Required Submission of Loading Source Inventories

and Load Reduction Potentials

per

Falls Lake Nutrient Management Strategy

Existing Development Rule 15A NCAC 02B .278

January 31, 2013

County Manager

Mr. John Huisman, Environmental Senior Specialist
NC Division of Water Quality
1617 MSC
Raleigh, NC 27699-1617

Dear Mr. Huisman, Jan. 31, 2013

According to section 4(d) of the Existing Development Rule (15A NCAC 02B .278), *"(I)n preparation for implementation of their Stage I and Stage II load reduction programs, local governments shall develop inventories and characterize load reduction potential to the extent that accounting methods allow of the following by January 2013:*

- *(i) Wastewater collection systems;*
- *(ii) Discharging sand filter systems, including availability of or potential for central sewer connection;*
- *(iii) Properly functioning and malfunctioning septic systems;*
- *(iv) Restoration opportunities in utility corridors;*
- *(v) Fertilizer management plans for local government-owned lands;*
- *(vi) Structural stormwater practices, including intended purpose, condition, potential for greater nutrient control; and*
- *(vii) Wetlands and riparian buffers including potential for restoration opportunities"*

Attached please find Durham County's responses to the above mandate, organized according to the above breakdown and assembled by staff in Durham County's Public Health (Environmental Health Division), Engineering (Stormwater and Erosion Control Division), and Soil and Water Conservation District staff.

Please contact with any questions or regarding any clarifications regarding the included information.

Best Regards,

Drew Cummings

Drew Cummings
Assistant County Manger
Durham County, NC

1) **<u>Wastewater collection systems:</u>**

Durham County owns a pump station with force main and a Septic Tank Effluent Pump (STEP) system for the Wexford neighborhood (see map below). This system collects waste from 62 residential customers. This neighborhood's original wastewater disposal was by a state permitted community low pressure pipe system. After its failure, Durham County installed a pump station and force main to convey this wastewater to the Aqua owned and operated Hawthorne WWTP (Permit #NC0049662) located in Wake County. Durham County provides annual inspection and maintenance of the STEP pumps, and monitors the septic tank solids levels. Durham County also provides 24/7 emergency service for sewage conveyance problems within the neighborhood.

Figure 1 – Wexford Neighborhood Local and Vicinity Maps

Durham County's Triangle Wastewater Treatment Plant has very few customers located within the Falls Lake watershed. There are approximately 70 customers being served by approximately 6300 linear feet of sewer. The wastewater and nutrients from these Falls Lake Watershed customers is treated at the 12 MGD Enhanced Biological Nutrient Removal Triangle Wastewater Treatment Plant and discharged into Northeast Creek in the Jordan Lake Watershed.

2) **<u>Discharging sand filter systems, including availability of or potential for central sewer connection:</u>**

Please see Attachment A for full inventory.

3) **<u>Properly functioning and malfunctioning septic systems:</u>**

Please see Attachment A for full inventory.

4) **<u>Restoration opportunities in utility corridors:</u>**

Durham County owns and operates the Triangle Waste Water Treatment Plant located at 5926 NC Hwy 55 in southern Durham County. The majority of County-owned sewer lines and mains (and their respective utility corridors) are located in and drain to the Jordan Lake drainage basin or the Neuse River Basin below Falls Lake dam. Restoration opportunities in utility corridors in the Falls Lake basin portion of Durham County have not been inventoried.

5) **<u>Fertilizer management plans for local government-owned lands:</u>**

The Durham Cooperative Extension Horticulture Agent has trained the Durham County General Services Department (GS) as well as some of the commercial fertilizer applicators in the County. General Services is responsible for maintaining all landscaping of the entire occupied County owned property (including properties in the Falls Lake drainage basin).

Durham SWCD Staff have also assisted in the training and certification of Durham Public Schools Landscape Maintenance staff and have been assisting the school system with fertilizer and seeding recommendations for the 51 schools, approximately 1800 acres of property that they are responsible for maintaining. Other training sessions with DPS staff include; sessions on irrigation management and its impact on leaching and runoff of nutrients, Smart Controllers and new technology that could be installed to reduce water use for athletic fields. Research indicates that proper irrigation management is critical to preventing excessive runoff and nutrient losses.

Durham County staff have also been working on methods and approaches in *other* parts of the County that may eventually prove useful in reducing Falls Lake loading if applied County-wide. Per the Jordan Lake Nutrient Management Strategy Rule for Fertilizer Management (15A NCAC 02B .0272), the Durham Soil and Water Conservation District (Durham SWCD) has developed a Fertilizer Education and Outreach program that encourages homeowners to reduce fertilizer applications to their property by 40%. The *Voluntary Nutrient Reduction Program* (VNRP) emphasizes implementation of Best Management Practices (BMP's) while applying fertilizer as well as recommending that citizens apply the "Basic" rate rather than the "High" rate according to the *Carolina Lawn Manual*. BMP implementation and reduced fertilizer application rates in urban turf management will reduce or minimize impact of excess leaching and runoff in to the environment. The research indicates that implementation of BMP's while applying fertilizer have lead to improved water quality and reduce nutrient loading into surface waters in other states.

In fiscal year 2012, Durham SWCD staff met with 18 community organizations and mailed 400 brochures to citizens. The program summarizes the nutrient reductions for the Jordan and Falls lake rules and informs the landowners of the Jordan watershed of the Nutrient Management rules and recommends that they hire Certified Nutrient Applicators. The BMP recommendations of the program have been integrated into the City of Durham's pollution control program. The Durham SWCD staff has also developed a *Protect and Conserve* brochure to assist land owners with determining the irrigation that maybe necessary for proper landscape management.

6) **<u>Structural stormwater practices, including intended purpose, condition, potential for greater nutrient control:</u>**

In the Falls Lake drainage basin, Durham County has issued 18 operations and maintenance permits for permanent SWFs *(see Attachment B*). There are 7 dry detention ponds and 5 wet detention ponds that could be upgraded to constructed wetlands. The inventory also reflects an investigation of possibly installing a second BMP (another pond, level spreader, etc.) in series at each location. As required by Durham County's Stormwater Ordinance, each facility is required to submit an annual technical inspection report by a professional stating the current condition of the facility, issues, and corrective actions if needed. While none of the 2012 facility inspection reports contained major repair issues and remained compliant with the County's Stormwater Ordinance, several required attention to ground cover or minor issues.

7) <u>Wetlands and riparian buffers, including potential for restoration opportunities:</u>

The City/County Unified Development Ordinance already requires buffers which in most cases exceed the State-mandated minimums by between 50 – 100ft. Further buffer requirements have been considered, and the County is very interested in the nutrient reduction credit that will accrue to Durham City and County because of these requirements.

Since 2005, Durham County has submitted annual reports on activity within the Neuse River Basin that include 6 possible restoration opportunities. Two are located within a riparian buffer and the other four are not but are located close to riparian buffers. All are located within the Falls Lake Drainage Basin. The total nitrogen reduction possibility of these restorations is 15.31 lbs/ac/yr.

The County recently approved a set of Strategic Goals. Goal Number 4 is environmental stewardship and will require a water quality grading of all streams in Durham County. The information from this goal will assist staff in determining which streams need the most attention. Several restorations of stream buffers (Lick Creek and Sandy Creek) have already occurred. As the County's Strategic Plan efforts yield more data, additional stream restoration and other opportunities will be found.

Attachment A

County of Durham Falls Lake On-Site Septic and Sandfilter Inventory[1]

Table 1. Health Department Jurisdiction[2]

System Type	Total Systems	Failure Rate[3 4 5]	% of Total Systems	Weighted Failure %
1: Pit Privies	6	0	.075	0
2: Gravity Conv.[6]	6439	9.5[7]	80.52	7.65
3: Pump Conv.	860	6.1[8]	10.76	.66
4: LPP	685	15.8[9]	8.57	1.35
5: Pre-Treatment	6	0[10]	.075	0
6: >3000 GPD	0	0	0	0
Totals	**7996**		**100%**	**9.66%**

Table 2. DWQ Jurisdiction[11 12]

System Type	Total Systems	Public Sewer Available[13]
Filter Beds	867	525
Subsurface Drip	2	
Spray	31	
Total		**525**

[1] Loading from this inventory has not been calculated due to the lack of adequate scientific data.
[2] Properties known to be served by Health Department systems and those suspected to be served by Health Department systems were combined for the purpose of this inventory.
[3] Any system under Health Department jurisdiction with surfacing effluent is deemed a failure by virtue of the definition of failure in 15A NCAC 18A .1961.
[4] Failures are caused by hydraulic overload or maintenance failures caused by broken piping or other components.
[5] Future field surveys will better refine the failure rates currently reported.
[6] Nine hundred nineteen properties are served by systems unknown as to type. These are included in the Type 2 totals. The age of these systems would indicate this to be the most likely category for the majority of these systems.
[7] Durham County Environmental Health was unable to conduct field surveys on these systems prior to this report. The failure rate for Type 2 systems shown in Table 1 was based on a generally accepted failure rate in NC for all systems of 10%. Since the more technical systems are more prone to failure than gravity conventional systems, this rate was slightly lowered to 9.5%.
[8] The failure rate for Type 3 systems shown in Table 1 was calculated from those systems under mandated periodic inspection by Environmental Health as required in 15A NCAC 18A .1961.
[9] The failure rate for Type 4 systems shown in Table 1 was calculated from those systems under mandated periodic inspection by Environmental Health as required in 15A NCAC 18A .1961. Sixty-three systems are currently managed with ten experiencing failures for a failure rate of 15.8%.
[10] The failure rate for type 5 systems shown in Table 1 was calculated from those systems under mandated periodic inspection by Environmental Health as required in 15A NCAC 18A .1961.
[11] Properties known to be served by DWQ systems and those suspected to be served by DWQ systems were combined for the purpose of this inventory.
[12] Failure Rates are not reported for the DWQ systems shown in Table 2 as these systems are not under County Health Department jurisdiction.
[13] All structures within 60' of existing public sewer gravity lines currently served by DWQ systems are deemed as having connection available.

Attachment B

List of Durham County Permitted SWF in Fall Lake Drainage Basin							
Durham County Facility ID	PIN	Name of Facility	Address	Permit Issuance Date	BMP Type	Possible Retrofit?	Room for Additional BMP?
SW-0802	0870-02-31-8413	Progress Energy	3016 Coley Road	6/24/2009	Dry	Yes	Yes
SW-0803	0840-04-80-8978	North State Storage	2013 Sherron Rd	9/8/2008	Wet	Yes	No
SW-0809	0803-02-89-1503	Eno Falls Subdivision	19 Greylee Dr. nr Rivermont Rd.	5/2/2007	Dry	Yes	No
SW-0814	0855-03-15-5200	Organon Teknika BioMeurix Inc.	150 Akzo Blvd.	8/20/2008	Dry	Yes	Yes
SW-0815	0845-04-33-8138	Becton Dickinson Expansion	1 Becton Circle	12/16/2009	Wet	Yes	No
SW-0817	0845-02-58-9335	Merck North, South, SW Ponds	5325 Old Oxford Road	6/24/2009	Wetland	Yes	Yes
SW-0819	0815-04-90-2925	Springs of Life Bible Church	5301 Guess Road	6/5/2006	Dry	Yes	Yes
SW-0828	0833-02-78-4555	119 Wolfpack Drive	119 Wolfpack Dr.	12/8/2006	Wet	Yes	No
SW-0833	0759-02-55-6482	Eagles Mart	4808 US Highway 70	6/14/2008	Wetland	No	
SW-0836	0845-04-53-3601	Carolina Mechanical Services, Inc	5010 International Drive	1/26/2006	Wet	Yes	Yes
SW-1002	0834-02-89-1636	Edgewood Baptist	1804 Infinity Road	4/19/2009	Wetland	No	No
SW-1004	0845-02-58-9335	Merck Temp. Construction Staging	5325 Old Oxford Rd.	6/24/2009	Dry	Yes	Yes
SW-1007	0845-02-58-9335	Merck VMF- Ph 1B	5325 Old Oxford Rd.	7/15/2010	Wetland	Yes	Yes
SW-1013	0828-01-98-4127	Praise and Deliverance Church	10855 Quail Roost Rd	12/22/2009	Dry	Yes	Yes
SW-1017	0840-04-64-9239	LKQ - Auto Salvage	1301 South Miami Boulevard	2/18/2010	Wet	Yes	No
SW-1031	0835-02-57-2763	New Middle School B (Treyburn Middle School)	800 Vintage Hill Parkway	6/1/2011	Bioret	No	No
SW-1054	0840-04-71-4495	Family Dollar	Hwy 98	3/21/2012	Cisturn	No	Yes
SW-1055	0860-01-39-9951	Olive Branch Baptist Church	123 Olive Branch Road	8/4/2011	Dry	Yes	Yes