Table of Contents

Background ...................................................................................................................... 2
Stage I Load Reduction Programs .................................................................................. 2
  Wastewater Collection Systems .................................................................................. 2
  Discharging Sand Filter Systems ............................................................................... 2
  Septic Systems ........................................................................................................ 2
  Utility Corridors......................................................................................................... 3
  Fertilizer Management Plan ...................................................................................... 3
Structural Stormwater Practices ...................................................................................... 4
  Wetlands and Riparian Buffers ............................................................................... 4
Conservation Areas Identified ........................................................................................ 5

APPENDICES
  • Appendix A. Wastewater Collection System – City of Creedmoor
  • Appendix B. Nutrient Load Reduction Programs Reference Map
  • Appendix C. Fertilizer Management Plan – City of Creedmoor
Background
The Falls Lake Nutrient Management Strategy, developed and enforced by the North Carolina Department of Environment and Natural Resources (DENR), requires that local governments of jurisdictions within the Falls Lake watershed develop programs to reduce nutrient loading in the receiving waterbody. There are two stages to the strategy, the first of which requires each jurisdiction to submit, by January 31, 2013, inventories characterizing the load reduction potential for six primary programs.

This document fulfills the Stage I load reduction inventory requirements under 15A NCAC 02B .0278(3), and describes the City of Creedmoor’s opportunities for load reduction through the six means or techniques described in that section. It is submitted by the City of Creedmoor for approval by the Commission.

Stage I Load Reduction Programs
The Falls Lake Nutrient Management Strategy identifies six specific areas in which load reductions may be achieved. Under Stage I of the programs, local governments must develop inventories and characterize load reduction potential (to the extent that accounting methods allow) for each. The City of Creedmoor’s programs and the associated load reduction potential are described below.

Wastewater Collection Systems
Nutrient loading can be reduced through the improvement of wastewater collection systems. Specifically, proper system maintenance will result in a reduction in both dry weather leaks to surface water and wet weather overflows, which will in turn reduce nutrient loading.

The City of Creedmoor is responsible for its own wastewater collection system, approximately 240,260 feet of infrastructure, although it purchases treatment capacity from the South Granville Water and Sewer Authority (SGWASA). Currently, the City is completing a nearly $10 million Water and Sewer Infrastructure Project, funded in part by grants from the U.S. Department of Agriculture. The project involves replacing 27,400 feet and reconditioning 1,400 feet of aging sewer lines, where leaks and breaks cause problems, as well as performing valve replacements and service tie-ins.

For reference, the map included as Appendix A displays the wastewater collection system throughout the City of Creedmoor.

Discharging Sand Filter Systems
There are no discharging sand filter systems within the City of Creedmoor. Therefore, there is no opportunity to achieve load reduction within this program.

Septic Systems
An inventory of septic systems throughout the City of Creedmoor is included in the Person and Granville County Septic System Field Performance Assessment, being completed by NC State University. The results of this assessment will be presented under a separate cover from this inventory.
Utility Corridors

Utility corridors are commonly mowed areas surrounding above-ground components of utility infrastructure. Restoration of barren or grassy utility corridors to those supporting hardier vegetation could reduce runoff via interception and consequently reduce nutrient loading. According to the Jordan/Falls Lake Stormwater Nutrient Loading Accounting Tool, the conversion of managed pervious cover (the assumed cover for utility corridors) to forested cover will yield load reductions of .85 lbs/ac/yr of N and .18 lb/ac/yr of P.

The City of Creedmoor has limited to no opportunities to replace or supplement existing vegetation with species which will reduce runoff in utility corridors. The reason is that in preliminary discussions with the utilities involved, they have expressed strongly that the current corridors are already cleared to the minimum widths that the utility requires. The power utilities sustain heavy fines from the Federal government for any outages that are attributable to vegetation.

Since this reduction would be contingent upon the application of a conservation easement on the land, as well as an agreement from an operational perspective that the utility could provide its services with a narrower easement, it is unlikely that significant reductions can be achieved from revegetation.

Fertilizer Management Plan

In many cases, fertilizers containing nutrients such as phosphorus, nitrogen, and potassium are applied to managed vegetation in excess of levels that can be taken up by the grass. Stormwater runoff can quickly transport remaining nutrients to receiving waterbodies. For local government-owned properties, this nutrient loading can be reduced with a variety of strategies, addressing fertilizer composition, application, and maintenance.

The City of Creedmoor has implemented a fertilizer management plan for its properties, totaling 327.7 acres, within the city’s jurisdictional boundary.

Specifically, the City of Creedmoor’s Fertilizer Management Plan specifies management practices such as:

- Soil sample testing prior to application of any supplemental fertilizer products to determine the need for supplemental fertilizer;
- Supplemental fertilizer products containing phosphorus may not be applied;
- The City shall maintain a buffer zone of low maintenance grasses along surface water bodies;
- The City will consider using Fe (Iron) as a supplement to Nitrogen only fertilizer products for greening response;
- Public Works Personnel shall time applications of supplemental fertilizer carefully. Fertilizer shall not be applied before a heavy rainfall;
- The City will recycle grass clippings to reduce the amount of fertilizer needed to produce healthy turf; and
- The City will use a drop spreader near surface water bodies.

The City of Creedmoor’s complete Fertilizer Management Plan is contained in Appendix C. It was written in accordance with a State-approved model, and nutrient loading will be calculated based on the
Jordan/Falls Lake Stormwater Nutrient Loading Accounting Tool. The plan was adopted by the Board of Commissioners on October 8, 2012. While it has not historically been the City’s general practice to uniformly fertilize these properties, there has never been a formal fertilizer management plan in place. Application of supplemental fertilizer has occurred on a case by case basis, and has been applied at the direction of the Public Works Director. Ball fields that are City-owned are leased during the warmer months of the year. As a result of adopting the enclosed Fertilizer Management Plan for City Owned Properties, the City will begin requiring parties who lease City-owned properties to sign an advised consent form pledging not to apply fertilizer to the land beginning in the spring 2013.

**Structural Stormwater Practices**

There are opportunities for retrofitting of BMPs (per DENR’s Stormwater Best Management Practices Manual) throughout the City of Creedmoor to reduce nutrient loading. There are more than twenty-eight acres of retrofit opportunities involving BMPs implemented under water supply/watershed rules that are identified on the map in Appendix B. The majority of opportunities involve “farm ponds” that have been utilized to address volume reduction, rather than nutrient management. The following table describes three practices that have been identified as prime candidates for potential retrofitting, and the associated nutrient loading reduction anticipated through retrofitting.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Intended Purpose</th>
<th>Area Impacted</th>
<th>Potential for Nutrient Control*</th>
<th>Condition</th>
<th>Retrofit Possibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet Pond</td>
<td>Stormwater control for 18 acres</td>
<td>Creedmoor Crossing shopping center</td>
<td>TN – 25%</td>
<td>Fair</td>
<td>Likely</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TP – 40%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Detention Basin</td>
<td>Peak Shaving collection pond for ~1 acre of land</td>
<td>Cardinal Bank parking lot and surrounding area</td>
<td>TN – 35%</td>
<td>Poorly constructed; no forebay provided and inlet location is improperly located</td>
<td>Fair – erosion at roadside is creating a sinkhole</td>
</tr>
<tr>
<td>Wet Pond</td>
<td>Stormwater control for ~35 acres</td>
<td>C&amp;R Mobile Home Park</td>
<td>TN – 25%</td>
<td>Poor; Requires dredging and needs weir</td>
<td>In negotiations</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TP – 40%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Source: NCDENR Stormwater BMP Manual

**Wetlands and Riparian Buffers**

Local governments may restore riparian buffers on developed or agricultural lands where riparian zones are currently under cultivation or other managed vegetative cover. The City of Creedmoor has not been able to identify any significant opportunities for riparian buffer or wetlands restoration in the jurisdiction.
Conservation Areas Identified

The City of Creedmoor owns significant acreage (114.39 acres) north and south of Brassfield Road (SR 1700), adjacent to the proposed Fontaine Subdivision (152 proposed residential building lots identified on the preliminary plat approved in April 2011). The conservation lands were acquired by the City in December 2011 as a stormwater control mechanism and in order to preserve large tracts of open space. The location of each of the conservation properties is identified on the map in Appendix B.

On the Northern side of Brassfield Road, 25.43 acres of land located partially in Flood Zone AE, are reserved for conservation and passive recreational opportunities. A combined 10.81 acres of land in the adjacent westward parcel belong to the City of Creedmoor as well – placed in permanent conservation easement with little or no recreational use proposed. South of Brassfield Road, the City acquired 78.15 acres of land reserved for conservation with very limited passive recreational activity proposed (dirt or earthen greenway trails are proposed in this undeveloped tract which maintains the heavily wooded characteristics native to this portion of the transitional area between the urban landscape and the more rural Granville County environs).
A RESOLUTION ADOPTING A FERTILIZER MANAGEMENT PLAN FOR CITY-OWNED PROPERTIES WITHIN THE CITY OF CREEDMOOR

WHEREAS, The Falls Lake Rules were adopted by the Environmental Management Commission in January 2011 to restore water quality in the lake by reducing the amount of pollution entering upstream; and

WHEREAS, It has been determined by North Carolina Department of Environment and Natural Resources, Division of Water Quality (NCDENR-DWQ) that the nutrients found in supplemental fertilizer products commonly used for lawn care and horticultural purposes, most specifically Nitrogen and Phosphorus, can contribute in a significant manner to an increase in chlorophyll-a within the lake; and

WHEREAS, The City of Creedmoor recognizes overuse of fertilizer products can create unhealthy soil conditions and promote lawn disease, and can contaminate rivers and streams by dissolving in rainwater and running off into nearby ditches, storm drains, and other conveyances as stormwater runoff; and

WHEREAS, 15A NCAC 02b .0278 FALLS WATER SUPPLY NUTRIENT STRATEGY: STORMWATER MANAGEMENT FOR EXISTING DEVELOPMENT, Section (4)(d), the City is required by the NCDENR-DWQ to establish uniform operating policies to regulate the application of fertilizer to city-owned properties; and

WHEREAS, the goal of this Fertilizer Management Plan for City-owned Properties is to provide sufficient supplemental nutrients required for turf and horticultural health and quality while minimizing environmental risk from offsite movement of nutrients considered responsible for contributing to the eutrophic condition of Falls Lake;

NOW THEREFORE, BE IT RESOLVED, that on this the 8th day of October, 2012, the Creedmoor Board of Commissioners adopt the following fertilizer management plan for city owned properties:

CITY OF CREEDMOOR FERTILIZER MANAGEMENT PLAN FOR CITY OWNED PROPERTIES

Purpose
As per 15A NCAC 02b .0278 FALLS WATER SUPPLY NUTRIENT STRATEGY: STORMWATER MANAGEMENT FOR EXISTING DEVELOPMENT, Section (4)(d), the City is required by the North Carolina Department of Environment and Natural Resources, Division of Water Quality (NCDENR-DWQ) to establish uniform operating policies to regulate the application of fertilizer to city-owned properties. The goal is to provide sufficient supplemental nutrients required for turf and horticultural health and
quality while minimizing environmental risk from offsite movement of nutrients considered responsible for contributing to the eutrophic condition of Falls Lake.

Goals of this Plan

- To fully comply with the Nutrient Management Strategy for Falls Lake
- To adequately supply nutrients for plant production and lawn maintenance on city owned/maintained property assets
- To properly utilize chemical fertilizer products as a plant nutrient source
- To minimize nonpoint source pollution of surface water resources
- To maintain or to improve the physical, chemical and biological condition of the soil by encouraging best management practices (BMPs)

Basic Policy

The Falls Lake Rules were adopted by the Environmental Management Commission in January 2011 to restore water quality in the lake by reducing the amount of pollution entering upstream. The rules are a staged nutrient management strategy designed to reduce nutrient discharges to the lake from various sources, including stormwater runoff from new and existing development, wastewater treatment plants and agriculture.

It has been determined by NCDENR-DWQ that the nutrients found in supplemental fertilizer products commonly used for lawn care and horticultural purposes, most specifically Nitrogen and Phosphorus, can contribute in a significant manner to an increase in chlorophyll-a within the lake. The City, located entirely within the Falls Lake Watershed, has been charged by NCDENR-DWQ under the Falls Lake Rules with reducing the Nitrogen component of stormwater runoff by 40% and the Phosphorus component by 77% as part of the overall Falls Lake Nutrient Management program. This fertilizer management plan is one component of a comprehensive approach to meeting the minimum requirements imposed by the Falls Rules.

The City of Creedmoor recognizes overuse of fertilizer products can create unhealthy soil conditions and promote lawn disease. Fertilizer can contaminate rivers and streams by dissolving in rainwater and running off into nearby ditches, storm drains, and other conveyances as stormwater runoff. This runoff can lead to increased algae and aquatic plant growth which can have negative effects on water quality, fisheries, recreation, and property values.

This policy regulates supplemental application of fertilizers for City-owned lands, including but not limited to Lake Rogers Park, City Hall and Police Department, Harris Park, the Wastewater Lagoon, City-owned pump stations, the water tower sites, the City Gym and Activity Center, Battle Roberts Field, the city Public Works building, and the Conservancy Properties (Brogden Road, Washington Avenue, Brassfield Road). A map indicating the location of City-owned assets accompanies this plan. This policy applies uniformly to properties owned and maintained by the City of Creedmoor, and to city-owned assets leased to either Granville County Government or to other interested parties.

Use of Supplemental Fertilizer Products for City of Creedmoor-owned Lands

1. No supplemental fertilizer products containing Phosphorus may be applied to established lawns on property assets owned by the City of Creedmoor.
2. City Public Works staff shall conduct soil sample testing prior to application of any supplemental fertilizer products to horticultural plantings or to City-owned trees to determine the need for supplemental fertilizer.
3. Soil samples shall be analyzed by the Agronomic Division of the North Carolina Department of Agriculture and Consumer Services (referred to in this policy as "the state soil lab"), located at 4300 Reedy Creek Road, Raleigh, NC 27607. Additional information may be obtained online http://www.ncagr.gov/agronomi/ or by calling (919)733-2655.

4. When a soil test indicates phosphorus is needed, or for new turf establishment using seed or sod, the product utilized shall contain Nitrogen to Phosphorus ratio of 5:1 or greater.

5. If supplemental fertilizer is required, but Phosphorus is not deemed necessary by samples analyzed by the state soil lab, City Public Works staff involved in the application of chemical fertilizers shall apply only products containing zero Phosphorus.

6. City Public Works personnel shall not apply fertilizer products to frozen soil or soil saturated with water. Fertilizer shall not be applied either immediately preceding or following a heavy rain event.

7. Any fertilizer released onto a hard surface, such as a sidewalk, street, or driveway, shall be cleaned up promptly.

8. Public Works personnel shall maintain at least a 15 foot application buffer from any surface water (ditch, stream). If a spreader guard, deflector shield, or drop spreader is used in the application of fertilizer, a minimum of a 3 foot buffer shall be maintained from any water body.

**Recommended BMPs for Water Quality Protection**

- Base fertilization practices on soil testing performed by the state soil lab
- Minimize fertilizer rates on slopes
- Maintain a buffer zone of low maintenance grasses along surface water bodies
- Consider using Fe (Iron) as a supplement to Nitrogen for greening response
- Time applications of supplemental fertilizer carefully. Do not apply fertilizer before a heavy rainfall
- Avoid over-irrigation of lawns and horticultural plantings
- Recycle grass clippings to reduce the amount of fertilizer needed to produce healthy turf
- Use a drop spreader near surface water bodies
- Sweep or blow fertilizer off of impervious surfaces and back onto turf

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**ATTEST:**

Korena Weichel, Administrative Services Director/City Clerk

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Resolution 2012-R-10
Page 3 of 3