Technically, the state also has not documented how allowing a deviation of 0.1 mg/L from the condition described in the provision (modeled in-stream DO at total permitted capacity for all discharges) protects the designated uses. Independent of that, the provision does not appear to be consistent with past provisions adopted in other Region 4 states, which allow deviations of DO up to 0.1mg/L from natural background conditions as recommended in EPA guidance. Legally, as written, the provision allows a different DO criterion expectation for National Pollutant Discharge Elimination System (NPDES) facilities which are new or expanding. Criteria must apply for all purposes under the CWA, and cannot be implemented for only some purposes under the CWA, such as NPDES permitting. Because of these concerns, the Agency concludes that the requirements of 40 CFR § 131.11 and section 303(c)(2)(A) have not been met.

Therefore, the EPA is disapproving this sentence and North Carolina should continue to utilize the criteria associated with the Class SC designated use for all CWA purposes.

Should North Carolina revise the designated use for this segment of the LCFR in the future, two possible options are available for North Carolina to address the EPA's disapproval of these revised WQS. The options include either developing a scientific record that supports the deviation of 0.1 mg/L from the total permitted capacity for all discharges or making the provision more akin to the natural conditions deviation language of other states. If the latter option is chosen for a future revision by the state, it is the EPA's recommendation that the state define in regulation what the natural condition of the LCFR is, at the same rulemaking time, in order to facilitate the use of such a provision.

Endangered Species Act

Section 7(a)(2) of the Endangered Species Act requires federal agencies, in consultation with the Fish and Wildlife Service or the National Marine Fisheries Service, to ensure that their actions are not likely to jeopardize the continued existence of federally listed species or result in the destruction or adverse modification of designated critical habitat of such species. However, the EPA Region 4 office concluded that there is no action to consult on since the revisions are either being disapproved or are not new or revised WQS.

Conclusion

Based on the reasons outlined above, it is our conclusion that the requirements of the CWA and 40 CFR part 131 have not been met for the revised use classification and the accompanying water quality management strategy revisions, which were subject to our review, and are therefore disapproved.

JUL 24 2018

Date

Onis "Trey" Glenn, III
Regional Administrator

Exhibit F

City of Wilmington
City Hall
102 North Third Street
PO Box 1810
Wilmington, NC 28402-1810
910.341.7815
910.341.4628 fax
wilmingtonnc.gov
Dial 711 TTY/Voice

April 30, 2018

Mr. Trey Glenn, Regional Administrator
Environmental Protection Agency, Region 4
61 Forsyth Street SW
Atlanta, GA 30303

Re: North Carolina's April 9, 2018 Request for Approval of Modifications to the Water-Quality Classification for the Lower Cape Fear River

Dear Mr. Glenn:

It has come to my attention that the North Carolina Department of Environmental Quality has requested that the U.S. Environmental Protection Agency approve a revised water-quality standard reclassifying the Lower Cape Fear River as "swamp water." I write today to state my strong concern over the potential reclassification and to ask that the Department's request be not be approved, until the citizens of Wilmington, North Carolina can be educated on the likely impacts to our already impaired stretch of river.

The Cape Fear River is currently in crisis. In June of 2017 we learned that the drinking water supply for a quarter of a million people in the Cape Fear watershed is contaminated with "GenX" and other PFAS compounds that Chemours and DuPont have been knowingly discharging into the Cape Fear River, the drinking water source for Wilmington, for decades.

The North Carolina Department of Environmental Quality, the Cape Fear Public Utility Authority, and Chemours have been working around the clock to address the situation. Enforcement actions and lawsuits have been filed, countless hearings have been held, and numerous scientific studies and modeling efforts are underway to discern the extent of the contamination, but the problem is not close to being resolved. The people of Wilmington are fearful and, rightfully, frustrated.

Now is absolutely not the time to make such a change to the designation of our river which could weaken water quality protections for the Cape Fear River. Our citizens already share great public and environmental health concerns and this is a proposal that has not been fully vetted with our local leaders and community at large. Thus far, as Mayor, I have

received differing responses to my pointed questions on how this change will impact the health of this section of river. Some experts have said that this will be a positive change while others that I have great respect for have voiced grave concerns. In light of all that has taken place regarding the Lower Cape Fear River, we deserve to have answers and be included in such a decision process.

The City of Wilmington requests that the request for reclassification of the Lower Cape Fear River not be approved until our community has an opportunity to be fully informed of likely impacts and have the opportunity to provide feedback. We urge you to not approve the North Carolina Department of Environmental Quality's request to approve the reclassification until such time.

Sincerely,

Bill Saffo

Mayor, City of Wilmington NC

CC: Michael Regan, Secretary, NCDEQ

North Carolina
Coastal Federation
Working Together for a Healthy Coast

July 20, 2018

Mr. Trey Glenn, Regional Administrator
Environmental Protection Agency, Region 4
61 Forsyth Street SW
Atlanta, GA 30303

Re: North Carolina's April 9, 2018 Request for Approval of Modifications to the Water Quality Classification for the Lower Cape Fear River

Dear Mr. Glenn:

It has recently come to our attention that the N.C. Department of Environmental Quality (DEQ) asked the United States Environmental Protection Agency (EPA) to approve a revised water-quality standard reclassifying the Lower Cape Fear River as "swamp water." The reclassification defies both federal law and observable facts. The North Carolina Coastal Federation urges EPA to deny this request.

The federation is a non-profit organization dedicated to protecting and enhancing coastal water quality and habitat. Our organization represents 16,000 supporters. For the past 36 years, the federation has been taking an active role in protecting coastal water quality, habitat and public beach access. Since 1982, the federation has worked with coastal communities and other partners to improve and protect coastal water quality and natural habitats, which are intricately tied to our coastal economy. By focusing primarily, but not exclusively on natural and productive estuarine shorelines, oyster and marsh restoration, coastal management and cleaning the estuaries of marine debris, we strive to support and enhance the natural environment. The reclassification of the Lower Cape Fear River poses impacts that are not compatible with the federation's priorities and efforts, and weakens existing legal protections and requirements for DEQ to address the existing water quality issues.

The federation represents North Carolinians who drink, fish, swim, and paddle the state's waters, including the Cape Fear River. These users place a high value on the quality of water resources, and will be adversely affected by the lowering of regulatory protections that will result from these proposed changes to the surface water quality standards, and the subsequent further degradation of water quality in the Cape Fear River. Earlier this year, the federation adopted the *Lower Cape Fear River Blueprint*, which is a collaborate effort to focus on the river's estuarine and riverine natural resources. Pressures from historic alterations, short-sighted development, unregulated industrial uses, conflicting water uses, and changes associated with climate alterations have affected drinking, surface and groundwater water supplies and quality, as well as ecosystem health. Through the unified approach outlined in the *Blueprint*, the federation aims to protect and restore the coastal Cape Fear River to maintain a healthy, productive, and resilient coast. The reclassification of the lower Cape Fear River as a "swamp water" is in direct conflict of these strategies and inconsistent with long-term restoration efforts.

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The state's reclassification decision ignores the very definition of "swamp waters." Under North Carolina law, "swamp waters" are those with "low velocities and other natural characteristics which are different from adjacent streams."[1] In granting the reclassification request, however, state officials made no mention of water velocities in the river.[2] In 2015, the EPA confirmed the importance of evaluating a waterbody's "flow regime, channel gradient, and…geomorphology" in a guidance document addressing "natural conditions" criteria."[3] In the words of the agency, "[a]n examination of natural geomorphic factors, such as lack of re-aeration due to the low channel gradient, as well as naturally high biological oxygen demand…from decomposition of riparian vegetation, should be documented to demonstrate that [a waterbody's] low DO is not due to eutrophication or other human-caused impacts." In reclassifying the lower Cape Fear River as a "swamp water," North Carolina officials failed to undertake this critical analysis.

North Carolina's reclassification of the lower Cape Fear River is also at odds with the "antidegradation" requirements of state and federal law.[4] As the EPA has emphasized in its regulations, the Clean Water Act requires that "[e]xisting instream water uses and the level of water quality necessary to protect such uses shall be maintained and protected."[5] North Carolina's antidegradation policy accordingly provides that "[e]xisting uses…and the water quality to protect such uses shall be protected by properly classifying surface waters and having standards sufficient to protect these uses."[6] In arbitrarily declaring that the lower Cape Fear is a "swamp water" with no need for dissolved-oxygen protections, state officials defied these requirements.

The ecological significance of this effort to ignore the water-quality problems on the lower Cape Fear River was recently confirmed by the National Marine Fisheries Service. On August 17, 2017, the Service designated the lower Cape Fear River as critical habitat for the endangered Carolina population of Atlantic sturgeon.[7] In doing so, the agency emphasized the importance of dissolved oxygen to the species, noting that "[t]he physical features essential for the conservation of Atlantic sturgeon" include "[w]ater quality conditions … with … oxygen values that support … [l]arval, juvenile, and subadult growth, development, and recruitment."[8] According to the agency, while "[a]ppropriate temperature and oxygen values will vary interdependently, and

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[1] 15A NCAC 02B .0101(e)(2) (states that "swamp waters mean those waters which are classified by the Environmental Management Commission and which are topographically located so as to generally have very low velocities and other characteristics which are different from adjacent streams draining steeper topography").
[2] *See* Report of Proceedings.
[3] *See* Framework for Defining and Documenting Natural Conditions for Development of Site-Specific Natural Background Aquatic Life Criteria for Temperature, Dissolved Oxygen, and pH: Interim Document (Feb. 2015), *available at* https://www.epa.gov/sites/production/files/2015-02/documents/natural-conditions-framework-2015.pdf (last visited July 20, 2018).
[4] *See* 15A NCAC 02B .0201 (North Carolina's antidegradation policy); 40 C.F.R. § 131.12(a) (establishing the minimum requirements for state antidegradation policies); *id.* § 131.6(d) (requiring the EPA to ensure that state water-quality standards include "an antidegradation policy consistent with § 131.12").
[5] 40 C.F.R. § 131.12(a)(1).
[6] 15A NCAC 02B .0201(b).
[7] Nat'l Marine Fisheries Serv., Final Rule, Designation of Critical Habitat for the Endangered New York Bight, Chesapeake Bay, Carolina and South Atlantic Distinct Population Segments of Atlantic Sturgeon and the Threatened Gulf of Maine Distinct Population Segment of Atlantic Sturgeon, 82 Fed. Reg. 39,160 (Aug. 17, 2017).
[8] 39,239-40 (codified at 50 C.F.R. § 226.225(b)).

depending on salinity in a particular habitat[,]" a concentration of "6.0 mg/L dissolved oxygen or greater likely supports juvenile rearing habitat, whereas dissolved oxygen less than 5.0 mg/L for longer than 30 days is less likely to support rearing when water temperature is greater than 25 °C."[9]

Because the reclassification of the lower Cape Fear River as swamp water is designed to allow dissolved-oxygen levels in the river to drop below 5.0 mg/L, it fails to provide for the "[m]aintenance and recovery of the water quality conditions required to sustain and recover" the region's Atlantic sturgeon population and therefore should be reversed.[10] In addition, the segment of the lower Cape Fear River in question has been designated as a Primary Nursery Area by the N,C. Division of Marine Fisheries.[11] State law requires that nursery areas be maintained, as much as possible, in their natural state, allowing fish populations "to develop in a normal manner with as little interference from man as possible."[12]

As a result of the recent critical-habitat designation, the EPA must consult with the National Marine Fisheries Service before taking action on the state's request.[13] The reclassification arbitrarily and unlawfully reclassifies the lower Cape Fear River as "swamp water," ignores the pollution caused by the region's industrial livestock operations, fails to protect an endangered population of Atlantic Sturgeon, and violates the antidegradation requirements of state and federal law.

The state's request should be denied since the reclassification will negatively impact water quality in the lower Cape Fear River.

Thank you for your attention to this matter.

Sincerely,

Todd Miller
Executive Director

Kerri Allen
Coastal Advocate

cc: Michael Regan, Secretary, DEQ

[9] *See* Report of Proceedings at a-102 (U.S. FWS comments on reclassification proposal) (citing "references demonstrating adverse effects to fish early lifestages at DO concentrations less than the standard of 5 mg/L").
[10] See 15A N.C. Admin. Code 02B .0110.
[11] See 15A N.C. Admin. Code 03R .0103.
[12] See 15A N.C. Admin. Code 10C .0501.
[13] *See* 16 U.S.C. § 1536(a)(2); *see also, e.g.,* National Marine Fisheries Service, Biological Opinion on EPA Approval of Water Quality Standards Under Section 303 of the Clean Water Act (July 29, 2016) (evaluating the impact of Florida's revised water-quality standards on listed species), *available at* http://repository.library.noaa.gov/view/noaa/14795 (last visited July 20, 2018).

StarNews ONLINE

Opinion

EDTORIAL: Why we should fear calling our river a swamp

By StarNews Editorial Board

Posted May 15, 2018 at 2:00 AM
Updated May 16, 2018 at 4:35 PM

"Drain the swamp!" our president declared on the campaign trail. But now some folks in Raleigh are trying to put a swamp in … downtown Wilmington?

The N.C. Department of Environmental Quality and the federal Environmental Protection Agency want to declare a 15-mile stretch of the Cape Fear River -- basically from Snow's Cut to Navassa -- as swamplands.

This set off Wilmington Mayor Bill Saffo, who, like all good mayors, is a booster at heart. Mr. Saffo knows that, in addition to other concerns, having our national-award-winning riverfront suddenly situated along a swamp might be the worst marketing move since New Coke or that water-bottling operation near the Chemours plant.

As Saffo notes, it's an image thing. Like Southern liberals, poisonous snakes and crabgrass, swamps have a bad reputation. They're yucky and mucky, breed mosquitoes and (against scientific evidence) the superstition persists that they exude poisonous miasmas that cause disease.

More recently, scientists have proved that swamps (or marshlands or wetlands) serve a vital purpose as breeding grounds and nurseries for commercial fish and as natural filters, keeping bad stuff out of our water. OK, except for the GenX.

Perhaps we should call that stretch of the river "marshlands." It does sounds ever so much nicer.

Unfortunately, there's a serious subtext here. One of the characteristic of swamps, according to the DEQ, is naturally low oxygen levels.

That's questioned by some groups, such as the Southern Environmental Law Center, which claim the low oxygen levels aren't the work of Mother Nature, but the result of fertilizers, other chemicals and animal waste flowing into the Cape Fear from livestock operations farther upriver.

Fertilizer runoff is a real thing; it's one of the persistent problems over at Greenfield Lake, which, at times, looks like ... a green field. If the SELC is right, this reclassification could get hog and chicken farmers off the hook in case, say, there's a massive fish kill, and put the onus on taxpayers.

Who's right? This is not a trivial question. The Cape Fear River, after all, is our prime source of drinking water. The mayor may be asking the right thing but for the wrong reason.

Reclassification ought to be delayed until an unbiased third-party expert can determine exactly what causes those low oxygen levels and to what extent, if any, human-caused runoff has something to do with it.

StarNews ONLINE

Opinion

OPINION, Rep. Deb Butler: Remove absurd 'swamp' designation

By Rep. Deb Butler | For StarNews Media

Posted Jun 20, 2018 at 2:01 AM

The catastrophic contamination of the drinking water supply for a quarter of a million people in the Cape Fear watershed has had one encouraging outcome. Our citizens, many of whom really didn't even know where their drinking water came from, are now keenly aware of our state's water-quality crisis, and they are galvanized into action. The general public, it seems, no longer blindly trusts our political and regulatory bodies to ensure the safety of the water. For nearly seven years, the N.C. General Assembly has systematically weakened water-quality protections, and now the people are paying the price, but at least they are now paying attention. If only this public engagement had happened sooner.

And in other nefarious business last year -- and well under the radar -- the McCrory Administration's Environmental Management Commission (EMC) designated a section of the lower Cape Fear River near Wilmington as a swamp. By changing the classification from "tidal salt water" to "swamp water," the regulatory water quality standards are reduced, allowing for even more pollution in that section of the river. And yes, I said river, because we all know it's the mighty Cape Fear River, not a swamp. Battleships are not moored in swamps.

The lower Cape Fear River, a 15-mile stretch of tidal water beginning near Leland and extending south toward Wilmington, is an essential aquatic habitat, fishing and recreation area. It has been a vital part of our identity and way of life since Wilmington was first settled in 1733.

For nearly 20 years, this stretch of water has been stuck on North Carolina's list of "impaired waters." Under the U.S. Clean Water Act, this designation requires that the state develop a strategy for addressing the issues. Instead, the EMC, at the request of the McCrory administration, simply reclassified that portion of the river, thereby allowing the waters to remain impaired and possibly get worse. What sort of short-sightedness is this?

How did the water become impaired? All signs point north, where Eastern North Carolina is home to the densest throng of industrial hog facilities in the world. The waste from these facilities is poorly managed due to lax regulations set by many of our state's industry friendly legislators -- the same folks who think it's OK to spray waste over a neighbor's property and then limit that person's damages.

According to the state Department of Environmental Quality, the river is in violation of the state's standards for dissolved oxygen, acidity, arsenic, copper, and nickel. Years of published scientific research indicates this pollution is directly related to runoff from industrial farms. Yet, if you tuned in to the House Select Committee on River Quality meeting, you know the disdain for science. At least two of the members of that committee accused the scientists who rendered their opinions on GenX of doing so for political gain!

How could the state legally call something that is clearly a river, a swamp? It is preposterous. And although they did accomplish the reclassification, I'm not sure it was legal. The Environmental Review Commission seems to have ignored their own regulatory definition of "swamp waters," which logically must be "low velocity" waters. The Cape Fear River is decidedly not low velocity. It also did not consider the many statutory factors governing the classification of waterways, such as size, depth, surface area, volume and, again, rate of flow.

The state officials behind the "swamp" designation asserted that the lower Cape Fear River's oxygen and acidity problems are due to "natural conditions," once again ignoring the science that indicates the troublesome levels are attributable to runoff from millions of pounds of animal waste. That is not natural.

The multibillion-dollar agriculture industry should be required to invest in better waste-management practices for their contracted farmers. And, the N.C. Department of Environmental Quality needs to reverse this reckless and negligent swamp designation as soon as possible.

It's hogwash!

Deb Butler is representative for N.C. House District 18.

Exhibit G

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MEMORANDUM OF AGREEMENT BETWEEN THE STATE OF NORTH CAROLINA AND THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 4

Section I. Introduction

This Memorandum of Agreement (hereinafter, MOA) establishes policies, responsibilities and procedures pursuant to 40 Code of Federal Regulations (C.F.R.) Part 123 and sets forth procedures for how the National Pollutant Discharge Elimination System (NPDES) program will be administered by the State of North Carolina, Environmental Management Commission and Department of Environment and Natural Resources, Division of Water Quality (hereinafter, the State) and reviewed by Region 4 of the United States Environmental Protection Agency (hereinafter, EPA or Region 4). All additional agreements between the State and EPA are subject to review by the Regional Administrator of the U.S. Environmental Protection Agency, Region 4 (hereinafter, the Regional Administrator), and the Director of the Division of Water Quality (hereinafter, the Director). If the Regional Administrator determines that any provision of any agreement does not conform to the requirements of Section 402(b) of the Federal Clean Water Act (hereinafter, the CWA), 33 U.S.C. 1251 et. seq., or to the requirements of 40 C.F.R. Parts 122-125, or other applicable federal regulations, the Regional Administrator shall notify the Director of any proposed revisions or modifications which must be in such agreements.

The Director and the Regional Administrator hereby agree to maintain a high level of cooperation and coordination between the State and EPA staffs in a partnership to ensure successful and effective administration of the NPDES program. In this partnership, EPA will provide to the State technical and other assistance on permit, compliance and enforcement matters when requested, as appropriate and as funding allows.

The State will administer an NPDES program in accordance with CWA Section 402, this MOA, applicable State legal authority, and the annual State Section 106 Program Plan (State 106 Workplan). The State has the primary responsibility to establish the State NPDES program priorities that are consistent with national NPDES goals and objectives. This agreement does not establish an agent relationship between EPA and the State, and no waiver of sovereign immunity is implied or assumed by this agreement.

The strategies and priorities for issuance, compliance monitoring and enforcement of permits, as established in this MOA, may be set forth in more detail in the State 106 Workplan, a Performance Partnership Agreement (PPA), or a State/EPA Enforcement Agreement signed by the Director and the Regional Administrator. This MOA, the State 106 Workplan, the PPA, and any other State/EPA agreement(s) regarding the NPDES program shall not be in conflict.

Either the Director or the Regional Administrator may initiate an action to modify this MOA at any time. However, before this MOA may be modified, any revisions must be in writing and signed by the Director and the Regional Administrator. It is recognized that organizational changes

may occur at federal or state levels as programs evolve. The parties agree that should the contact information contained herein require revision as a result of organizational changes, this document shall remain in full force and effect without the need for modification. Rather, it is agreed that should either party make organizational change(s) that affects the contact information contained herein, revisions to the contact information shall be accomplished through written notification to the other party within thirty (30) days after such organizational change occurs.

Section II. Scope of Authorization

The Director and the Regional Administrator agree that the State of North Carolina has been granted authorization to administer the NPDES permitting, compliance, and enforcement programs. The State does not exercise jurisdiction over federally-recognized Indian Tribal lands and will not be seeking such authority. Further, the State is not currently authorized for a federal biosolids management program as part of the NPDES program.

Review of New or Revised State Rules, Regulations or Statutes

Either EPA or the State may initiate a revision to the NPDES program. The State and EPA shall keep each other fully informed of any proposed modifications to its statutory or regulatory authority, its forms, procedures, or priorities.

1. Revision of the State's program shall be accomplished as follows:

   a. The State shall submit to EPA's Regional Administrator a modified program description, an Attorney General's statement, Memorandum of Agreement, or any such other documents, as EPA determines to be necessary under the circumstances after consultation with the State. EPA will determine if the proposed revision is substantial or non-substantial.

   b. If EPA determines that the proposed revision is substantial, EPA shall issue public notice of the proposed revision and provide an opportunity to comment for a period of at least thirty (30) days. The public notice will also provide an opportunity for the public to request a public hearing.

   c. The Regional Administrator will approve or disapprove program revisions based on the requirements of 40 C.F.R. Part 123 and the CWA. Notice of approval of a substantial change shall be published in the Federal Register. A program revision shall become effective upon the approval of the Regional Administrator.

   d. If EPA determines the revision to be non-substantial, notice of approval may be given by letter from the Regional Administrator to the Governor or his/her designee.

   e. In order to conform with new or revised promulgations of federal regulations, the State must revise its program within one year of promulgation of the new or revised federal regulations, unless the State must amend or enact a statute

to make the required revision or if a State legislative process must be completed, in which case such revision shall take place within two (2) years. [See 40 C.F.R. Part 123.62(e)]

f. The State will provide proposed revisions to EPA in a timely manner in consideration of the date the State needs to have EPA's review completed. After conducting a preliminary review of the State's proposed revision, EPA will provide to the State an estimated schedule for completing its review. The estimated review schedule will depend on the complexity of the proposed revision. EPA will, thereafter, provide the State with quarterly updates, as appropriate, regarding the status of its review.

2. The State must notify EPA whenever it proposes to transfer all or any part of any program from the approved State agency to any other State agency, and must identify any new division of responsibilities among the agencies involved. The new agency is not authorized to administer the program until given approval by the Regional Administrator under 40 C.F.R. Parts 123.62(b) and (c).

3. Whenever the Regional Administrator has reason to believe that circumstances have changed with respect to the State's program, he may request, and the State shall provide, a supplemental Attorney General's statement, program description, or other documents or information as are necessary.

Section III. General Provisions

The State program authorized to implement the NPDES program pursuant to the requirements of the CWA is the Department of Environment and Natural Resources created and provided authority by North Carolina General Statutes 143B-279.1 *et seq.*, and the Environmental Management Commission created and provided authority by North Carolina General Statute 143B-282.1 *et seq,* and implemented by Chapter 143, Article 21 of the North Carolina General Statues, and all other applicable rules of the North Carolina Administrative Code, Title 15A, Chapter 2.

A. State Responsibilities

In accordance with the priorities and procedures established in this MOA and the State 106 Workplan, the State will:

1. Create and maintain the legal authority and, to the maximum extent possible, the resources required to carry out all aspects of the State NPDES program, including revisions to State program legal authorities as provided for at 40 C.F.R. Part 123.

2. Ensure, to the extent possible, that EPA is kept fully informed and up-to-date regarding:

   a. Draft and final policy and program development documents related to the State NPDES program;

b. Draft, proposed, and final statutes, rules and/or regulations related to the State NPDES program;

c. New case law, settlement agreements, and remands of regulations related to the State NPDES program; and

d. Draft, proposed, and final technical guidance and policies which pertain to the State NPDES program.

3. Ensure that any proposed revision of the State NPDES Program is submitted to EPA for approval pursuant to 40 C.F.R. § 123.62(b).

4. Process in a timely manner and propose to issue, reissue, modify, terminate, or deny State NPDES permits to the following categories of applicants as specified in 40 C.F.R. Parts 122 and 123:

a. Industrial, federal facilities, commercial, mining and silvicultural dischargers;

b. Concentrated animal feeding operations and concentrated aquatic animal production facilities;

c. Domestic wastewater treatment facilities, including publicly owned treatment works and privately owned treatment works; and

d. Storm water dischargers, including municipal separate storm sewer systems (MS4s), and industrial storm water only dischargers.

5. Comprehensively evaluate and assess compliance with permit conditions (e.g., effluent limits and compliance schedules) and any applicable enforcement action as outlined in Section V of this MOA.

6. Maintain a vigorous program of taking timely and appropriate enforcement actions in accordance with State statutes, the CWA, 40 C.F.R. § 123.27, and as outlined in Section VI of this MOA.

7. Maintain an effective program to carry out the pretreatment responsibilities outlined in Section VII of this MOA.

8. Maintain an adequate public file or files, which must be easily accessible to EPA, for program evaluation for each permittee. Where applicable, such files must include, at a minimum, copies of:

a. permit application;

b. currently issued permit;

c. fact sheet or statement of basis;

d. draft permit submitted for public notice and comment;

e. proposed permit when prepared;

f. timely public comments received orally at a public hearing or in writing;

g. final permit or final order of denial;

h. relevant discharge monitoring reports (DMRs), including whole effluent toxicity (WET), toxicity reduction evaluation (TRE), and in-stream sampling requirements;

i. studies supporting permit limits (e.g., wasteload allocation, total maximum daily load, site specific analysis, and in-stream sampling data);

j. any relevant inspection reports;

k. any relevant enforcement actions;

l. relevant Compliance Schedule Reports;

m. storm water related documents, including storm water management plans and pollution prevention plans received by the State;

n. requests for hearings, motions for reconsideration and rehearing, and any order issued by the State;

o. all pretreatment related documents, including the permittee's pretreatment program and annual report, as applicable;

p. concentrated animal feeding operation (CAFO) related documents, including nutrient management plans, if required by federal regulations; and

q. other pertinent information and correspondence.

9. Submit to EPA the information described in this MOA, the State 106 Workplan and applicable portions of 40 C.F.R. Part 123. Additionally, upon request by EPA, the State shall submit specific information and allow access to any files necessary for evaluating the State's administration of the NPDES program.

10. Ensure that the conditions of the draft permit are written in compliance with the applicable water quality standards of all affected states, and that all affected states are, at a minimum, provided timely notice of such draft permit and any other information requested per 40 C.F.R. § 122.44(d)(4).

B. EPA Responsibilities

1. EPA will commit, to the maximum extent possible, funding to the State to support the State's responsibilities under the NPDES program.

2. Where no effective effluent guidelines or standards exist for a discharge, EPA is responsible for transmitting to the State technical information to assist in writing permit terms and conditions (e.g., contractor reports, draft development documents, and available permits and effluent data from similar facilities). Such information, if available, will be provided within thirty (30) calendar days of a request by the State.

3. As outlined in Sections V, VI, and IX of this MOA, EPA will oversee the State administration of the NPDES program on a continuing basis for consistency with the CWA, State law or rules, this MOA, the State 106 Workplan, and all applicable federal regulations. In addition, EPA may consider as a part of its assessment, comments from dischargers, the public, and federal and local agencies concerning the State administration of its NPDES program. Any such comments considered by EPA will be brought to the attention of the State by written correspondence, if the commenting party has not previously communicated with the State. Any information obtained or used by the State under the NPDES program shall be available to EPA, upon request, without restriction due to claims of confidentiality. If the information has been submitted to the State under a claim of confidentiality, the State shall inform EPA of that claim. Information claimed confidential which is used to develop permit conditions will be treated in accordance with 40 C.F.R. Part 2, Subpart B and 40 C.F.R. § 122.7.

4. Contingent on available EPA resources, EPA agrees to provide formal training courses in permit writing, compliance inspections, and enforcement.

5. EPA will provide assistance in obtaining retrievals or entering information into the Integrated Compliance Information System for the Clean Water Act National Pollutant Discharge Elimination System (ICIS-NPDES), either of which is currently being used hereafter, ICIS, (the successor database to the Permit Compliance System [PCS]). After initial ICIS-NPDES training by EPA Headquarters, additional support will be provided to the State upon request and as resources allow. Changes in ICIS-NPDES procedures will be provided to the State thirty (30) calendar days in advance of such change, if possible.

C. Nothing in this MOA shall be construed to limit EPA's authority to take action under Sections 308, 309, 311, 402, 504, or any other sections of the CWA.

D. Nothing in this MOA shall be construed to constitute or create any rights or valid defenses to regulated parties in violation of any environmental statute, regulations, or permit, including, without limitation, any defense to an enforcement action taken by the State or EPA.

Section IV. Permit Review and Issuance

The State is responsible for drafting, providing public notice, issuing, modifying, reissuing, denying, and terminating permits in accordance with Sections III and IV of this MOA, 40 C.F.R. Parts 122-123, and any other applicable regulations.

A. Receipt of New Permit Applications by the State

Upon receipt of a completed permit application or notice of intent for coverage under an NPDES general permit, the State will enter all required information directly into ICIS-NPDES or transfer this information electronically from the State data management system to ICIS-NPDES, consistent with the schedule and commitments in the current MOA.

B. EPA Review of Draft and Proposed Permits, Permit Modifications, and Permit Revocations and Reissuances

1. EPA's initial review will be of draft permits rather than proposed permits. For purposes of this document, a "draft permit" is the permit prepared for public notice and comment indicating the State's tentative decision to issue, deny, modify, revoke and reissue, terminate or reissue a permit. A "proposed permit" is the permit as prepared following the close of the public notice and comment period and sent to EPA prior to issuance as a final permit by the State. A proposed permit need not be prepared by the State and transmitted to EPA for review unless necessary under Paragraph B.6 below.

2. EPA will review all draft State NPDES program permits, permit modifications and revocations and reissuances for those discharges identified in Paragraph C.1.a-k below. No later than the date the draft permit is available for public notice, the State will send to the Region 4, Chief, NPDES and Biosolids Permits Section, one copy of the public notice, the draft permit, the application, the fact sheet or statement of basis associated with the draft permit, and notices of public hearings. When applicable, the submittal must be accompanied by a new source/new discharger determination and, if necessary, an antidegradation review for new or expanded discharges.

3. Except as set out in Subparagraph B.4. below, within thirty (30) calendar days of the date a copy of a draft permit and attachments is received by the Region 4, Chief, NPDES and Biosolids Permits Section, EPA may provide to the State written comments on, recommendations with respect to, or objections to the issuance of the draft permit. If EPA does not provide any of the above during this timeframe, the State may proceed under Paragraph B.6 below. A written objection by EPA during this initial thirty (30) day period need only set forth the general nature of the objection(s). If a general objection is provided within this thirty (30) day period, EPA shall have the remainder of the ninety (90) days from the date EPA received the draft permit to supply written specific grounds for objection. Notwithstanding the

foregoing, EPA may extend its review time on a particular permit to the full ninety (90) days, without providing a written general objection in the initial thirty (30) day period, by so notifying the State in writing. A copy of all written comments, recommendations or objections provided to the State will also be sent by EPA to the permit applicant.

4. If the initial permit information supplied by the State under Paragraph B.2 above is inadequate to determine whether the draft permit meets CWA guidelines, regulations, and requirements, EPA may request the State to transmit to EPA the complete record of the permit proceedings before the State, or any portions of the record that EPA determines are necessary for review. If this request is made within thirty (30) calendar days of receipt of the State submittal under Paragraph B.2 above, it will constitute an "interim objection" under 40 C.F.R. § 123.44(d)(2) and the full period for EPA review specified in this MOA shall recommence when the requested information is received by EPA.

5. All EPA comments and objections must be considered by the State along with any other public comments received on the draft permit. If EPA does not respond within thirty (30) calendar days of its receipt of the draft permit (or in the case of general permits, ninety (90) calendar days) or exercise its right to the full ninety (90) day review period, the State may take this absence of a response as concurrence with the draft permit and the State need not prepare a proposed permit and transmit it to EPA for review, except as provided in Paragraph B.6 below.

6. Following expiration of the period for public comment, a proposed permit will be drafted. The State may assume EPA has waived its review of the proposed permit and may issue the final permit without further review by EPA, unless,

   a. the State proposes to issue a permit which significantly differs from the draft permit as reviewed by EPA;

   b. EPA has provided objections to the draft permit;

   c. significant comments objecting to the tentative determination and draft permit have been presented at hearing or in writing pursuant to the public notice; or

   d. there were significant issues raised by a state which may be affected by the discharge.

   In such a case, the State will not issue the permit and will send to Region 4, Chief, NPDES and Biosolids Permits Section, a copy of the proposed permit for review in accordance with 40 C.F.R. § 123.44. Along with the copy of the proposed permit, the State also will transmit: comments and recommendations of any affected state; the State's response to any such comments or recommendations; significant written comments submitted pursuant to the public notice of the draft permit; a summary of

any significant comments presented at any hearing on the draft permit; and the response to comments prepared under 40 C.F.R. § 124.17 and N.C. Gen. Stat. § 143-215.1 and N.C. Admin. Code tit. 15A, r. 2H.0109 and .0111. EPA will, within fifteen (15) business days of the date the proposed permit and accompanying material were received, notify the State and the permit applicant of any general objections EPA has to the proposed permit or that it is extending the EPA review time on the proposed permit to the full ninety (90) calendar days to provide specific objections. If EPA does not, within this initial fifteen (15) day period, either notify the State that it has objections to the permit or that it is extending the EPA review time to ninety (90) days, then the State may issue the proposed permit as final.

7. Pursuant to 40 C.F.R. §§ 123.44(a) and (b), in the event EPA files a "general objection" to a "draft" or "proposed" permit, EPA shall have ninety (90) calendar days from the date the draft or proposed permit was received by EPA to supply the specific grounds for the objection. The specific grounds for the objection shall include the reasons for the objection, including the sections of the CWA or regulations which support the objection, and the actions that must be taken to eliminate the objection, including, if appropriate, the effluent limitations and conditions which the permit would include if it were issued by the Regional Administrator. The EPA objection must be based upon one or more of the criteria identified in 40 C.F.R. § 123.44(c). If the State fails to either request a hearing on the EPA objection or resubmit a permit revised to meet any specific objection on a proposed permit within ninety (90) calendar days of receipt of the objection, exclusive authority to issue the permit passes to EPA for one permit term. Any requests for a hearing on the objection and the procedure for resolving any objection shall be governed by 40 C.F.R. § 123.44.

8. Upon issuance of any NPDES permit for major dischargers, MS4s, CAFOs, general permits, for a discharger within any of the industrial categories listed in Appendix A to 40 C.F.R. Part 122, or for any other discharger listed in Section C.1.a-k below, the State will send to Region 4, Chief, NPDES and Biosolids Permits Section, one copy of the issued permit and associated documentation. All other final permits shall be available to EPA as requested.

9. If the final determination is to deny any permit listed in Paragraph B.8 above, a copy of the notice of the intent to deny shall be given to the Region 4, Chief, NPDES and Biosolids Permits Section, and to the applicant in accordance with applicable State rules and NPDES regulations.

10. In the case of general permits, EPA shall have ninety (90) calendar days from the date of receipt of the draft general permit to comment on, make recommendations with respect to, or provide written specific grounds for an objection to the general permit.

11. EPA may request to review any applicant's notice of intent (NOI) to be covered under a general permit, subject to the State's authority under N.C. Gen. Stat.

§ 143-215.1(b)(3) and (4) and N.C. Admin. Code tit. 15A, r. 2H.0100 *et seq.*. EPA will, within ten (10) business days after receipt of the NOI, notify the State in writing of any formal objection, and the reason(s) for such objection, to the applicant's suitability for coverage under the general permit.

12. The lowest levels at which EPA correspondence under this Section shall be signed and received are as follows:

    a. comments or recommendation letters shall be signed by the EPA NPDES State Coordinator and transmitted to the State's NPDES Permitting Program Manager;

    b. letters extending EPA's review time to the full ninety (90) days shall be signed by the EPA NPDES Permits Branch Chief and transmitted to the Director; and,

    c. all objection letters shall be signed by the EPA Water Management Division Director and transmitted to the Director.

C. Waiver of Permit Review by EPA

1. Except as hereafter expressly provided, EPA waives the right to comment on or object to the sufficiency of permit applications, draft permits, proposed final permits, and finally adopted permits for any existing discharges or proposed discharges with the EXCEPTION of the following:

    a. discharges which may affect the waters of another state, Indian Lands, and territorial seas;

    b. discharges proposed to be regulated by general permits, including storm water and CAFO dischargers (see 40 C.F.R. § 122.28); applicable only to review of draft, proposed, and final permits (not applicable to notices of intent [NOIs]);

    c. discharges from publicly owned treatment works (POTWs) with a daily average permitted discharge of at least 1.0 million gallons per day (MGD);

    d. discharges from any major discharger or a discharger within any of the twenty-one (21) industrial categories listed in Appendix A to 40 C.F.R. Part 122 for which the permit covers a wastewater source subject to a promulgated effluent guideline;

    e. discharges of process wastewater with an average discharge exceeding 0.5 MGD;

f. discharges from POTWs required to have a pretreatment program (40 C.F.R. Part 403);

g. discharges from CAFOs, not including NOIs;

h. discharges from MS4s, not including NOIs;

i. discharges of uncontaminated cooling water with a daily average discharge exceeding 500 MGD;

j. discharges proposed to be regulated in identified regional and/or national priorities; e.g., watersheds; a list of permits will be provided to the State only if the discharge type is not otherwise listed in Section IV.C. of this MOA; and

k. discharges from any discharger for which the permit incorporates pollutant trading. Pollutant trading shall be developed within the framework of EPA's 2003 Water Quality Trading Policy, or any subsequently revised national policy. Pollutant trading does not include reallocation of existing loads.

2. EPA also waives the right to review the following:

a. a modification of any permit for which the right to review the original permit was waived by EPA (unless the modification would put the permit in one of the categories in Section IV.C.1.); or

b. a modification of any permit which qualifies as a minor modification under 40 C.F.R. § 122.63.

3. EPA reserves the right to terminate the waivers in Paragraphs 1 and 2 above, in whole or in part, at any time prior to a permit becoming final. Any such termination and the reasons therefore shall be sent in writing to the State.

4. The foregoing waivers shall not be construed to authorize the issuance of permits which do not comply with applicable provisions of federal or State laws, rules, regulations, or effluent guidelines, nor to relinquish the right of EPA to petition the State for review of any action or inaction because of violation of federal or State laws, rules, regulations, or effluent guidelines.

D. Public Participation

1. The State shall give public notice in accordance with 40 C.F.R. Sections 124.10 (c), (d) and (e) whenever a draft permit has been prepared under 40 C.F.R. Section 124.6(d) or a hearing has been scheduled pursuant to 40 C.F.R. Section 124.12.

2. Public notice of the preparation of a draft permit shall allow at least thirty (30) days for public comment, and public notice of a public hearing, if one is determined to be appropriate, shall be given at least thirty (30) days before the hearing.

3. Draft permits, public notices, applications and fact sheets or statements of basis will be made available to any party upon request and upon payment of any applicable State duplicating fees.

4. Unless otherwise waived by the specific organization, in addition to the general public notice described in 40 C.F.R. Section 124.10(d)(1), the State will provide to the following organizations, a copy of the fact sheet or any comparable rationale, permit application (if any) and draft permits (if any) associated with the notice:

   a. U.S. Army Corps of Engineers;

   b. U.S. Fish and Wildlife Service (F&WS) and the National Marine Fisheries Service (NMFS) (the Services);

   c. Other appropriate state and federal agencies;

   d. Adjacent states and Indian Tribes (only for permits which affect them);

   e. Major Commands of the Department of Defense (DOD) (only for DOD permits); and

   f. The State Historical Preservation Officer (SHPO).

5. All NPDES major permits and general permits shall be publicly noticed in a manner constituting legal notice to the public under State law, in accordance with 40 C.F.R. § 124.10(c)(3).

6. The State shall provide an opportunity for judicial review in State court of the final approval or denial of permits that is sufficient to provide for, encourage, and assist public participation in the permitting process in accordance with 40 C.F.R. § 123.30.

E. State and Federal Agency Coordination: Endangered Species Act

EPA and the State agree to the following process to address issues involving federally-listed species and designated critical habitats, relative to issuance of NPDES permits.

1. The State will provide notice and copies of draft permits to the U.S. Fish and Wildlife Service and National Marine Fisheries Service (the Services), unless otherwise waived in accordance with Section D.4. The State understands that it may receive information from the Services on federally-listed species and designated critical habitats in State, with special emphasis on aquatic or aquatically-dependent

species. Also, EPA will share with State information on permits that may raise issues regarding impacts to federally-listed species or designated critical habitats.

2. The State will consider issues raised by the EPA or the Services regarding federally-listed species or designated critical habitats. If EPA has concerns that an NPDES permit is likely to have more than a minor detrimental effect on federally-listed species or designated critical habitats, EPA will contact the State to discuss identified concerns.

3. If the State is unable to resolve issues raised by the Services involving detrimental effects of a NPDES permit on federally-listed species or designated critical habitats, and if the Services have contacted EPA, EPA intends to work with the State to remove or reduce the detrimental effect. EPA will coordinate with the State and the Services to ensure that the permit will comply with all applicable water quality standards, which include narrative criteria prohibiting toxic discharges, and will discuss appropriate measures protective of federally-listed species and designated critical habitats.

4. EPA will provide the Services with copies of any comments it provides to the State on issues related to federally-listed species or designated critical habitats.

5. The State will comply with applicable federal laws in accordance with 40 C.F.R. § 124.59.

F. Issuance of Permits or Notice of Intent to Deny for All Permit Categories in Section C.1.a-k.

1. If the final determination is to issue the permit, the final permit will be forwarded to the permit applicant, along with a transmittal letter notifying the applicant that the permit is being issued. Copies of all issued permits, identified in Section C.1.a.-k., will be forwarded to EPA.

2. If the final determination is to deny the permit, notice of intent to deny shall be given to the Region 4, Chief, NPDES and Biosolids Permits Section, and to the applicant in accordance with applicable State rules and NPDES regulations.

G. Suspension or Revocation of Permits for all Permit Categories in Section C.1.a-k.

When the State makes a determination to suspend or revoke a permit, in whole or in part, EPA will be notified.

H. Major Discharger List

There shall be included as part of the State 106 Workplan a list of what constitutes a major discharger. Currently, the State 106 Workplan includes an industrial major discharger list and a municipal major discharger list. The industrial major discharger list shall include

those facilities and Phase 1 MS4[1] dischargers, mutually defined by the State and EPA as major dischargers based on a point rating worksheet or applicable definitions plus any additional industrial dischargers whose discharges, in the opinion of the State or EPA, have a high potential for violation of water quality standards. The municipal major discharger list shall include those facilities mutually defined by the State and EPA as major municipal discharges based on a design domestic treatment plant flow of at least 1.0 MGD, case-by-case exclusions due to actual discharge flows to surface waters may be considered.

[1] Phase 1 MS4s are defined by the lists in 40 C.F.R. Part 122.26 Appendices F, G, H and I.

I. Administrative or Court Action

If the terms of any permit, including any permit for which review has been waived by EPA, are affected in any manner by an administrative or court action, the State shall timely transmit a copy of the permit, with changes identified to the EPA and shall allow thirty (30) calendar days for EPA to review, comment on, or make written objections to the changed permit pursuant to CWA Section 402(d).

J. Technology-Based Variances

The State will conduct an initial review of all requests for Fundamentally Different Factors (FDF) variances, for variances under CWA Sections 301(c), (g), and (k), and 316(a), and for modifications to federal effluent limitations established under CWA Section 302, i.e., technology-based variances, and shall either approve or deny such requests. As needed, EPA will provide technical assistance to the State to evaluate the variance request.

1. If the State denies a request for a technology-based variance under CWA Sections 301(c) or (g), Section 302, or for FDFs, such determination shall be forwarded to the applicant and EPA.

2. If the State approves a technology-based variance (approval), the request, all accompanying documentation, and the State's approval shall be sent to EPA. EPA will provide quarterly updates regarding the status of its review of each submitted request to the State, until a final decision is made.

3. If EPA denies the State's approval, EPA will notify the State, who will notify the applicant. No technology-based variance may be included in an NPDES permit unless the State's approval has been signed-off by EPA. If EPA concurs with the State's decision, EPA will notify the State, who will prepare a draft permit factoring in the approval.

4. The State may continue processing the permit application while awaiting EPA's review and decision on the variance request. If the State proposes to issue the permit prior to EPA's decision, the permit must be drafted with the technology-based limits from which the applicant has requested a variance. If EPA approves the variance, the permit may be modified to incorporate the variance.

5. Approval by the State and by EPA for a given technology-based variance is only valid for the current permit term. Upon permit renewal, the technology-based variance must be reapplied for and reviewed once again by both the State and by EPA.

K. Variances or Other Changes to Water Quality Standards Specific to a Permit

The State will conduct an initial review of all requests for variances or other changes to water quality standards specific to a permit, allowed under CWA Section 303(c) and 40 C.F.R. Part 131, and either deny the request or adopt the variance. Examples of other changes to water quality standards include site-specific criteria, criteria changed based on recalculation procedures, and criteria changed based on a combination of recalculation procedures and Water-Effects Ratios (WERs). Examples that are not changes to water quality standards include mixing zones and WERs that are not in combination with a recalculation procedure. As needed, EPA will provide technical assistance to the State to evaluate the variance request.

1. If the State denies a request for a variance or other changes to water quality standards specific to a permit, such determination shall be forwarded to the applicant and EPA.

2. If the State adopts a variance or other change to water quality standards specific to a permit (adoption), the request, all accompanying documentation, and the State's adoption (i.e., the revised standard) shall be sent to the EPA's Standards, Monitoring, and TMDL Branch for review. (See 40 C.F.R. Sections 131.6 and 131.20(c) for the requirements for this submittal) The CWA requires that EPA approve changes to water quality standards within sixty (60) days and disapprove them within ninety (90) days. EPA will provide quarterly updates regarding the status of its review of the adoption to the State, until a final decision is made.

3. If EPA disapproves the adoption, EPA will notify the State, who will notify the applicant. If EPA approves the adoption, EPA will notify the State, who will prepare a draft permit factoring in the adoption. No effluent limitations based on a variance or other change to water quality standards may be included in an NPDES permit unless the variance or other change to standards has been approved by EPA. One exception to this is the case where the revised standard results in a more stringent criterion and effluent limitation than the previously applicable water quality standard.

4. The State may continue processing the permit application while awaiting EPA's review and decision on the revised standard. If the State proposes to issue the permit prior to EPA's decision, the permit must be drafted with the effluent limits necessary to achieve the existing water quality standard(s) from which the applicant has requested a variance. If EPA approves the revised standard, the permit may be modified to incorporate that standard.

5. Any variance from water quality standards specific to a permit must be re-evaluated by the State at each triennial review of water quality standards. [See 40 C.F.R. Section 131.20(a).]

Section V. Compliance Monitoring and Evaluation Program

The State agrees to maintain an effective compliance monitoring and evaluation program. For purposes of this MOA, the term "compliance monitoring and evaluation" shall refer to all efforts to assess whether all dischargers are in full compliance with laws and regulations constituting the State NPDES program, including any permit condition or limitation, any compliance schedule, any pretreatment standard or requirement, or any previous administrative or judicial enforcement action. Discharges endangering public health shall receive immediate and paramount attention. The State will operate a timely and effective compliance monitoring system to monitor and track compliance by dischargers with their permit conditions (e.g., effluent limits and compliance schedules) and any applicable enforcement action. The State will directly enter or upload the compliance monitoring and evaluation data on a schedule as required in the State 106 Workplan into ICIS-NPDES. Compliance monitoring shall focus on major dischargers and those other dischargers or types of dischargers identified in the State 106 Workplan in accordance with the priorities and time frames for compliance tracking as established in this MOA and as further delineated in the State 106 Workplan. All compliance monitoring and evaluation activities shall be undertaken in such a manner that, if the situation requires, will lead to timely, appropriate and effective enforcement actions as outlined in Section VI. As indicated in Section III.A. of this MOA, the State shall maintain complete records of all material relating to the compliance status of dischargers within the State, including Compliance Schedule Reports, DMRs, Compliance Inspection Reports, any other reports that permittees may be required to submit under the terms and conditions of a State permit or an approved pretreatment program (when applicable), and documents related to any administrative or judicial enforcement action.

A. Schedule Dates

The State will track the submission of all documents required pursuant to permit conditions or schedules, or any applicable administrative or judicial enforcement actions. In order to determine a discharger's compliance status, the State will conduct a timely and substantive review of all such submitted documents and consider enforcement action in the event a required document is not timely submitted or is otherwise inadequate.

B. Review of Self-Monitoring Information and Other Compliance Reports

1. For all major dischargers and those other dischargers or types of dischargers identified in the State 106 Workplan, the State will update ICIS-NPDES in accordance with sub-paragraph B.3 below with the information necessary to determine if:

    a. any required self-monitoring reports (including DMRs or other reports required to be submitted pursuant to a permit or an applicable administrative or judicial enforcement action) are submitted on time;

b. the submitted reports are complete; and

c. the permit conditions (e.g., effluent limits and compliance schedules) or requirements of an applicable administrative or judicial enforcement action are met.

2. The State will conduct a timely and substantive review of all such reports received and all independently gathered information to evaluate the discharger's compliance status. This evaluation will be uniform and consistent with the Enforcement Management System (EMS) as referenced in Section V.E.

3. The State will ensure that monitoring and evaluation data are entered directly into ICIS-NPDES or into a data management system which is uploaded into ICIS-NPDES. Data entry and accuracy rates will be as established in the State 106 Workplan.

4. DMR forms or electronic versions thereof, for any monitoring data required by an NPDES permit (or the NPDES portion of a State permit), shall be consistent with the requirements of 40 C.F.R. § 122.2.

5. Pursuant to 40 C.F.R. § 122.2, EPA may object in writing to deficiencies in reporting forms used by permittees or the State. The State will ensure that deficiencies identified by EPA are adequately addressed.

6. For all major dischargers subject to regulation under Section 402 of the CWA, the State will submit, on a quarterly basis, an automated Quarterly Noncompliance Report (QNCR) with appropriate annotations for all instances of non-compliance as set forth in 40 C.F.R. § 123.45. The QNCR shall include the information set forth in 40 C.F.R. § 123.45 including:

   a. Facility name, location, and permit number;

   b. Description and date history of each noncompliance;

   c. Description of and dates of actions by the State to obtain compliance;

   d. Current compliance status (including date of resolution or return to compliance if it has occurred); and

   e. Mitigating circumstances.

   The State agrees to utilize ICIS-NPDES to produce the automated QNCR with hand-written annotations, if necessary. EPA agrees to provide assistance in generating these automated QNCRs. Per 40 C.F.R. § 123.45(d), the State shall submit the

QNCR on November 30th, February 28th, May 31st, and August 31st of each year. Dates are dependent upon ICIS-NPDES.

7. On a quarterly basis, EPA will generate for the State's review a list (e.g., the Watch List) of facilities which appear to be in non-compliance based on certain EPA selection criteria. The State will confer with EPA concerning data correction, if applicable, and/or the appropriate enforcement response for these facilities. The State will advise EPA if the State has already initiated enforcement.

8. EPA will from time to time review ICIS-NPDES data against source documents (DMRs, inspection records, enforcement actions, etc.) to verify the accuracy of the ICIS-NPDES data and the QNCRs.

9. In accordance with 40 C.F.R. § 123.26(b)(4), the State shall maintain procedures for receiving and ensuring proper consideration of information about alleged violations submitted by the public.

10. 40 C.F.R. § 123.45(b) requires the submission of a Semi-Annual Statistical Summary Report (SSSR) containing information concerning the number of major dischargers with two (2) or more violations of the same monthly average limitation within a six (6) month period. EPA will generate the SSSR from ICIS-NPDES bi-annually for the periods ending June 30th and December 31st and provide the draft to the State on August 31st and February 28th, respectively, for review and submission.

11. 40 C.F.R. § 123.45(c) requires the submission of an Annual Noncompliance Report (ANCR) containing information concerning the number of non-major discharges in noncompliance. EPA will generate the ANCR annually from ICIS-NPDES and provide the draft to the State by the last day of February for review and submission.

12. EPA shall provide the State notification of citizen complaints through a phone call, email message, or copy of the written complaint.

C. Facility Inspections

1. Types
The different types of compliance inspections are described in the Foreword of the latest edition of EPA's *NPDES Compliance Inspection Manual.* The manual may be found at EPA's website.

2. General Procedures
In accordance with the requirements contained in 40 C.F.R. § 123.26, the State shall maintain and implement an inspection and surveillance program to determine the compliance status of dischargers independent of information supplied by dischargers. The State and EPA will develop, as part of the State 106 Workplan, an inspection plan of individual major dischargers proposed to be the subject of compliance audits and inspections and a projection of the number of minor dischargers to be inspected

for the coming year (October through September). The inspection plan is a living document and may be amended at any time dependent on priorities of and in consultation with EPA and the State. Unless otherwise agreed to by EPA in writing, the State shall conduct compliance inspections as provided for in the State 106 Workplan. The State will give EPA adequate notice and opportunity to participate with the State in its inspection activities. EPA or the State may determine that additional inspections are necessary to assess compliance. If EPA makes a determination that additional inspections are necessary or appropriate, EPA shall notify the State of such determination and may perform the inspections alone or jointly with the State or may request that the State conduct those inspections. EPA will keep the State fully informed of its plans and the results of any inspections. Pursuant to 40 C.F.R. § 123.24(b)(4)(i), EPA will normally provide the State at least seven (7) calendar days notice before a joint or independent inspection is conducted.

3. Reporting Schedule
The State will ensure data entry of necessary inspection information, including violations detected which will cause the facility to be in Significant NonCompliance (SNC), into ICIS-NPDES in accordance with and on a schedule established in the State 106 Workplan. All inspection reports will be thoroughly reviewed by the State to determine what, if any, enforcement action (as outlined in Section VI of this MOA) shall be initiated. The State will forward copies of inspection reports to EPA upon request. Where an audit or inspection is conducted solely by EPA, a copy of the audit or inspection report will be forwarded to the State within sixty (60) calendar days after the inspection or at the time it is transmitted to the audited or inspected facility.

4. Biomonitoring Inspections
Except as otherwise set forth in the State 106 Workplan, the State shall have the ability to conduct biomonitoring inspections, have them conducted through designated contractors, or have an equivalent program to independently verify a discharger's compliance with the WET requirements of its permit.

D. Miscellaneous Compliance Activities

1. Information Requests
Whenever EPA or the State requests information from the other concerning a specific discharger and the requested information is not available from the files, that information will be researched and, if possible, provided to the requesting agency within a reasonable time.

2. Laboratory Quality Assurance
The State will plan, initiate, and maintain a program as provided in the State 106 Workplan to ensure that laboratories doing work for the State permitted dischargers follow approved quality assurance protocols.

3. Emergency Pollution Incidents
EPA and the State shall immediately notify each other by telephone or through a mutually agreed upon emergency response protocol upon receipt by EPA or the State of any information concerning a situation which in its opinion poses an actual or threatened pollution incident that may result in endangerment to human health or the environment. The State shall also ensure that all potentially affected downstream drinking water intake facilities are notified of the situation (including notification across state lines when applicable) so that they can take appropriate actions to minimize risk to the public. The State shall be notified at (919) 733-5083. These numbers are staffed by the Emergency Response Coordinator, PERCS Unit. The EPA shall be notified by telephone at (404) 562-8700 (Region 4 Emergency Response Section/Waste Management Division) or (800) 424-8802 (National Response Center, Washington, DC).

E. Enforcement Management System (EMS)

Within one hundred and twenty (120) calendar days of the execution of this MOA or as otherwise established in the State 106 Workplan, the State shall submit to EPA for review and comment a current EMS, which is otherwise known by the State as the DWQ EMS. The EMS is a document outlining procedures, policies, etc., to be used by the State in conducting official business (e.g., inspections, enforcement actions, assessment of penalties, etc.). Such procedures and policies with respect to enforcement shall be consistent with EPA's "Enforcement Response Guide" for the NPDES program and shall include application of technical review criteria for screening the significance of violations, procedures and time frames for selecting appropriate initial and follow-up response options to identified violations, and procedures for maintaining a chronological summary of all violations. The State shall implement the EMS. The State agrees to submit any changes to the EMS to the EPA Region 4, Water Programs Enforcement Branch for review and comment.

Section VI. Enforcement

A. Timely and Appropriate Enforcement Responsibility

1. The State is responsible for commencing and completing timely and appropriate enforcement action (as set forth in this Section) against dischargers in violation of the laws and regulations constituting the State NPDES program, including any permit conditions or limitations, compliance schedules, pretreatment standards or requirements, or previous administrative or judicial enforcement actions. This responsibility encompasses violations detected through any means including, without limitation, the compliance monitoring activities set forth in Section V above.

2. A State enforcement action shall be considered timely and appropriate if it:

   a. Addresses all identified violations of the laws and regulations constituting the State NPDES program and Sections 301, 302, 306, 307, 308, 318, 402, or

405 of the CWA including, without limitation, discharging without a required permit and violations of effluent limitations, pretreatment standards and requirements, compliance schedules, all other permit conditions, or any previous administrative or judicial enforcement action.

b. Seeks or imposes, where appropriate, penalties consistent with 40 C.F.R. § 123.27 and the factors set forth in Sections 309(d) and 309(g)(3) of the CWA;

c. Adequately addresses the injunctive relief necessary to bring the discharger back into compliance within a reasonable period of time and pursuant to an appropriate schedule which contains interim milestones necessary to measure the progress towards a final compliance date;

d. Is commenced and completed within the time frames set forth in this Section VI.A; and

e. Is consistent with the other provisions of this Section VI.A.

3. In the case of a violation by a major discharger, or other dischargers or types of dischargers identified in the Sate 106 Workplan, or for a violation that would cause a facility to be in SNC, the State will determine within thirty (30) days the appropriate initial response to the violation. Where the State has determined an enforcement action is appropriate, it shall commence such appropriate enforcement action within thirty (30) calendar days of its determination of the initial response. This response shall be documented in the compliance and/or enforcement file within sixty (60) days of identification of the violation. It is recognized that a definition for SNC has not been developed for conventional minors, storm water, CAFOs, SSOs or CSOs. Therefore, as definitions for SNC are developed for these categories, the timelines for initial response will be established in the State 106 Workplan. The date of identification of the violation is the point at which the State enforcement staff learns of the violation. The State shall make every effort to pursue and complete all the enforcement actions it takes within a reasonable amount of time.

4. Enforcement actions determined to be appropriate by the State with respect to any violations other than those identified in Paragraph A.3 above, while generally given lower priority, should be commenced and completed within a reasonable amount of time.

5. If an initial response action by the State proves not to be effective in bringing the discharger into compliance within the required or a reasonable time period, timely and appropriate enforcement action requires that the State or EPA shall follow up with other, more significant enforcement mechanisms to achieve timely and appropriate compliance.

6. For violations which present an imminent and substantial endangerment to the health, safety, or welfare of the public or to the environment of the State, the State shall take timely and appropriate enforcement action to effect the immediate correction of the violation which may include, but not be limited to, a complaint for injunctive relief under N.C. General Statute §§ 143-215.3(a)(5) and 215.6C or an immediate final order pursuant to N.C. General Statute § 143-215.3(a)(12). Such action shall be taken as soon as possible after the State or EPA makes a determination that the condition or activity is of a nature which, if not abated, may pose an imminent and substantial endangerment to the health, safety, or welfare of the public (when appropriate, such action should be taken within ten (10) calendar days from the initial notification to the State of the condition or activity).

7. Copies of all formal enforcement and penalty actions issued against all dischargers shall be submitted to EPA upon request.

8. In accordance with 40 C.F.R. § 123.24(b)(3), the State shall retain records that demonstrate that its enforcement procedures result in: appropriate initial and follow-up response and enforcement actions that are applied in a uniform and timely manner; enforcement actions that clearly define what the discharger is expected to do by a reasonable date certain pursuant to an appropriate schedule which contains interim milestones necessary to measure the progress towards final compliance; and the assessment of a civil penalty, when appropriate, based on the consideration of factors set forth in Sections 309(d) and 309(g)(3) of the CWA, or factors established in a State penalty policy consistent with Sections 309(d) and 309(g)(3) of the CWA, and in an amount appropriate to the violation. Such records would include penalty calculations and/or penalty rationale.

B. EPA Actions

1. The *Revised Policy Framework for State/EPA Enforcement Agreements*, signed by then Deputy Administrator A. James Barnes on August 25, 1986 (the 1986 Policy), sets forth the expectations for the working relationship between EPA and states in the compliance and enforcement program. It outlines a "no surprises" approach to partnering with states to enforce environmental statutes and regulations. The policy identifies some criteria and examples of instances when it makes sense for EPA to play a major role, and where federal resources, expertise and authorities can be critical to achieving a comprehensive and effective resolution of violations. Examples of instances where direct federal action is appropriate include the following: (a) a state or local agency requests EPA action; (b) a state or local enforcement response is not timely and appropriate; (c) national precedents (legal or program) are involved; (d) there has been a violation of an EPA order or consent decree; and (e) federal action would support the broader national interest in deterring noncompliance. Factors EPA will consider in deciding whether to take direct enforcement in the above type cases include: (a) cases specifically designated as nationally significant (e.g., significant noncompliers; explicit national or regional priorities); (b) significant environmental or public health damage or risk involved;

(c) significant economic benefit gained by the violator; (d) interstate issues; and (e) repeat patterns of violations and violators.

2. EPA will verify and determine the timeliness and appropriateness of State enforcement actions. In instances where EPA determines that the State has not commenced or has not completed a timely or appropriate enforcement action for violations by any discharger in accordance with Section VI.A, above, EPA may proceed with any or all enforcement options available under the CWA against the discharger in violation.

3. Pursuant to Section 309(a)(3) of the CWA, EPA may take direct enforcement action as the Agency deems appropriate. EPA generally will provide the State with advance notice at an appropriate management level prior to taking a direct federal action. This notice can be written, electronic (email), or by a telephone call. EPA will provide and the state will provide, upon request, each other with copies of any enforcement actions taken. Early and full communication and coordination between EPA and the state, (e.g., early notification of inspections, the basis of and intent for enforcement actions prior to initiation of any action, and other information sharing) have proven very effective in resolving compliance and enforcement matters. The parties to this agreement recognize that issues of imminent and substantial endangerment and criminal cases may present special circumstances and may not permit the same level of pre-filing coordination.

C. Appropriate Involvement of the State Office of the Attorney General

The State will establish procedures for routine coordination on enforcement cases between the State and the appropriate legal resources within the State such as the State Attorney General (AG), including notification of proposed enforcement actions and general time frames for actions from case referral to filing.

D. Nothing in this agreement should be construed to constitute or create a valid defense to regulated parties in violation of environmental statues, regulations, or permits.

Section VII. Pretreatment

This Section is intended to supplement the requirements of the other Sections of this MOA so as to define the State and EPA responsibilities for establishment and enforcement of the National Pretreatment Program under Sections 307(b) and (c) and 402 of the CWA and EPA policies and guidance. To the extent the specific requirements set forth below are inconsistent with requirements in other Sections of this MOA, the specific requirements in this Section shall control.

A. General Program

The State has primary responsibility for ensuring:

1. Enforcement against sources introducing pollutants prohibited by 40 C.F.R. § 403.5;

2. Application and enforcement of N.C. General Statute § 143-215.3(a)(14) and N.C. Administrative Code title 15A.4.2H.0900 et seq., and the National Categorical Pretreatment Standards (NPS) established by EPA in accordance with Section 307 of the CWA;

3. Review, approval, denial and oversight of POTW Pretreatment Programs to see that N. C. General Statute § 143-215.3(a)(14) and N.C. Admin. Code tit. 15A.4.2H.0900 et seq, is enforced in accordance with procedures outlined in that Chapter and federal regulations;

4. Incorporation of POTW Pretreatment Program conditions in permits issued to POTWs as required in N. C. General Statute § 143-215.1 and N.C. Admin. Code tit. 15A.r.2H.0100 to be in conformance with Section 402(b)(8) of the CWA and 40 C.F.R. § 403.8;

5. Review and, as appropriate, approval of POTW requests for authority to modify categorical pretreatment standards to reflect removal of pollutants by a POTW in accordance with 40 C.F.R. §§ 403.7, 403.9, and 403.11 and enforcement of related conditions in the municipal permit;

6. POTW Pretreatment Programs comply with requirements specified in 40 C.F.R. § 403.8 and the POTW's State permit.

B. Permitting

1. The State shall control through permits, all significant IUs which do not discharge to an approved POTW program which issues a permit. The State shall issue these permits in accordance with 40 C.F.R. § 403.8 and consistent with EPA's *Industrial User Permitting Guidance Manual* (September 1989). The State will issue, reissue, or modify permits according to the procedures outlined in Section IV of this MOA.

2. <u>Section 403.6(a) NPS Categorical Standards</u>

   The State shall review requests from IUs for industrial category or subcategory determinations received within sixty (60) calendar days after the effective date of an NPS for a subcategory under which an IU believes itself to be included and prepare a written determination and justification as to whether the State shall forward its findings together with a copy of the request and necessary supporting information to the EPA, Region 4 Water Programs Enforcement Branch Chief for concurrence. If EPA does not modify or object to the State proposed findings within sixty (60)

calendar days after receipt thereof, the State may take action approving or denying the request.

3. Section 403.7 Removal Credits

The State shall review POTW applications for removal credits for IUs who are or may be subject in the future to NPS. The State findings together with application and supporting information shall be submitted to the EPA Region 4 Water Programs Enforcement Branch Chief for review. No removal credits request shall be approved by the State if, during the thirty (30) calendar days (or extended) evaluation period provided for in 40 C.F.R. § 403.11(b)(1)(ii) and any hearing held pursuant to 40 C.F.R. § 403.11(b)(2), the EPA objects in writing to the approval of such a submission.

4. Section 403.13 Variances From Categorical NPS for Fundamentally Different Factors (FDF)

The State shall make an initial finding on all requests from IUs for variances from categorical NPS for FDF and, in cases where the State supports the variance, shall submit its findings together with the request and supporting information to the EPA Region 4 Water Programs Enforcement Branch Chief for a final review. The State will not grant a FDF request until written concurrence has been received from EPA. The State can deny requests for FDF without EPA review.

A. Compliance Monitoring

1. The State shall carry out independent inspection and surveillance procedures to determine compliance or noncompliance by the POTW with pretreatment conditions incorporated into their permit. The State also will carry out inspections and surveillance procedures to determine, independent of information supplied by the IUs, whether a representative sample of the IUs are in compliance with the NPS. Upon request, the State will provide EPA copies of any notice received from a POTW that relates to a new or changed introduction of pollutants to the POTW. The State shall carry out independent inspection, surveillance and monitoring procedures in accordance with 40 C.F. R. § 403.8 which will determine compliance or noncompliance with pretreatment conditions in IU permits issued by the State.

2. The State will conduct monitoring of approved local pretreatment programs to ensure POTWs implement the program consistent with the *Pretreatment Compliance Monitoring and Enforcement Guidance* (EPA, September 1986).

3. The State will develop procedures and time frames for reviewing monitoring reports, including reports submitted by POTWs and semi-annual reports submitted by categorical and significant non-categorical IUs in areas without local programs; establishing and maintaining a complete inventory of POTWs with pretreatment programs; and conducting annual audits or inspections or equivalent review of

program elements of POTWs with approved programs, including a sample of IUs in the POTW, consistent with State 106 Workplan commitments.

4. The State also shall have a plan for completing an inventory of all categorical and significant non-categorical IUs.

5. The State, as the Control Authority, will establish procedures and time frames for effective monitoring of IUs of POTWs consistent with 40 C.F.R. §§ 403.8(f) and 403.10(e). Included shall be procedures and time frames for reviewing monitoring reports including reports submitted by categorical and significant IUs.

6. The State shall also keep an updated inventory of all categorical users and significant IUs which it permits. The State, as the Control Authority, is responsible for inspecting and sampling IUs at least once per year consistent with 40 C.F.R. § 403.8(f)(2)(v).

7. The State shall provide EPA with the following information concerning Significant Industrial Users (SIUs) which it permits, as well as any other information required by the State 106 Workplan:

   a. An annual report of implementation;

   b. A pretreatment facility inspection and sampling plan;

   c. A quarterly noncompliance report for all SIUs to include:

      (1) facility name;

      (2) location and permit number;

      (3) description and date history for each noncompliance;

      (4) description of State actions and dates of State actions to obtain compliance;

      (5) current compliance status, including date of resolution or return to compliance date; and

      (6) mitigating circumstances.

D. Enforcement

1. The State will have enforcement response procedures and time frames consistent with the *Pretreatment Compliance Monitoring and Enforcement Guidance*, for State-permitted IUs, and with the *Guidance for Reporting and Evaluating POTW*

Noncompliance with Pretreatment Implementation Requirements (EPA, September 1989) for POTWs. This includes reporting all the State regulated POTWs (including minor POTWs with approved pretreatment programs) on the QNCR when reportable noncompliance (RNC) and SNC criteria are met. These procedures will include initiating appropriate enforcement action where POTWs fail to submit approvable pretreatment programs, have violations of State pretreatment requirements, or fail to submit timely reports. The State also will have procedures for evaluating whether POTWs are initiating appropriate enforcement responses to violations by IUs. Where POTWs are not the primary control authorities, the State is directly responsible for having these procedures in place for categorical and significant non-categorical IUs in accordance with 40 C.F.R. § 403.8(f)(2). These procedures will be reviewed annually.

2. The State will initiate enforcement action against permittees with pretreatment programs that are in SNC, as a result of: failure to meet milestones in enforceable schedules for submitting required local pretreatment programs; violations of effluent limits; and delinquent POTW pretreatment reports. Enforcement actions against these POTWs will be taken consistent with the criteria and time frames for the State program. The State also will initiate enforcement actions against POTWs for failure to adequately implement the pretreatment program or enforce against their IUs and will initiate IU enforcement actions where necessary, generally in conjunction with enforcement against the responsible POTW that is failing to enforce or as part of an overall strategy to bolster a local program. The State will ensure that POTWs provide, at least annually, public notification of significant violations in a newspaper(s) of general circulation that provide that meaningful public notice within the jurisdiction(s) serviced, in accordance with 40 C.F.R. § 403.8(f)(2).

3. The State will ensure that, at least annually, significant violations by permitted IUs are public noticed in accordance with 40 C.F.R. § 403.8(f)(2).

Section VIII. Transfer of Files from EPA to the State upon Subsequent Program Authorization

Upon approval of any subsequent NPDES Program modification for additional NPDES Program coverage by the Regional Administrator, EPA will immediately deliver to the State all project files for pending permit applications proposed for issuance/reissuance. Project files shall include all relevant information including but not limited to, application forms, correspondence, draft permits, public notices, fact sheets, statements of basis, and any other documents relating to the pending permit. EPA will ensure all project files are complete prior to delivery to the State.

EPA will deliver files for all other permits to the State in accordance with a mutually agreed upon schedule. Files shall contain all relevant information pertaining to the issuance of the permit as well as copies of all DMRs, all compliance reports, all enforcement actions, and other pertinent information and correspondence. EPA will ensure all files are complete prior to delivery to the State.

Section IX. Program Review

The State and EPA are responsible for ensuring that the State NPDES program is consistent with all requirements of this MOA, the State 106 Workplan, and applicable sections of 40 C.F.R. Parts 122-125 and 40 C.F.R. Parts 140 and 403.

A. To ensure that these requirements are fulfilled, EPA shall:

1. Review the information transmitted to the State to ensure that all the requirements of Section VIII of this MOA are met.

2. Meet with the State officials annually, as funds allow, to observe the data handling, permit processing, compliance monitoring, and enforcement procedures, including both manual and automated data processing.

3. Examine in detail the State files and documentation of selected dischargers to determine whether:

   a. Permits are processed and issued consistently with federal requirements;

   b. Easy capability exists to discover permit violations when they occur;

   c. The State compliance reviews are timely; and

   d. The State enforcement actions are timely, appropriate and effective.
   These detailed file audits shall be conducted by EPA in the appropriate State office annually, as funds allow. The State shall be notified thirty (30) calendar days in advance of the audit so that appropriate State officials may be available to discuss individual circumstances and problems with EPA. A copy of the audit report shall be transmitted to the State when available.

4. Implement the requirements of the State Review Framework. EPA, in concert with the Environmental Council of States (ECOS), has developed a State Review Framework that evaluates the performance of state enforcement programs. The Framework has a suggested menu of potential benefits that may be negotiated with a state that has demonstrated adequate performance, and a suggested menu identifying enhanced oversight that a region might conduct when state performance needs to be improved. This negotiation may result in more or less EPA/State interaction regarding the State's enforcement program in the future. Until the State has undergone the first review cycle of the Framework, and until that review results in an agreement between EPA and the State to a different approach, the enforcement

program review will be conducted as outlined in Section IX.1.a., b, and c above. In the year the initial review is conducted, EPA will avoid duplication with the overall NPDES program review.

5. Determine the need for (and to hold) public hearings on the State NPDES program.

B. Prior to taking any action to propose or effect any amendment, recission, or repeal of any statute, rule, or directive which has been approved by EPA in connection with the State NPDES program; any action to modify program approval documents (e.g., MOA, Program Description or Attorney General's/Independent Counsel's Statement); or any action to transfer all or any part of the approved State NPDES program to another State agency or instrument, the State shall notify the Regional Administrator and shall transmit the text of any such change to the EPA Region 4 NPDES and Biosolids Permits Section for review and approval pursuant to 40 C.F.R. § 123.62(b). The State shall keep EPA fully informed of any proposed modification or court action which acts to amend, rescind or repeal any part of its authority to administer the NPDES program. EPA acknowledges that the State has no veto authority over acts of the State legislature and, therefore, reserves the right to initiate procedures for withdrawal of the State NPDES program approval in the event that the State legislature enacts any legislation or issues any directive which substantially impairs the State ability to administer the NPDES program or to otherwise maintain compliance with NPDES program requirements.

C. A permittee shall obtain the approval of the Regional Administrator pursuant to 40 C.F.R. Part 136 before seeking authority from the State for the use of any alternative test method under N.C. Gen. Stat. § 143-215.66 and N.C. Admin. Code tit. 15A.r.2B.0500 et seq., particularly 2B.0505(e)(4) and 2B.0508(b), that has not already been approved by EPA for sampling/analyzing the quality of the discharge from a facility permitted under Section N.C. Gen. Stat. § 143-215.1 and Title 15A, Subchapter 2H.0100 et seq. of the North Carolina Administrative Code.

Section X. Computation of Time

In computing any period of time prescribed by this MOA, the day from which the designated period of time begins to run shall not be included. The last day of the period shall be included unless it is a Saturday, Sunday, or legal holiday, in which case the period extends until the next day which is not a Saturday, Sunday or legal holiday.

Section XI. Approval and Effective Date of MOA

This MOA shall take effect on the date of execution by the last signatory. If the Regional Administrator determines that any provision of this MOA does not conform to the requirements of CWA, to the requirements of 40 C.F.R. Parts 122-125, or to any other applicable federal

regulations, the Regional Administrator shall notify the State, in writing, of any proposed revision or modification which must be made to this MOA. Any proposed revision must be in writing and signed by the Director and the Regional Administrator before it becomes effective.

10-1-07
DATE

WILLIAM G. ROSS, JR.
Secretary
North Carolina Department of Environment
and Natural Resources

OCT 15 2007
DATE

J. I. PALMER, JR.
Regional Administrator
U.S. Environmental Protection Agency, Region 4