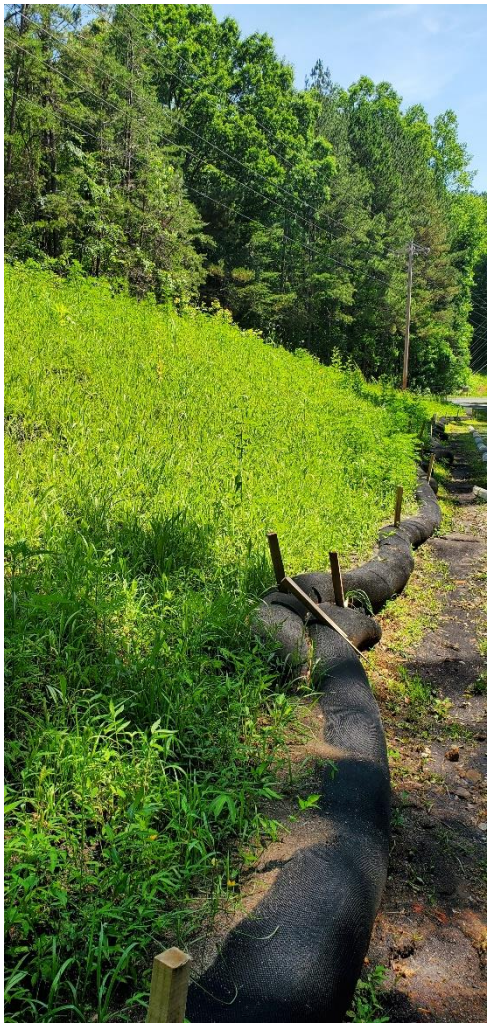
TOWN OF HILLSBOROUGH | STORMWATER MANGAGEMENT PROGRAM

Comprehensive Stormwater Management Plan

NPDES Phase II MS4 Permit #NCS000466 Updated December 2022



The Stormwater and Environmental Services Division oversees the town's stormwater management program and stormwater utility.

The mission of this program is to reduce stormwater runoff pollution reaching the Eno River.

Only Rain Down the Drain

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INTRODUCTION

Why Care About Stormwater?

Adding impervious surface decreases the amount of stormwater that infiltrates into the ground. This increases the amount and velocity of stormwater runoff. This can cause accelerated erosion and downstream flooding. In addition, as stormwater flows across impervious surfaces, it picks up various pollutants. These include excess nutrients, oil and grease, bacteria and sediment. Polluted stormwater flows down storm drains and ditches where it is discharged, untreated, into local streams, rivers, and lakes. Stormwater runoff pollution causes adverse impacts to aquatic ecosystems, poses human health risks, and can greatly increase the cost of treating drinking water.

Program Background

In 1972, the National Pollutant Discharge Elimination System (NPDES) program was established under the authority of the Federal Clean Water Act. Phase I of the NPDES Stormwater program was established in 1990. It required NPDES permit coverage for municipalities with populations of 100,000 or more.

Phase II of the NPDES Stormwater program was signed into law in December 1999. The Phase II program extended permit coverage to smaller (< 100,000 pop.) communities and public entities that own or operate a municipal separate storm sewer system (MS4). It required these smaller communities to develop a stormwater program and obtain an NPDES permit for stormwater discharges.

In North Carolina, the Department of Environmental Quality (NCDEQ) administers the NPDES Stormwater program. NCDEQ issued the Town of Hillsborough's (Town) initial Phase II permit, on October 1, 2005. The permit required the Town to develop, implement, and enforce a stormwater program designed to reduce the discharge of pollutants from the MS4 to the maximum extent practicable. The program was implemented in phases over five years of the initial permit. Pursuant to the permit the stormwater program included the following six minimum measures or best management practices (BMPs):

1. Public education and outreach on stormwater impacts;
2. Public involvement/participation;
3. Illicit discharge detection and elimination;
4. Construction site stormwater runoff control (Erosion Control);
5. Post-construction stormwater management for new development and redevelopment;
6. Pollution prevention for municipal operations.

The Town's current permit, Number NCS000466, was issued on February 27, 2017. This comprehensive stormwater management plan has been updated to meet the current permit requirements.

1. Storm Sewer System Information

1.1 Population Served

Estimated population served..... 9,660[1]

1.2 Growth Rate

Estimated increase 2010-2020 ..... 58.7%[2]

1.3 Jurisdictional Area

Town Limits ..... 5.7 sq. mi

ETJ..... 3.5 sq. mi.

1.4 MS4 Conveyance System

Due to the age of the town, the MS4 consists of a variety of stormwater conveyances and components. These range from typical curb and gutter systems conveyed by concrete pipes to various ditches and swales. The predominate conveyance components include grass lined swales and vegetated drainage ditches with various cross pipes and culverts. The Town's MS4 also includes seven town owned stormwater control measures (SCM).

MS4 system components have been mapped, including stormwater outfalls. Mapped MS4 components are included in a Geographic Information System (GIS) database. This data is periodically updated in accordance with the Town's *Illicit Discharge Detection and Elimination Plan*, included in the Appendix B of this document.

Components of the Town's MS4 are periodically inspected to ensure proper function. Inspection procedures are currently being updated and will be included as an appendix to this document when finalized. Town owned SCMs are inspected at least annually as part of the town's required pollution prevention and good housekeeping program. The Town's *and Pollution Prevention/Good Housekeeping Plan* is included as Appendix C of this document.

The North Carolina Department of Transportation (NCDOT) maintains stormwater conveyance systems within state road rights-of-way, even those within town limits. Stormwater systems located on private property, including privately owned SCMs are maintained by the landowner. The Town does require privately owned SCMs to be inspected annually. Annual maintenance inspection reports are due to town stormwater staff by September 1 of each year. As detailed in *Section 7.5* of this

[1] April 2020 US Census Bureau, 2020 Census, PL94-171 as provided by the North Carolina Office of Budget and Management, State Demographics Data, http://www.osbm.state.nc.us/.

[2] Percentage increase from 2010 to 2020 (April 2020 Us Census Bureau, 2020 Census PL94-171 as provided by the North Carolina Office of Budget and Management, State Demographics Data, http://www.osbm.state.nc.us/.

document, town staff does conduct audits of privately owned SCMs to help ensure compliance.

1.5 Land Use Composition

Estimated Land Use[3]

Residential..... 36%

Commercial 30%

Industrial..... 5%

Open Space..... 29%

Total 100%

1.6 TMDL Identification

Currently, no streams flowing into or out of the Town of Hillsborough's jurisdiction have an associated Total Maximum Daily Load.

1.7 Target Pollutants

By identifying target pollutants, the stormwater program can be tailored to specific issues within the town's jurisdiction. It allows resources to be focused on reducing stormwater impacts occurring locally. Using a targeted approach to stormwater program components (described in *Section 7*) is more effective and economical than a broader approach.

As indicated in *Section 1.5* above, land use within the town's jurisdiction is composed primarily of residential and commercial uses. Target pollutant sources from these land uses include:

Excess nutrients – the Town is located within an NSW. Excess nutrients can lead to high algal growth in downstream waterbodies causing low oxygen levels.

Sediment – the Piedmont region of North Carolina is known for erodible clay soils. Sediment can adversely impact waterways and aquatic environments. For new construction, erosion control is necessary to keep sediment on site. For post-construction sediment reduction, maintaining vegetative cover on SCMs and other pervious areas is an important issue.

Litter/Yard Waste – Litter and yard waste can block stormwater conveyances. As litter and yard waste decompose it introduces chemicals and additional nutrients into the storm system.

[3] Land use percentages were estimated from the Town of Hillsborough Land Use GIS database. Area of parcels for each designated land use type were summed and calculated for relative percentage of the planning jurisdictional area.

General Household and Landscape Chemicals – this includes fertilizers, pesticides, automotive chemicals, and detergents which can cause significant impacts to aquatic environments.

1.8 Target Audience

Two primary target audiences have been identified, local citizens and business owners. Local citizens include single-family residences, churches, schools, and other civic groups. Business owners, especially restaurants, and developments with high impervious surfaces will be targeted.

2. Receiving Streams

The Town of Hillsborough lies entirely within the Falls Lake Watershed, which is part of the Neuse River Basin. Specifically, the town drains to the Eno River. Receiving waters are listed below.

Receiving Stream	Description	Classification	Index No.
Eno River (Corporation Lake, Lake Ben Johnston)	From a point 0.4 mile upstream of Dry Run to dam at Lake Ben Johnston (Orange County water supply intake & Town of Hillsborough water supply intake)	WS-II; HQW, CA, NSW	27-2-(3.5)
Eno River	From dam at Lake Ben Johnston to Orange County SR 1561	C; NSW, N	27-2-(7)
Seven Mile Creek	From a point 0.4 mile upstream of I-85 to Lake Ben Johnston, Eno River	WS-II; HQW, CA, NSW	27-2-6-(1.5)
Rocky Run	From a point 0.5 mile upstream of I-85 to Seven Mile Creek	WS-II; HQW, NSW	27-2-6-2-(2)
Cates Creek	From source to Eno River	C; NSW	27-2-8
Strouds Creek	From source to Eno River	C; NSW	27-2-9
Stony Creek	From source to a point 0.4 mile upstream of Orange County SR 1710	C; NSW	27-2-13-(1)

3. Existing Water Quality Programs

3.1 Local Programs

The following programs and ordinances are being implemented within the Town of Hillsborough's jurisdiction.

Unified Development Ordinance (UDO) – regulates overall development and land use. Specific water quality aspects include riparian buffer rules and post construction stormwater requirements, including nutrient limits.

Flood Damage Prevention – through its UDO the Town protects water quality by preventing new development within flood hazard zones.

Local Nutrient Sensitive Waters (NSW) Strategy – through its UDO the Town adopted stormwater requirements for new development to meet the Falls Lake Nutrient Management Strategy (Falls Lake rules).

Delegated Neuse Riparian Buffer Program – The Town of Hillsborough requested and received delegated authority from the state to enforce the states' Neuse Riparian Buffer Program within the Town's planning jurisdiction.

Delegated Erosion and Sediment Control Program – as noted in *Section 6*, the Town relies on Orange County to conduct an erosion control program. Orange County has local delegated authority from the state.

3.2 State Programs

State programs, including the Neuse Riparian Buffer rules and the Falls Lake Rules are implemented at a local level. The Town of Hillsborough does rely on NCDOT to maintain stormwater facilities and programs within state-owned road rights-of-way.

4. Permitting Information

The Town's Stormwater Program is under direction of the Town's Stormwater and Environmental Services Manager. Stormwater and Environmental Services is a division of the town's Planning Department. In addition to working with the Planning Department, the Stormwater and Environmental Services Division also works closely with Public Works, Utilities and Public Spaces departments/divisions. The Stormwater and Environmental Services Manager is supervised by the Assistant Town Manager/Planning Director.

4.1 Responsible Party Contact List

Overall implementation and oversight of the Town's Stormwater Program is managed by:

Terry Hackett, Stormwater and Environmental Services Manager
Town of Hillsborough
P.O. Box 429
101 E. Orange Street
Hillsborough, NC 27278
Telephone: 919-296-9621
Email: terry.hackett@hillsboroughnc.gov

4.2 Organizational Chart

The Town's organization chart is included in Appendix A.

4.3 Signing Official

The Town of Hillsborough operates under a council-manager form of government. The town manager is responsible for management and oversight of the Town's daily operations. Contact information is listed below:

Eric Peterson, Town Manager
Town of Hillsborough
101 E. Orange Street,
P.O. Box 429
Hillsborough, NC 27278
Telephone: 919-296-9421
Email: eric.peterson@hillsboroughnc.gov

4.4 Duly Authorized Representative

Not applicable.

5. Co-Permit Status Information

The Town of Hillsborough holds its own NPDES Phase II permit and does not co-permit with another entity.

6. Reliance on Another Entity

The Town of Hillsborough utilizes Orange County to implement the Construction Site Stormwater Runoff Control (i.e. erosion control) portion of its stormwater program.

6.1 Name of Entity

Orange County

6.2 Elements Implemented

Construction site stormwater runoff control (erosion control).

6.3 Contact Information

Orange County Erosion Control Program:	Patrick Mallet, Erosion Control Supervisor Orange County Planning and Inspections Department 131 W Margaret Lane, Suite 201 Hillsborough, NC 27278 919-245-2577 pmallett@orangecountync.gov

6.4 Legal Agreement

The Town maintains an inter-local agreement with Orange County to provide erosion control services. The current agreement was approved in October 2012.

7. Stormwater Management Program Plan

The following sections describe the Town's stormwater management program, objectives and measurable goals for each BMP. Measurable goals are based on the Town's current NPDES Phase II permit and modifications needed to best meet the objectives of the Town's Stormwater Program. While the six BMPs are not expected to change over the life of this stormwater management plan, measurable goals may be modified, removed, or new goals added. Changes may be necessary to increase effectiveness reducing impacts to the MS4, changes in resources, or to meet permit renewal changes. Modifications to these goals will be documented within the required annual report.

7.1 Public Education and Outreach

The objective of the Town's stormwater public education and outreach program is to increase citizen awareness of stormwater runoff pollution and related issues. The Town's stormwater public education and outreach program includes dissemination of educational materials, publication of *The Stormwater Almanac* newsletter, various school programs, and membership in the Clean Water Education Partnership.

Measurable Goals

- Develop and Distribute Materials

  Develop educational materials or modify/utilize existing materials available from other agencies. Distribute educational materials through educational programs, local events, directly with targeted businesses and place informational flyers at Town Hall and the Orange County Library. Materials will also be distributed electronically.

- Electronic Media

  Maintain a stormwater website that includes education and outreach materials. The website is updated as necessary. The Town also maintains specific Facebook and Twitter accounts for the stormwater program. Posts on social media are made weekly. Below are the internet addresses for the Town's stormwater website and social media accounts.

  Website..... www.hillsboroughnc.gov/stormwater

  Facebook..... https://www.facebook.com/ToHGovSW/

  Twitter..... https://twitter.com/ToHGovSW

- Stormwater Newsletter

  Write articles and publish *The Stormwater Almanac* a local newsletter developed by stormwater staff, two to four times annually. Paper copies of the newsletter will be distributed at various events and educational programs. Electronic versions of *The Stormwater Almanac* will be distributed through the

Town's website. Notifications when a new issue is published will be posted on the Town's stormwater social media accounts. Stormwater staff will also work with the Town's public information officer to issue a press release when a new issue is available.

- School Programs

  Conduct stormwater related programs for local schools. This includes partnering with other local governmental agencies conducting environmental education programs for local schools. Programs include annual Earth Walk with local seventh grade students, Eno River field trip with Orange High AP Environmental/Earth Science classes, science night at The Expedition School, as well as other programs as requested. This program also includes continued support of the "eco-classroom" at C.W. Stanford and Orange High Schools, which has a strong stormwater education component.

- Clean Water Education Partnership

  The Town of Hillsborough is a member of the Clean Water Education Partnership (CWEP). CWEP leverages resources from multiple local governments to conduct educational and outreach programs geared towards reducing stormwater runoff pollution and clean water. Programs include mass media campaigns such as television, radio, internet, and printed materials. CWEP also conducts direct education at various local events through the region. Town stormwater staff actively serves on the CWEP steering committee.

- Civic Groups

  The Town provides stormwater education and outreach programs/materials to various civic groups. These programs are typically on an "as requested basis." Civic groups include local scout units, homeowner associations, churches and other various groups. Stormwater staff targets homeowner associations through its audits of SCMs. This provides regular opportunities for stormwater education with local citizens. Educational information is also provided to local businesses often as part of the Town's illicit discharge elimination program. Periodically stormwater staff conducts workshops for civic groups. The feasibility of conducting workshops for civic groups will be evaluated periodically and scheduled as interest and resources allow.

Evaluation

The Town's Public Education and Outreach program is evaluated by assessing progress towards each measurable goal listed above. Information and data towards completion of each measurable goal is tracked in a database. Information tracked includes the number of materials distributed, number students attending school programs, the number of newsletters published, etc. Progress is reported each year in the annual report to the NCDEQ.

7.2 Public Involvement and Participation

The objective of the Town's public involvement and participation program is to strengthen citizen engagement in stormwater and environmental issues affecting the Town. Public Involvement and participation includes providing volunteer opportunities, participating in local events and festivals, exchanging information with citizens and elected officials, and providing public assistance on stormwater related issues.

Measurable Goals

- Volunteer Opportunities

  Town stormwater staff will seek out and coordinate volunteer opportunities to raise awareness of stormwater runoff pollution, engage citizens and ultimately reduce target pollutants. Ongoing volunteer opportunities and measurable goals are outlined below.

  Litter Cleanup – coordinate at least one community litter/trash clean up annually. Stormwater staff will provide supplies and arrange for trash disposal by the Town's Public Works Department.

  Plantings and/or Invasive Species Removal – coordinate at least one volunteer workday annually that includes planting projects within SCMs, riparian buffers, slope stabilization, parks and other open space. Plantings may include trees, wetland plants, erosion control plantings etc. Invasive species removal may also be included as an event.

  Pollinator Garden – provide technical support and stormwater education to a local garden club that has adopted the Gold Park bioretention as a pollinator garden. Volunteers hold one workday/month. Town stormwater staff will also provide support to a similar pollinator/rain garden in Cates Creek Park.

  Gold Park Wetland – coordinate at least one annual vegetation maintenance event at the Town's stormwater wetland in Gold Park. Stormwater staff will provide instruction and general information on the function of the wetland. Volunteers will remove invasive species, cattails, undesirable woody species, trash, and debris.

- Orange County Creek Week – participate and promote Orange County's Creek Week. Stormwater staff will coordinate/host at least two events during the week.

- Outreach Events/Festivals

  Participate in various local events and festivals. This may include Hog Day Festival, Eno River Festival, Last Friday's and other events/festivals. Specifically, stormwater staff will participate in Orange County's "Earth Evening" which is an "Earth Day" celebration coordinated with Hillsborough's Last Friday event in April. Stormwater staff will set-up displays and table-top

demonstrations, hand out information to the public regarding stormwater impacts, and answer citizen questions.

- Informational Website and Hotline

  Provide stormwater content and information for the Town maintained website. Include contact information for citizens to report concerns or make requests. Respond to citizen requests as warranted through the online contact form, general email, social media, and telephone.

- Town Board of Commissioners Input

  At a minimum, Town stormwater staff will present one update to Hillsborough's elected Town Board of Commissioners regarding the stormwater program and seek input on pertinent issues. Stormwater staff may provide presentations to other Town advisory boards as requested.

Evaluation

The Town's Public Involvement and Participation program is evaluated by assessing progress towards each measurable goal listed above. Information and data towards completion of each measurable goal is tracked in a database. Information tracked includes number of volunteers, amount of area cleaned, amount of area planted, number of plants, number of citizen assistance requests received/resolved, etc. Progress is reported each year in the annual report to the NCDEQ.

7.3 Illicit Discharge Detection and Elimination

The Town's stormwater illicit discharge detection and elimination program is outlined in its *Illicit Discharge Detection and Elimination Plan.* This plan details measures that Town staff follows to find and eliminate illicit discharges and connections to the MS4. Other components of this program include employee cross-training, updating mapping, and evaluating funding sources to expand the program. The plan also lists measurable goals for this program and how it is evaluated. A copy of the plan is included in Appendix B.

7.4 Construction-Site Stormwater Runoff Control

Orange County implements and enforces construction site stormwater runoff control for the Town of Hillsborough through its erosion control program. Orange County has local delegated authority from NCDEQ to implement an erosion control program. Orange County completes erosion control plan review, issues land disturbance permits, and inspects permitted construction sites within the Town's jurisdiction of privately funded development projects. Projects involving the use of public funds are permitted and inspected by NCDEQ.

Regulatory Mechanism

The Town of Hillsborough and Orange County have an approved inter-local agreement allowing Orange County to enforce its sedimentation and erosion control ordinance within the Town's jurisdiction.

Measurable Goals

- Site Audits

  Town stormwater staff will periodically conduct site audits of active construction sites to assist county staff with erosion control compliance. Issues or violations will be communicated to Orange County erosion control staff. This additional oversight helps to ensure all active construction sites maintain compliance with approved erosion control plans.

Evaluation

The Orange County Erosion Control Division maintains a database and inspection reports on each permitted construction site. Information regarding number of sites, acreage of disturbance, compliance, notice of violations, and enforcement actions are tracked and will be summarized in the annual report to NCDEQ for sites within the Town's jurisdiction. Information on site audits will also be included.

7.5 Post-Construction Stormwater Management

The Town's post-construction stormwater program includes four primary components: new development review, new SCM inspection, SCM audit program, and education and outreach.

Regulatory Mechanism

The Town of Hillsborough combined its zoning and development ordinances and adopted its Unified Development Ordinance (UDO) on February 28, 2011. *Section 6.20* of the UDO includes post-construction stormwater requirements (a copy *Section 6.20* is included in Appendix D). Post-construction requirements were updated in the UDO on December 10, 2012 to reflect additional standards required to meet the state's Falls Lake Nutrient Management Strategy (15A NCAC 02B .0277).

Post-Construction Stormwater Requirements

The Town of Hillsborough utilizes both structural and non-structural SCMs to treat and control post-construction stormwater runoff. Non-structural SCMs include stream buffers, flood hazard zone protection, landscape requirements, and educational materials as described in Section 7.1.

Structural SCMs include those listed in the NCDEQ *Stormwater Design Manual*. Design follows the state's Minimum Design Criteria (MDC) which have been codified in 15A NCAC 02H .1050 – .1062. Through its UDO, the Town requires structural SCMs to have recorded restrictive covenants, signed operation and

maintenance agreements, and certification by a licensed engineer that the SCMs have been properly constructed. These measures are in place to ensure proper operation of the SCM.

Pursuant to *Section 6.20* of the Town of Hillsborough's UDO and the State of North Carolina's Falls Lake Rules (15A NCAC 2B .0277), stormwater standards apply to all development and re-development projects that:

- Add 10,000 square feet or more of impervious surface;
- Disturb 10,000 square feet or more of land for purpose of development;
- Disturb ½ acre or more for a single-lot residential projects (not part of a larger project or common plan of development);
- Disturb ½ acre or more for recreational facilities on a single lot.

A current copy of *Section 6.20* of the Town's UDO is included in Appendix D of this document.

Other Related Policies, Practices, Regulations

In addition to the specific post-construction stormwater requirements listed in the *Section 6.20* of the Town's UDO, the Town of Hillsborough employs other policies, practices and regulations that help protect water quality of its receiving waters. Measures currently in place help to protect natural resources, protect open space, preserve trees, regulate redevelopment and street design. Through current policies the Town addresses green infrastructure elements and practices including low impact development and improved site design. A detailed list and description of these measures is included in Appendix E.

Measurable Goals

- New Development Review

  Review and approve proposed new development projects to ensure compliance with the Town's stormwater post-construction requirements. This includes addressing nutrient loading required pursuant to the Falls Lake Rules.

- New SCM Inspection

  Inspect new SCMs at the time the project is complete to ensure compliance with approved plans. Ensure that all easement documents, operation and maintenance documents, as-built surveys, and certifications have been completed and recorded as required. Map new SCMs using GPS/GIS technology and update the Town's SCM database accordingly.

- SCM Audits

  The Town requires that each privately owned SCM is inspected and maintained annually. Annual maintenance inspection reports are required to

be submitted to the Town by September 1 of each year. Stormwater staff reviews required annual inspection reports submitted by the SCM owner and conducts onsite "audits" of SCMs. Stormwater staff audits approximately one-third of all privately owned SCMs annually. When warranted follow up reports are submitted and if necessary, notices of violations are issued.

To provide incentive for maintenance of privately owned SCMs, stormwater staff initiated a recognition program in 2018. Property owners that consistently maintain their SCMs and have exceptional compliance records are eligible for the recognition. This program coincides with the onsite audits conducted by stormwater staff.

- Education/Outreach

  This portion of the post-construction stormwater management program is part of the overall education/outreach component described in *Section 7.1* and *7.2* of this document. Primarily this includes providing information to businesses, homeowner associations and other stormwater SCM owners about maintenance and inspection requirements.

Evaluation

The Town of Hillsborough maintains an electronic database used to track approved stormwater management plans, SCM audits, and other pertinent information for its post-construction stormwater program. SCMs are also mapped and data maintained in a GIS database. This information is included in the annual report to NCDEQ. Additionally, the Town submits similar information to NCDEQ as part of its Falls Lake Rules annual report.

7.6 Operation and Maintenance for Stormwater Pollution Prevention

The Town's Phase II Stormwater permit requires the development and implementation of a Pollution Prevention and Good Housekeeping program. Initially Town stormwater staff developed a *Pollution Prevention/Good Housekeeping Plan* for town-owned facilities. In 2020, staff completed a self-audit and determined that the good housekeeping plan needed updated and brought in other components that include SCM and MS4 operation and maintenance. The Town now implements the *Operation and Maintenance Plan for Stormwater Pollution Prevention* (OMP).

Using a multi-faceted approach, the OMP outlines procedures within daily operations as well as actions that provide oversight and enhancement opportunities. As part of the plan, pollution prevention practices are incorporated into regular maintenance activities at each facility. The plan also includes targeted pollution prevention practices like street sweeping, storm drain cleaning, and litter removal. The inspection and training components of the OMP will ensure compliance with all requirements and practices, identify new pollution prevention opportunities, and confirm that all staff understand their responsibilities under the

plan. The plan also lists measurable goals how it is evaluated. A copy of the plan is included in Appendix C.

ANNUAL REPORTING

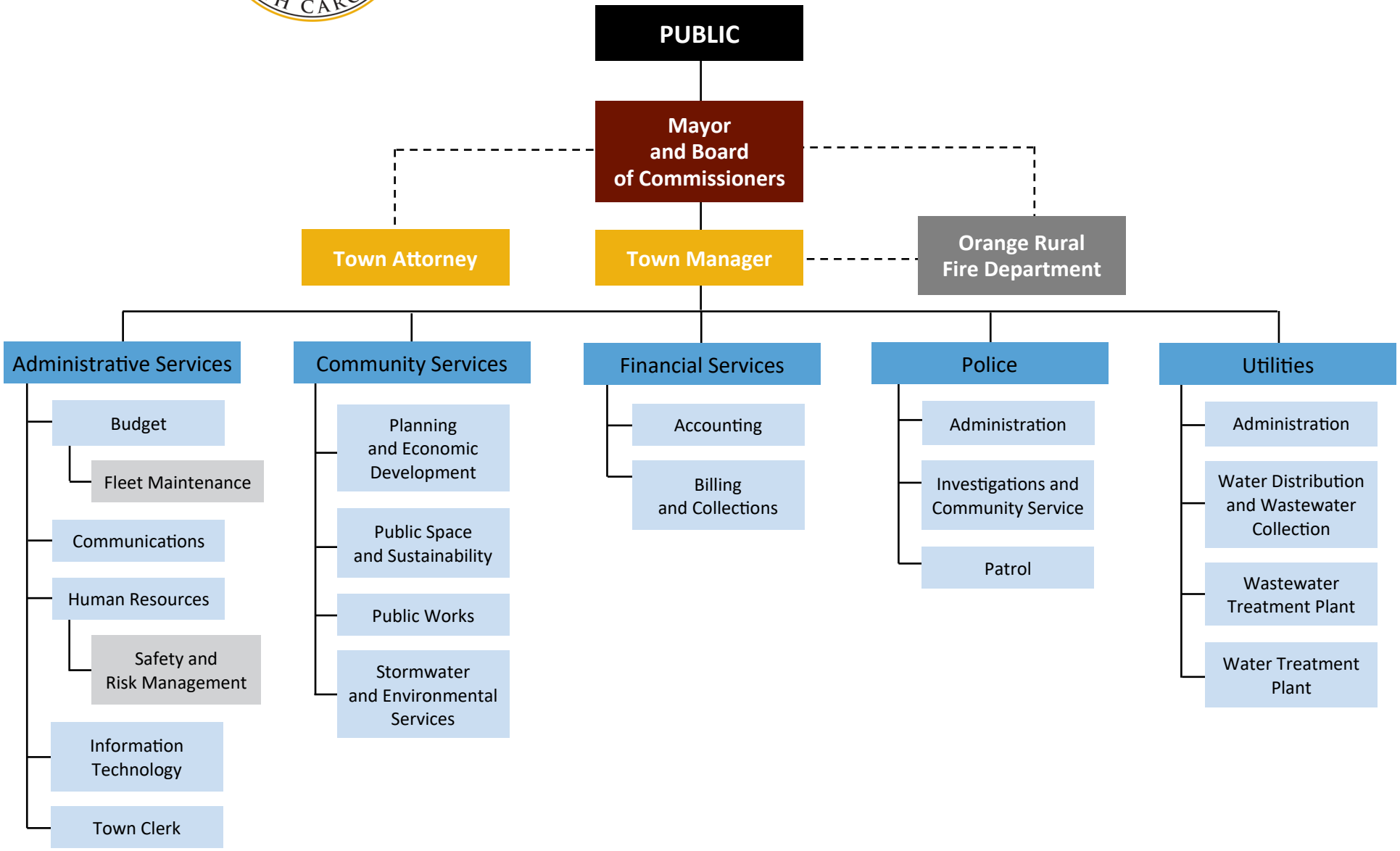
In order to help evaluate the effectiveness of the Town's NPDES Phase II stormwater program, NCDEQ requires the submittal of an annual report. The annual report submitted to NCDEQ is an online report that quantifies program elements completed in the previous permit year. Additionally, stormwater staff prepares a narrative annual report containing the same information as submitted online, but is made available to Town staff, elected officials and citizens.

APPENDICES

Appendix A

Town of Hillsborough Organization Chart

ORGANIZATIONAL CHART



Appendix B

Illicit Discharge Detection and Elimination Plan

Town of Hillsborough

NPDES Phase II
Stormwater Management Program

Illicit Discharge
Detection and Elimination Plan

March 2018

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Introduction

The Town of Hillsborough's (Town) National Pollutant Discharge Elimination System (NPDES) Phase II Stormwater permit requires the Town to develop and implement an illicit discharge detection and elimination program (IDDE). Illicit discharges include unauthorized connections to the Town's municipal separate storm sewer system (MS4) as well as illegal dumping of prohibited substances into the MS4. This plan outlines the Town's IDDE program, which consists of the following components:

1. Develop a storm sewer system base map;
2. Establish and maintain appropriate legal authority;
3. Implement illicit discharge detection procedures;
4. Conduct employee cross-training;
5. Provide public education and establish a reporting mechanism.

Goal

The goal of this plan is to develop and implement procedures that will locate and ultimately eliminate illegal connections and dumping into the MS4. By eliminating these discharges and connections, both public health and the health of the receiving water ecosystem will be protected.

1. Stormwater System Mapping

The first step in conducting a successful IDDE program is to identify where illicit discharges and connections may occur. To do this, it is important to know where the various components of the MS4 exist.

The Town's stormwater system includes curb inlets, yard inlets, storm drains, catch basins, pipes, open channels, ditches, swales, as well as other man-made and natural stormwater runoff conveyances. These facilities, including outfalls, were mapped using Global Positioning System (GPS) technology and imported into a Geographic Information System (GIS).

As new outfalls and stormwater facilities are constructed, they will be mapped using GPS technology and updated into the GIS system, or their location will be provided by the developer for inclusion into the GIS system. During screening inspections, Stormwater staff will review how locations are defined and, if necessary, refine the data for clarity and consistency.

2. High Priority Locations

High priority locations for inspections and screening are identified where illicit discharges or connections are likely to occur. Many factors are considered in the prioritization. Commercial and industrial land uses are more likely to have discharges that contain harsh pollutants. On the other hand, due to the Town's age, some residential areas may contain illicit connections, such as washing machine discharges, or aging infrastructure (septic systems, sanitary sewers, etc.). Illicit discharges are also more likely to occur in highly developed areas or at locations where many stormwater discharges are concentrated in a small area. Citizen complaints and dry weather water quality data, if available, can help identify hot spots as well.

Considering these factors, stormwater outfalls are ranked based on the likelihood that illicit discharges would occur at or near these locations. Outfalls represent an effective screening location because conditions at the outfall can represent multiple locations upstream. Observations may include odor, color, or staining. Section 4.2(2) provides more detail on procedures for screening inspections.

A ranking system was developed to prioritize outfalls for annual screenings. Indicators were selected to score the outfalls based on available data and staff knowledge of development age, density, and other known conditions. The five indicators were:

- **Location within Focus Area**

  Focus areas were delineated where illicit discharges are most likely to occur. These areas represent a variety of risk factors, including dense commercial uses, aging infrastructure, older residential areas, and multiple outfalls within close proximity. Figure 1 shows the location and extent of the focus areas. Table 1 provides a description of each area.

Table 1. Focus Areas for Outfall Screening Inspections

Name	Abbreviation	Description
Central Business District	CBD	Dense commercial areas north of I-85 and extending to Orange Grove Road to the west and Downtown to the north.
Downtown	DT	The core downtown area, containing commercial and industrial development as well as some residential.

Name	Abbreviation	Description
Meadowlands	Meadowlands	A large, relatively dense industrial and commercial complex with a mix of new and old development.
West Hillsborough	WestH	Historic mill area with recent redevelopment and increasing commercial activity.

- **Proximity to Federally Permitted Facilities**

  Locations of federally permitted facilities were obtained from the U.S. Environmental Protection Agency 2015 Envirofacts Geospatial data (Figure 2). These facilities require permits for a variety of federal requirements, and some requirements might not be directly related to water discharges. However, the purpose of this indicator is to prioritize outfalls where various pollutants are more prevalent and have a higher frequency of use. These locations also provide an indicator of industrial activities. Outfalls are prioritized if they are located within 1000 feet of a federally permitted facility.

- **Proximity to General and Light Industrial Zoning**

  The Town of Hillsborough regulates two industrial zoning districts: General Zoning and Light Industrial Zoning (Figure 2). While the federally permitted facilities also address industrial uses, the two data layers do not completely overlap. This indicator provides assurance that outfalls near industrial activities will be inspected frequently. Outfalls are prioritized if they were located inside or within 1000 feet of these zoning districts.

- **Septic Tank Concerns**

  Based on a list of permitted septic systems maintained by Orange County Environmental Health, about 30 to 40 septic systems are estimated to exist within or near the Town's municipal boundaries. While the remaining parcels are served by sanitary server, unpermitted septic systems might operate in isolated areas. Location relative to sanitary sewer mains can help identify where unpermitted systems might exist.

  This indicator will be used to prioritize outfalls where septic system concerns exist. For the initial prioritization, five outfalls were identified as being near residential lots that have a greater likelihood of operating unpermitted septic systems (distant from sanitary sewer main). After these concerns are investigated, outfalls near permitted septic systems can be prioritized. Each year,

the prioritized outfalls will be evaluated and adjusted based on the best available information on septic system concerns within Town limits.

- **Recent Inspections**

  Illicit discharges could occur at any outfall, even in the lower priority areas. Outfalls that have not been inspected in the past two years will be prioritized to ensure that some lower priority areas are inspected each year.

Using the above indicators, the outfalls are scored from 1 to 10, with 10 indicating the highest priority for screening. For the focus areas, the outfalls are scored differently by focus area (see Table 2). An outfall must be within the focus area boundary to receive the priority score. For all other indicators, if an outfall met the priority criterion, then it received a score of 10 for that indicator. If not, the outfall received a score of 2.5. The scores are averaged for each outfall, and the outfalls are ranked based on the average score. Based on these scores, the top 3 percent of the outfalls will be selected every year for screening inspections. The inspection process is described in Section 4.2(2).

Table 2. Focus Areas Scoring

Focus Area	Score
Central Business District	10
Downtown	10
Meadowlands	7.5
West Hillsborough	7.5
None	2.5

The outfall ranking will be updated on an annual basis prior to dry weather screening inspections. The septic system and recent inspections indicators will be updated annually, and the other indicators will be adjusted as necessary or when updated data are available.

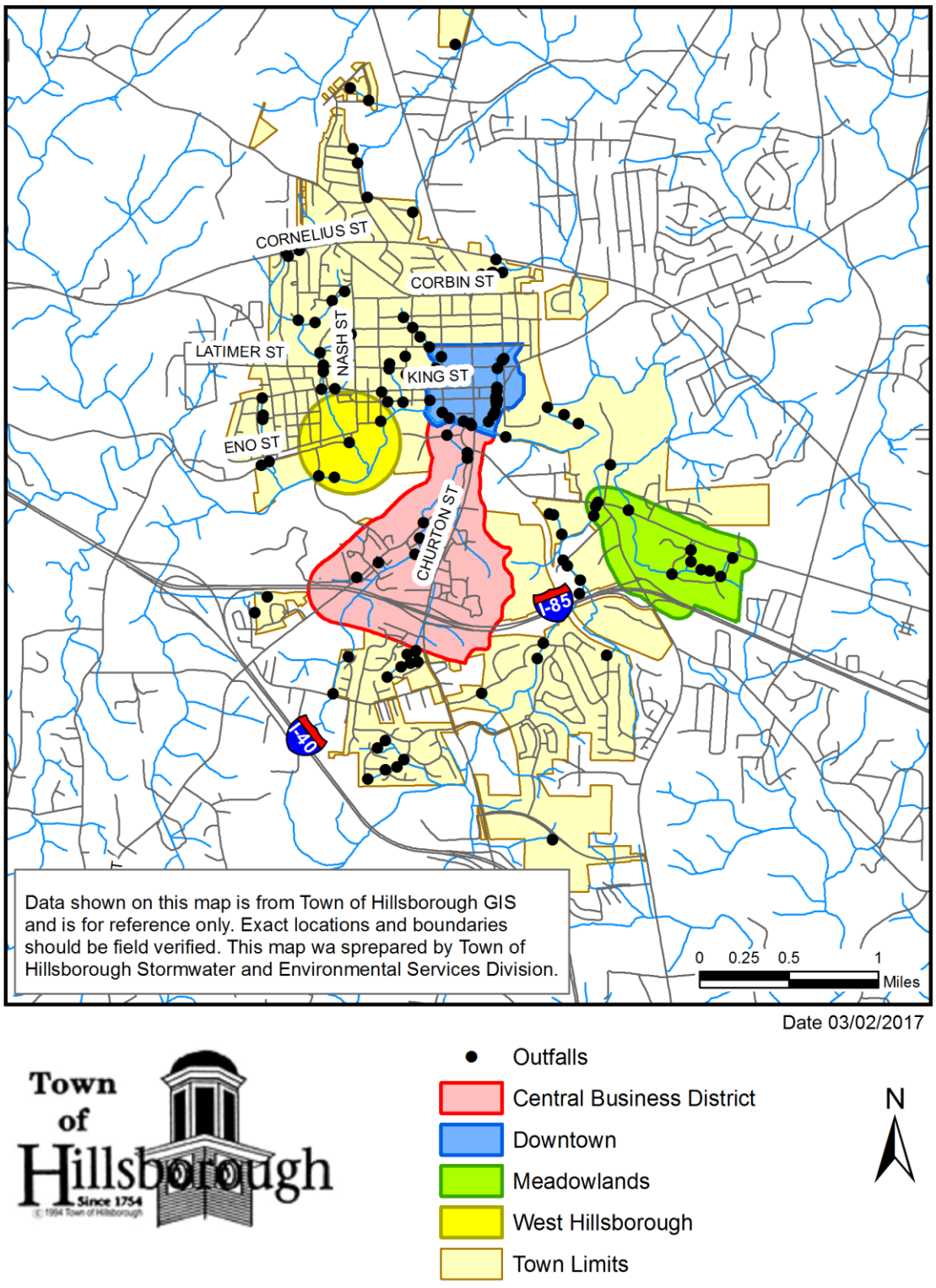

Figure 1. Outfall Screening Focus Areas

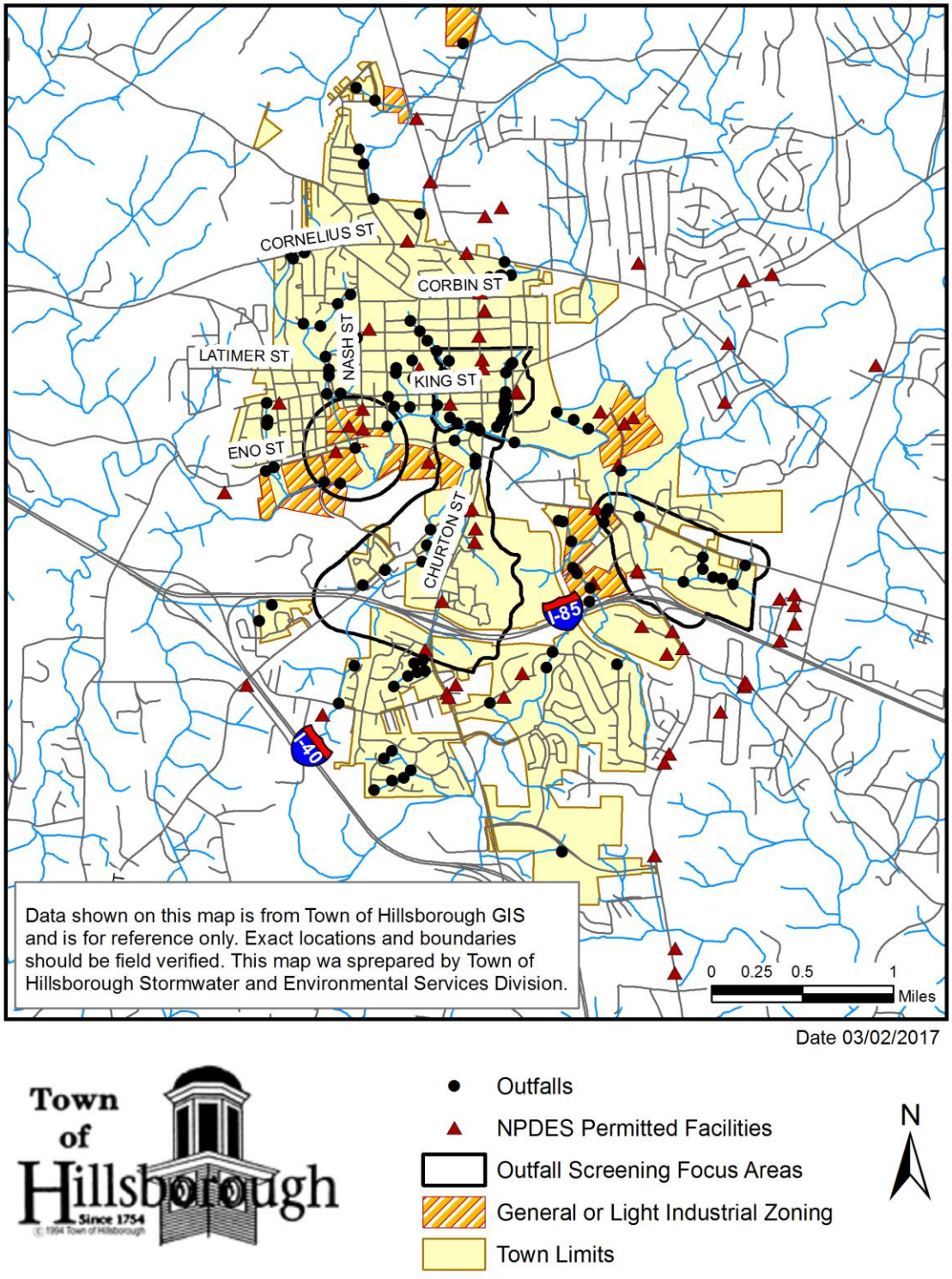

Figure 2. Geographic indicators used for Outfall Ranking

3. Legal Mechanism

Prohibition of illicit discharges and connections are regulated through Chapter 11, Article V Control of Illicit Discharges into the Stormwater System of the Town of Hillsborough's Municipal Code (Town Code).

4. Illicit Discharge Detection Procedures

The Town of Hillsborough employs two full time staff: a stormwater program manager and a stormwater coordinator. Additional Town employees are cross-trained to identify possible illicit discharges and connections as part of their other routine duties.

4.1 Responsible Staff

The Town's stormwater coordinator is responsible for implementation of this IDDE plan. The stormwater coordinator will maintain the GIS data and outfall ranking as well as conduct annual screening inspections and following up on citizen complaints. The stormwater coordinator will work with the stormwater program manager to ensure that other town employees are provided training in illicit discharge detection. While the goal will be having all town employees trained, the following departments will be targeted.

Public Works

Since the stormwater program operates as part of the Public Works Development, Public Works employees can be trained to identify and look for illicit discharges. Staff is often inspecting and making repairs to street right-of-way owned by the Town, which may include portions of the stormwater system.

Utility Department

The Town's Utility Department also employs field personnel that can assist in identifying illicit discharges. Utility Department personnel are responsible for maintaining water and sanitary sewer systems and easements. This includes investigating and correcting sanitary sewer overflows.

Fire Marshal Office

The Town's Fire Marshal is responsible for enforcement of the Town's hazardous waste regulations, which is part of the fire prevention ordinance. This includes investigating spills and discharges of hazardous materials. The Fire Marshal's office also inspects local business, residences, and institutions for compliance with applicable code. During these inspections, illegal discharges can be noted if found.

Police Department

Some illicit discharges may occur outside of normal operating hours. The Town's police officers patrol the town on a 24-hour basis and could detect illegal discharges during their regular patrols.

4.2 Inspection Procedures

There are six primary responsibilities when staff conduct illicit discharge inspections. These include:

1. Dry weather flows;
2. Stormwater system maintenance;
3. Citizen requests/complaints;
4. Illicit discharge source;
5. Sanitary sewer system maintenance & inspection;
6. Hazardous spill/discharge response.

Procedures relating to illicit discharge inspections for each of these tasks or indicators are described in the following sections

(1) Dry Weather Flows

Dry weather flows mean that there is actually flow from an outfall but it has not been raining. During performance of routine duties, Public Works, Utilities and other trained staff will look for dry weather flows from storm sewer pipes. If found, staff will document the location and the following physical indicators of the flow from the outfall:

- Odor;
- Color;
- Turbidity (i.e. cloudiness);
- Floatables (foam, trash, etc.).

If possible staff will photograph the flow, then contact the stormwater coordinator to conduct a follow up inspection.

If the follow up inspection determines that the dry weather flow is indeed an illegal discharge, a Notice of Violation (NOV) letter will be sent to the property owner by the stormwater coordinator. The NOV will provide a timeline to mitigate the discharge and if not complied with, the owner will be subject to civil penalties in accordance with Town Code. If necessary, the Town will take action to correct the problem at the owner's expense.

(2) Stormwater System Maintenance & Inspection

Two types of inspections are conducted on a routine basis: 1) inspections by Public Works staff during maintenance activities and 2) screening inspections by Stormwater staff.

Public Works Inspections

Public Works staff conduct routine maintenance of road right-of-ways owned by the Town. This includes portions of the stormwater system. As part of their routine maintenance, staff will look for indicators of illicit discharges and connections. These indicators include the following:

- Outfall damage;
- Deposits/stains;
- Poor pool quality;
- Non-stormwater pipes;
- Pipe benthic growth.

If illicit discharges or connections are suspected, staff will provide the location, description of the indicators found, and photographs if possible, to the stormwater coordinator. Staff will also follow procedures listed under item (1) above if dry weather flows are noted during maintenance activities.

Stormwater Screening Inspections

Stormwater program staff will review mapped stormwater outlets and using the criteria outlined in Section 2 above, conduct screening inspections of outfalls in high priority areas. The screening inspections will be conducted during summer months when at least 72 hours have elapsed since the most recent rainfall event. Staff will visit the outfall and record visual observations including the indicators listed above (dry weather flows and Public Works staff indicators).

(3) Citizen Requests/Complaints

Often, citizens will contact various departments with drainage issues, nuisance odors, erosion concerns, etc. Staff will investigate these requests or complaints and if it is stormwater related, provide a description and location to the stormwater coordinator to investigate. As listed above, should an illicit discharge or connection be discovered, an NOV letter will be sent to the property owner by the stormwater coordinator. Appropriate action will be taken by the Town to ensure the responsible party removes the illicit discharge or connection.

(4) Illicit Discharge Source

Should an illicit discharge or connection be identified through inspections, citizen complaints, or simply through performing routine duties, Public Works staff will assist the stormwater coordinator with tracing the problem to its source. Once the source is identified, the stormwater coordinator will notify the owner to remove the discharge. As necessary the Town will take action, including measures outlined in the appropriate sections of the Town Code, to ensure the illicit discharge is removed.

(5) Sanitary Sewer System Maintenance

The Town's Utility Department is responsible for the operation and maintenance of the sanitary sewer system. Sanitary sewer spills or overflows are a type of illicit discharge. Spills and overflows are also regulated by the State and requires additional procedures to be followed. In addition to the procedures required by the State, the Utility Department will notify the stormwater coordinator in the event of a reportable sewage spill from the sanitary sewer system and indicate the location of the spill, if it entered the storm sewer system, or reached a surface water.

The Utility Department will inform the stormwater coordinator when areas of significant erosion along sanitary sewer easements are found. Utility employees will stabilize areas as soon as practicable. Likewise, the Utility Department will notify the stormwater coordinator when maintenance work involves impact to a designated stream buffer. This will help to ensure that sediment, vehicle fluids or other substances do not reach receiving waters during maintenance of the system.

(6) Hazardous Spill Response

Regulations regarding hazardous materials are included within the Town Code. The Town's Fire Marshal Office enforces these regulations. A copy of the Town's hazardous material control regulations is included as Attachment B.

When a hazardous material spill or discharge occurs the Fire Marshal will notify the stormwater coordinator and describe the spill and whether it reached the MS4 or receiving water. This notification is in addition to required notifications outlined in Attachment B. The Fire Marshal will notify the appropriate state and federal entities, as applicable.

4.3 Stream Sampling

In a coordinated effort with Orange County, a two-year water quality sampling program was conducted. The sampling data indicated that water quality was

within acceptable standards. The sampling specifically looked at nutrient concentrations. Excess nutrients are one of the target pollutants and this information is being used to help develop nutrient reduction plans as required through the state's Falls Lake Rules.

As part of the Falls Lake Rules requirements, the Upper Neuse River Basin Association (UNRBA) conducts monitoring at two locations on the Eno River, one upstream and one downstream of the Town. The Town is a member of the UNRBA and the data collected will also be used to assist the Town and other UNRBA member governments to develop plans to reduce nutrients in the watershed.

The Town will continue to evaluate the need for additional stream sampling to facilitate identification of potential ongoing illegal discharges.

5. Employee Cross-Training

Recognizing illicit discharges and connections are an essential part of the IDDE Plan. Since the Town does not maintain full time staff dedicated to finding and removing illicit discharges, it is even more important that staff in multiple departments understand how to identify possible illicit discharges and connections. In order to successfully identify illicit discharges and connections, training opportunities will be provided for staff identified in Section 4 of this plan.

The stormwater coordinator will work with the stormwater program manager to conduct training for staff and/or identify other training opportunities that may exist through the state or in conjunction with other local governments. Information regarding IDDE training opportunities will be circulated to supervisors of these departments to determine which staff should attend. On an on-going basis, additional staff members who would benefit from the cross-training will be identified and trained.

6. Public Education and Reporting

Information regarding the IDDE plan will be included as part of the overall stormwater education and outreach program. An informational fact sheet has been developed and is distributed both to citizens and businesses. The fact sheet explains what constitutes an illicit discharge and connection. It contains a phone number and other contact information for the public to report suspected illegal stormwater discharges.

7. Implementation

It is important to note that this is a working plan. The Plan will be updated periodically and details will be added as they are developed. Changes to this Plan that affect the Town's Comprehensive Stormwater Management Plan (CSWMP) will be noted in the CSWMP. Implementation of the IDDE program is set pursuant to the Town's NPDES Phase II permit.

8. Evaluation

To maintain an effective working plan periodic evaluation of its effectiveness is key. As this plan is implemented various components will be qualitatively evaluated to determine effectiveness. Quantitative measures will also be evaluated as they become available. Some areas and means to evaluate this program include, but are not limited to:

- Number of citizen complaints
- Repeat incidents
- Number and frequency of inspections
- Response time between request and inspection
- Number of staff trained in IDDE (including cross-training of staff)
- Number of spills and amounts
- Number of NOVs issued
- Stream sampling results
- Outreach activities (flyers, events, brochures)
- Proactive detection/elimination versus reactive/complaint based
- Proactive maintenance of stormwater and sanitary sewer
- Review of industrial and commercial facilities

This information will be logged and maintained by stormwater staff. At least annually, this information will be utilized to improve the effectiveness of the program, included in the annual report, and where appropriate used to assist with permit renewal.

Appendix C

Operation and Maintenance Plan for Stormwater Pollution Prevention

Town of Hillsborough

NPDES Phase II
Stormwater Management Program

Operation and Maintenance Plan for Stormwater Pollution Prevention

April 2021

TABLE OF CONTENTS

INTRODUCTION

The Town of Hillsborough's (Town) National Pollutant Discharge Elimination System (NPDES) Phase II Stormwater permit requires the development and implementation of a Pollution Prevention and Good Housekeeping program. In response, the Town's Stormwater and Environmental Services Division developed the Hillsborough Pollution Prevention Program. The program focuses efforts at town facilities and implements procedures that prevent or minimize pollution in stormwater runoff. The Operation and Maintenance Plan for Stormwater Pollution Prevention (OMP) describes the program and outlines procedures to prevent stormwater pollution at Town facilities.

Using a multi-faceted approach, the OMP outlines procedures within daily operations as well as actions that provide oversight and enhancement opportunities. As part of the plan, pollution prevention practices will be incorporated into regular maintenance activities at each facility. The plan also includes targeted pollution prevention practices like street sweeping, storm drain cleaning, and litter removal. The inspection and training components of the OMP will ensure compliance with all requirements and practices, identify new pollution prevention opportunities, and confirm that all staff understand their responsibilities under the plan.

The main components of the OMP are:

- Inventory of Town Owned/Operated Facilities
- Inspections
- Routine Maintenance
- Spill Response Procedures
- Pesticide, Herbicide and Fertilizer Application Management
- Training
- Vehicle and Equipment Cleaning
- Implementation
- Future Updates

The goal of the OMP is to implement a sustainable and adaptable stormwater pollution prevention program that will minimize stormwater runoff pollution from Town operations and facilities.

1. Inventory of Town Owned/Operated Facilities

The OMP includes all town facilities that have the potential for generating stormwater runoff pollution from town operations. The Town has developed an inventory of these facilities and maintains spatial data on the location, type, and condition of each. The following sections provide details on these facilities, including how certain facilities are prioritized.

1.1 Properties

Figure 1 shows town property included in this plan as well as the full extent of town owned property. Properties under the OMP include those that contain a developed land use and where permanent town operations have been established. The Town owns additional properties that are either undeveloped or operating under a temporary or transitional use. Once vacant properties are developed, or permanent uses established, these facilities will be added to the plan during plan updates.

The Town also maintains public road rights-of-way (ROW) within town limits. These do not include roadways that are owned and maintained by the North Carolina Department of Transportation (NCDOT). Town owned public road ROWs are addressed in more detail in Section 1.3. Locations of town-owned properties, SCMs, and stormwater infrastructure are maintained in an ArcGIS database.

Priority Facilities

Within the OMP properties, priority facilities have been identified that present the greatest need for pollution prevention implementation and oversight. Facilities selected for this list met at least one of the following criteria:

- A stormwater control measure (SCM) exists on-site.
- The facility presents a relatively high risk of stormwater pollution sources.

SCMs have frequent maintenance needs that directly relate to their function in removing pollutants from stormwater runoff. Other town facilities, particularly those with industrial uses, present a high risk for pollutant sources from daily operations. Table 1 indicates which facilities have been identified as priorities, including the reason for this designation. These priority facilities require more frequent inspections as outlined in more detail in Section 2.1.

Priority Facilities with SWPPPs

Several of the priority facilities identified above are considered to have a higher risk due to the nature of the operations. These facilities operate under a stormwater pollution prevention plan (SWPP) developed specifically for the facility. Section 2.1 explains the additional inspection requirements for these facilities.

1.2 SCMs

As indicated under Priority Facilities, several town properties include SCMs that control and treat stormwater runoff. When additional SCMs are constructed on town property, these SCMs will be added to the OMP during plan updates. Figure 1 shows the location and type of SCMs owned by the Town.

1.3 MS4

The Town maintains public road ROW in portions of their jurisdiction that are not owned and maintained by NCDOT. The stormwater conveyances within this ROW are considered the Town's municipal separate storm sewer system (MS4). These

stormwater conveyances include swales, ditches, pipes, catch basins, and other stormwater infrastructure. Figure 2 shows the location and type of town MS4 facilities.

Table 1. Town of Hillsborough OMP Properties and Priority Facilities

Facility	SWPPP	SCM	Priority for Inspection*	Reason for Designating Priority
Community Policing Center				
Cemetery				
Cates Creek Park		✓	✓	SCM present
Gold Park		✓	✓	SCM present
Fleet Maintenance	✓		✓	SWPPP
Murray Street Park				
Orange County Museum				
Police Department				
Public Parking Lot			✓	Potential for IDDE
Public Works	✓		✓	SWPPP
Riverwalk Greenway		✓	✓	SCM present
Town Hall Campus (including Annex)				
Former Town Hall Annex				
Turnip Patch Park				
Water Treatment Plant	✓		✓	SWPPP
Wastewater Treatment Plant	✓		✓	SWPPP
Water Distribution	✓		✓	SWPPP
Waterstone Water Tower		✓	✓	SCM present

*Priority facilities are inspected at least once annually.

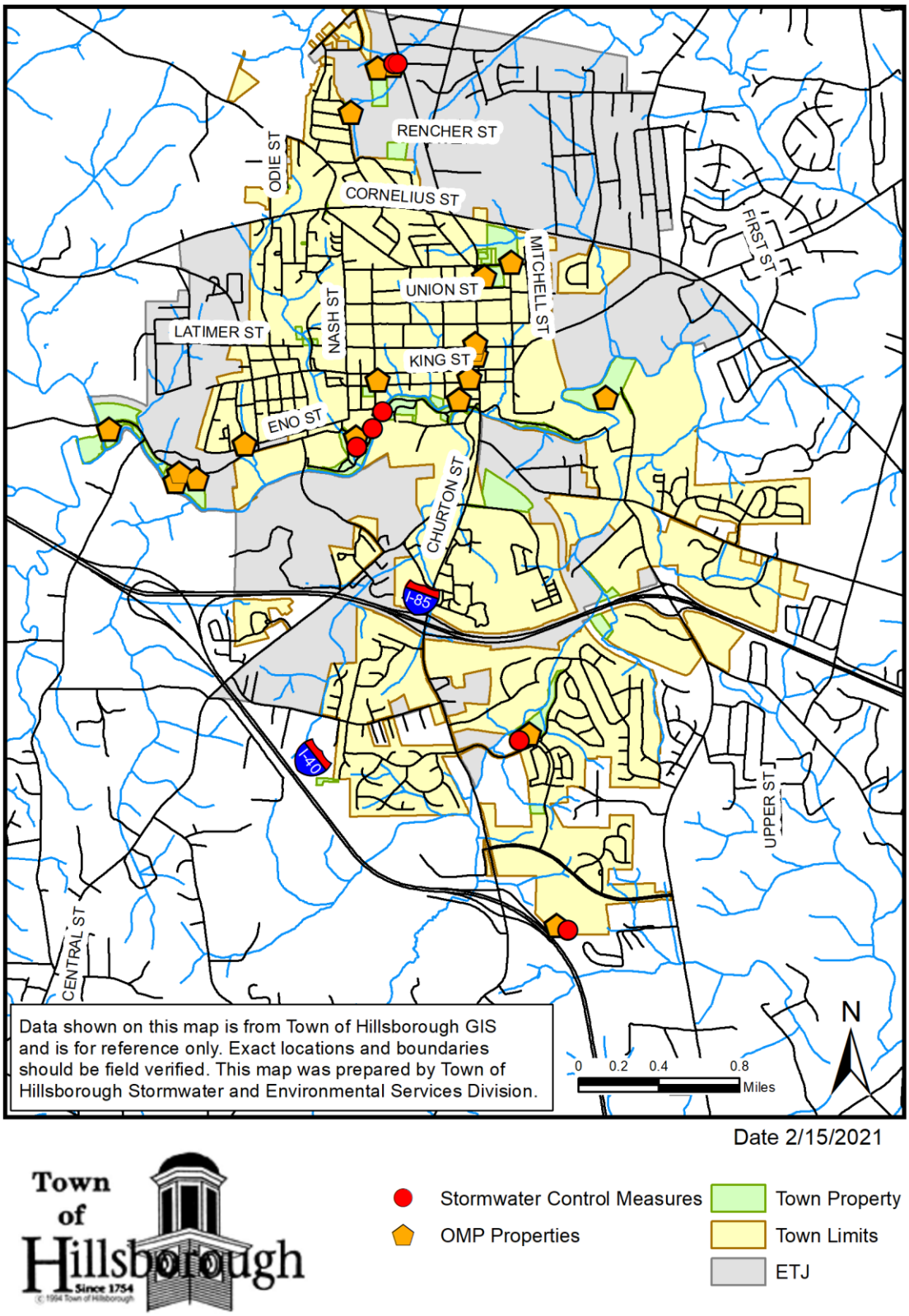

Figure 1. Town of Hillsborough Properties and Stormwater Control Measures

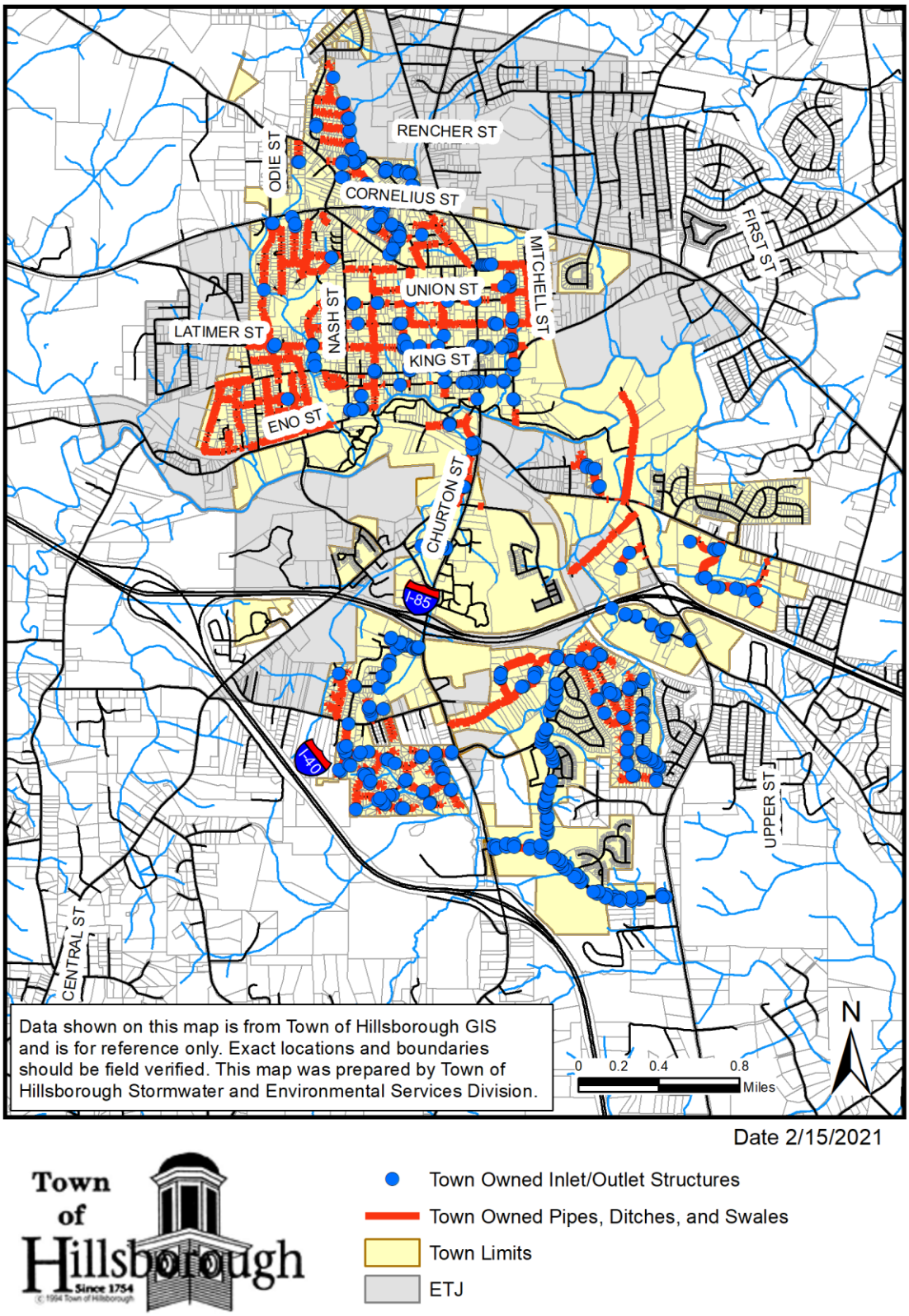

Figure 2. Town of Hillsborough Municipal Separate Stormwater Sewer System

2. Inspection Program

The inspection program specifies the inspection procedures for all town facilities addressed by the OMP. These procedures are tailored to each type of facility and priority level. During plan updates, procedures will be periodically reviewed to ensure that they are appropriate for each facility.

2.1 Property Inspection

The OMP inspection program includes regular inspections of town properties. These inspections include annual compliance inspections conducted by stormwater staff, self-inspections conducted by facility staff and operation review. Each type of inspection is described in detail in the following sections.

Annual Compliance Inspections

Town properties under the OMP will be inspected for compliance with pollution prevention practices. The stormwater program manager or designee will conduct the annual inspections. Each facility will be evaluated in the following categories as applicable: facility maintenance, stormwater system, materials/chemical storage and handling, vehicle/equipment management and the presence of illegal dumping or illicit discharges. Detailed inspection items will be described under these categories in an inspection field form template. Each item will be inspected to determine compliance and will be assigned one of the following:

Compliant – The item meets proper practices for pollution prevention.

Compliant with Conditions – The item generally meets pollution prevention practices but there are minor issues that need corrected or a certain practice simply needs to be improved.

Not Applicable – This facility does not contain this item; i.e. no chemical storage or vehicle maintenance, etc.

Non-Compliant – This indicates that practices are inadequate, not implemented and that there is pollution entering the stormwater management system or the potential for pollution is high.

The inspection report will include action items if applicable and a date to complete them. Non-compliant items will have short time frames based on risk. Follow-up inspections will be conducted to ensure action items are complete.

Inspection data will be maintained in an electronic database. Copies of inspection reports will be emailed to the facility manager/supervisor and their supervisor. Section 3.1 describes routine maintenance expectations and pollution prevention practices in more detail.

Priority facilities, as identified in Section 1.1, will be inspected annually. Non-priority facilities will be inspected every five years at a minimum (at least once during the permit cycle).

SWPPP Self-Inspections

Some facilities are considered higher risk due to the nature of the operations. These facilities will operate under a stormwater pollution prevention plan (SWPPP) developed specifically for the facility. In general, these plans require quarterly monitoring/inspection by staff that work at the given facility. Site-specific inspection frequency and staff responsibilities are outlined in the individual SWPPPs.

SWPPP Operation Review

The stormwater program manager or designee will review facility specific stormwater pollution prevention plans with facility staff at least once during the permit cycle. The review will determine if practices need to be altered, improved, eliminated or added. Input will be given on whether capital improvements are needed to help ensure pollution prevention so that funding can be budgeted.

2.2 Annual SCM Inspections

The Town of Hillsborough Unified Development Ordinance (UDO) requires all SCMs be inspected annually by an inspector certified under the NC State University SCM Inspection Certification Program (UDO Section 6.20.8.2). All SCMs owned by the Town or otherwise maintained by the Town will be inspected annually per the UDO requirements.

The stormwater program manager or designee will conduct the inspections and maintain an active inspection certification. Inspections will address key SCM elements and conditions, including vegetation, erosion, trash and debris, and wildlife activity. All structures will be inspected for repair needs. The inspection will also include screening for illicit discharge indicators and visible impacts to the receiving water.

Following the inspection, the SCM will receive one of the following designations:

Passed Inspection – The SCM is well-maintained, functioning as designed, and all previous action items have been addressed.

Needs Maintenance – The SCM is functioning as designed; however, one or more minor maintenance needs were identified during the inspection.

Failed Inspection – The SCM is not functioning as designed and significant maintenance and/or repairs are needed to restore function.

For SCMs designated as “Needs Maintenance” or “Failed Inspection,” the inspection report will include action items and a date to complete them. Follow-up inspections will be conducted to ensure action items are complete.

Inspection data will be maintained in an electronic database. Copies of inspection reports will be emailed to the facility manager/supervisor and their supervisor.

2.3 MS4 Inspections

The Town has a responsibility to maintain its stormwater infrastructure to ensure public safety and meet permit requirements. In general, the Public Works Division is responsible for inspecting and maintaining the town's MS4 facilities. However, the Eno River is the ultimate receiving waterbody for the MS4. The river is valued as a natural resource and destination for a variety of public recreational activities. As a result, the MS4 inspections program represents an interdepartmental effort to deliver town services, meet permit requirements, and protect the Eno River. Under the OMP, Public Works staff will inspect MS4 facilities to identify maintenance needs and to minimize pollutant delivery to downstream waterbodies. Stormwater and Environmental Services staff will provide additional technical support in these inspections, including assistance with data management and mapping. Assessments and inspections will be conducted as outlined below.

MS4 Neighborhood Assessment

The Town has developed a MS4 assessment protocol to be conducted regularly and integrated within the Public Works Department maintenance activities. The inspections will be organized by neighborhood and involve a whole-neighborhood field assessment of stormwater infrastructure. Neighborhoods are defined as both residential and commercial areas that include town-owned streets and associated town MS4 infrastructure.

During the field assessment, staff will evaluate the condition of structures and rank them according to the degree of function and repair needs. Structures to be evaluated include shoulders, ditches, cross-pipes, catch basins, drop inlets, shoulder drains and any other stormwater conveyance structures within the town owned public ROW.

Following the inspections, the ratings will be compiled and reported in a neighborhood map. The Public Works Manager, or designee, will determine workflows based on the compiled ratings. When all workflows are completed, Public Works and Stormwater staff will review the repaired street segments for completeness.

The following ratings will be used in the neighborhood assessment:

- A – Equal to or greater than 75% of the element meets condition indicator.
- B – 50% to < 75% of the element meets condition indicator.
- C – Less than 50% of the element meets condition indicator.

Each structure will have a separate condition indicator to guide the rating. In general, work will be prioritized for street segments receiving a C rating for at least one structure within the segment. However, Public Works may determine additional work needs in other rated segments while performing the work.

Each neighborhood assessment will be designed to take two years. In the first year, the assessment will be conducted, which may include public participation and review. Once the assessment is completed, maintenance costs will be identified and budgeted for the following fiscal year. In the following year, workflows will be assigned and targeted for completion by Public Works staff or contractor as appropriate. Public Works staff will track completed maintenance including the linear feet of ditches/swales maintained and the amount of debris and sediment removed from the MS4. Neighborhood selection for each assessment will be based on a variety of factors, including prior citizen complaints, known repair needs, age of infrastructure and proximity to downstream waterbodies.

The Town developed this protocol using the Cornwallis Hills neighborhood as a test. Assessments and maintenance identified through this process have been completed for this neighborhood. Stormwater and Environmental Services staff is in the process of converting this to a completely electronic, GIS based system. This system is expected to be complete by July 1, 2021, and a schedule for neighborhood assessments has been developed based on this date. Table 2 provides a list of neighborhoods, town-owned streets within those neighborhoods and a planned schedule for completion. Note that this is a working schedule and is subject to change based on available resources and personnel. This schedule will be updated annually at the beginning of the fiscal year.

Supplemental MS4 Inspections

In addition to the MS4 neighborhood assessment, the OMP includes three supplemental inspection strategies for identifying MS4 maintenance needs:

- The Department of Public Works will conduct inspections of stormwater infrastructure within the town MS4 as part of their other routine duties. During these inspections, additional cleanout and repair needs will be identified.
- Citizens periodically contact the Town to report drainage concerns. When these concerns are assessed in the field by Public Works staff, any cleanout or repair needs will be identified and addressed.
- Dry weather inspections of stormwater outfalls, as outlined in the Illicit Discharge Detection and Elimination (IDDE) Plan, provide an additional MS4 inspection opportunity. During these outfall inspections, stormwater staff will report any MS4 clean out or repair needs to Public Works.

Combined with the MS4 neighborhood assessment, these efforts are designed to provide a comprehensive oversight of the MS4 system and to ensure that all priority maintenance needs are identified and promptly addressed.

Table 2. Town of Hillsborough OMP Neighborhoods and Assessment Schedule

Neighborhood Name	Type	Planned	Completed	Notes	Town Streets
Cornwallis Hills	Residential	FY17	FY19	This was the "test" neighborhood; will be first in next cycle	Brick Hearth Dr, County Seat Dr, Hardwood Dr, Hooper Ct, Lafayette Dr, Myrtle Ln, Nutbush Ct, Patriot Pl, Pointe Pl, Smallwood Ct, Sweet Gum Dr, Town Crier Ct, Twisted Ct, Uphill Ct
Cornerstone	Commercial	FY21			Cornerstone Ct, Valley Forge Road
Beckett's Ridge	Residential	FY22			Baycourt Trail, Beckett's Ridge Dr, Chandler Ct, Ingram Ct, Kennesaw Ct, Oakhurst Trail, Savannah Ct, Scotsburg Trail, Willowbrook Trail, Woodbury Dr
Granview	Residential	FY22			High Court, Summit Dr
Kenion Grove	Residential	FY23			Childsberg Way, Constitution Way, Regulators Way
Historic District	Mixed Use	FY23-24		Will split this assessment into "east" and "west"	Caine St, Calvin St, Cameron St, Cedar Grove Rd, Cedar St, Corbin St, Court St, Exchange Park Lane, Faribault Ln, Hassel St, Hillsborough Ave, Lydia Lane, Maplewood Dr, Margaret Ln, McAdams Rd, Mitchell St, Oak St, Occoneechee St, Orange St, Queen St, Revere Rd, Tryon St, Turner St, Union St, Wake St, Warner Ln, Westdale Ct
West Hillsborough	Residential	FY25			Allen Ruffin Ave, Ashe St, Barracks Rd, Bellvue Ave, Benton St, Bonaparte Dr, Brownville Ave, Collins Ave, Durham St, Eno St, Foust St, Hayes St, Holt St, Jones Ave, Knight St, Murray St, Nash St, Piney Ln, Raynor St, Riley Ave,

Neighborhood Name	Type	Planned	Completed	Notes	Town Streets
					South St, Spring St, Spruce St, Sunset Circle, Waddell St, Webb St
Fairview	Residential	FY26			Cleo Ct, Dalton St, Daye St, Dixie Ave, Hill St, Homemont Ave, Lawndale Ave, Mollie Ct, Odie St, Rainey Ave, Riddle Ave, Torain St, Wildaro Ct
Hillsborough Heights	Residential	FY26			Alma Ave, Boundary St, Central Ave, Coley Circle, Combs Circle, Daphine Dr, East Dr, Forrest St, Freeland Dr, Lakeshore Dr, Sherwood Ln, Short St W, Terrell Rd
Flint Ridge	Mixed Use	FY27			Cates Ct, Cheshire Dr, Murdock Rd
Gatemore	Residential	FY27			Dana Ct, Jamie Ct, Rhonda Rd, Robert Ct, Sand Ct
Magnolia Place	Residential	FY27			Magnolia Ln, Pond Lily Ct
Hampton Pointe	Commercial	FY28			Hampton Pointe Blvd
Millstone Business Park	Commercial	FY29			Leah Dr, Millstone Dr
I-85/Churton Commercial	Commercial	FY29			Cardinal Dr, John Earl St, Mayo St, Old Dogwood St
Meadowlands	Commercial	FY30			Corporate Dr, Executive Ct, Meadowland Dr
Elizabeth Brady	Commercial	FY30			Elizabeth Brady Rd
Waterstone	Mixed Use	FY31		Relatively new curb and gutter development	Aurora Road, Botan Way, Cates Creek Parkway, College Park Road, Empress Road, Fairy Moss Lane, Papyrus Place, Waterstone Drive

Neighborhood Name	Type	Planned	Completed	Notes	Town Streets
Corbin Creek Woods	Residential	FY32		Relatively new curb and gutter development	Huddle St, Mitchell St
Corbinton Commons	Residential	FY32		Recently completed new development	Bridge St, Market House Way
Forest Ridge	Residential	FY32		New subdivision currently under construction	Boxwood Trace Lane, Clandon Square Road, Clarkson Ridge Lane, Ellsworth Manor Drive, Garden Heights Lane, Maple Glen Drive, Prestwood Drive, Quincy Cottage Road, Stanton Gable Lane, Talcondale Court
Collins Ridge	Residential	FY35		New subdivision currently under construction	Bluffberry Way, Brightleaf Road, Country Side St, Flat Ford Road, Gold Hill Way, Haven Hill, Open Air Lane, Orange Grove St, Picnic Place, Poet Pointe, Sea Trail St, Watermill Way

3. Routine Maintenance

The Town seeks to minimize stormwater pollution by including pollution prevention practices in routine maintenance at all facilities under the OMP. Routine maintenance is generally defined as the “day to day” practices town staff are expected to undertake as part of their routine duties to minimize stormwater runoff pollution.

The plan organizes routine maintenance activities into the following categories:

- All facilities
- Streets, Roads, and Public Parking Lots
- SCMs
- MS4

The following subsections outline the general approach to maintenance for each of these categories. Identification and completion of specific maintenance will be identified through the inspection process described in Section 2 of this document. Inspection workflows include follow up to ensure maintenance is completed.

3.1 All Facilities

The following activities will be considered routine maintenance procedures relevant to all town facilities:

- Areas subject to erosion will be stabilized with vegetation, mulch, or other appropriate sediment and erosion control;
- Loose trash and litter will be picked up and disposed of appropriately;
- Garbage containers will be properly maintained to prevent contact with stormwater;
- Spills/leaks will be cleaned and properly contained from stormwater contact;
- Parking lots/areas will be kept free of trash and litter; parking lots will be evaluated annually for inclusion in the town’s street sweeping program;
- On-site storm drains, catch basins, and other stormwater infrastructure will be maintained in working order; annual inspections outlined in Section 2 above will identify maintenance needs;
- Trash/litter will be removed from catch basins and other portions of the stormwater system;
- Leaves, grass clippings and other landscape waste will be kept out of the stormwater drainage system.

If materials and chemicals are stored at a facility, the following additional maintenance practices will apply:

- Spill kits and/or other appropriate containment will be located on-site;
- Materials/chemicals will be stored in original containers with original labels;
- Materials/chemicals will be isolated from contact with stormwater;
- Hazardous materials will be appropriately stored, labeled, inventoried, disposed of, handled, etc.

If vehicles are stored at a facility, the following additional maintenance practices apply:

- Fueling areas will be protected from precipitation and run-on and properly maintained;
- Wash water will be contained and kept out of storm sewer/drainage system;
- Maintenance activities will be performed indoors where practical;
- Vehicle/equipment fluids will be recycled and/or disposed of properly.

Appendix A provides a detailed list of pollution prevention and good housekeeping best management practices for town staff at all facilities.

3.2 Streets, Roads, and Public Parking Lots

The town's Public Works Division is responsible for maintaining town owned or operated streets, roads and parking lots. Three components of the Public Works street maintenance program are targeted to reduce stormwater runoff pollution from entering the towns MS4. Those components include:

- *Street sweeping* – currently the town contracts with a sweeping service. Sweeping focuses on curb and gutter streets. The town's Public Works Division is responsible for administering the program and contract. The program includes tracking the linear feet of streets swept and the amount of solids removed. This information is used to evaluate the effectiveness and is utilized to determine if streets need to be added or removed from the program. Public works maintains the tracked information electronically and works with Stormwater and Environmental Services Division staff to evaluate the program's effectiveness.
- *Leaf/Yard Debris collection* – the Public Works Division provides solid waste removal for town residents and that program includes leaf and yard debris pickup. Public Works uses a vacuum truck to remove leaves that are raked to the edge of town streets. Leaves are sent to a compost facility and are also made available to residents wishing to use them for compost. Leaf collection begins in October and ends in January of each calendar year. The amount of leaves removed is tracked by Public Works.

Yard debris, such as tree limbs and other woody debris is also removed by Public Works staff. Debris removal is offered weekly during the growing season. Public Works also removes suitably bagged grass clippings. The amount of debris removed is tracked. This program is essential to reduce excess nutrients from stormwater runoff.

- *Trash/Litter removal* – As part of their "day to day" routine duties Public Works staff remove trash and litter found along town-maintained streets. The amount of trash removed is tracked.

3.3 SCMs

The Town recognizes that regular maintenance is essential to achieve the full pollution reduction benefits from the SCMs. For all town-maintained SCMs, the Town will follow maintenance activities outlined in the Stormwater Design Manual and O&M EZ tool published on-line by the North Carolina Department of Environmental Quality (NCDEQ).

Responsibility for routine SCM maintenance will be delegated to staff who maintain the larger property where the SCM is located. Routine maintenance includes mowing, pruning, and mulching, etc. Other maintenance items may be completed by the Public Works Division or a contractor as necessary. Appendix B includes the SCM maintenance activity tables relevant to town owned SCMs.

3.4 MS4

Routine maintenance of the MS4 system will be integrated into the daily operations of the Public Works Division. Routine maintenance of the MS4 involves pro-active maintenance, such as clearing blocked inlets when noted, as well as prompt response to maintenance needs reported by citizens. As part of their routine, "day to day" duties, Public Works staff will:

- Document inlets, catch basins, and pipes blocked or containing debris and sediment;
- Document street side ditches/swales that are eroding, blocked or improperly functioning;
- Investigate citizen concerns and drainage complaints;
- Complete documented maintenance at that time of discovery or schedule and complete routine maintenance within two weeks of identification.
- Track the amount of sediment/debris removed from the MS4, including the linear feet of ditches/swales that are maintained.

This routine maintenance is in addition to maintenance identified through the neighborhood assessments described in Section 2 of this document. Routine maintenance and citizen requests will be mapped using GIS and if warranted the

routine maintenance items may be included with more comprehensive maintenance identified in those assessments.

4. Spill Response Procedures

The Town's Spill Prevention, Control and Countermeasure Plan describes the procedures established to respond to and prevent spills. The plan outlines procedures for spill contingency, training, security, discharge prevention, and evaluation of risk. The plan also provides an inventory of storage facilities and specifies discharge and drainage controls. The Town of Hillsborough Safety and Risk Manager developed this plan and will be responsible for updating the plan periodically with input from facilities managers and stormwater staff.

5. Pesticide, Herbicide and Fertilizer Application Management

As part of this plan, town operations will include practices that minimize the use of pesticides, herbicide, and fertilizer and ensure the proper use, handling, storage, and disposal of these products. Training workshops will include an overview of pollution prevention practices relevant to municipal use of pesticide, herbicide, and fertilizer. Within each department, supervisors will be responsible for ensuring that employees and contractors are properly trained in pesticide, herbicide, and fertilizer application and all permits, certifications, and other measures for applicators are followed. Appendix A outlines specific practices that staff will follow to ensure proper use and minimize stormwater pollution from these products.

6. Training

The goal of the training program is to provide staff with the resources needed to successfully minimize or eliminate stormwater pollution during daily town operations. While the inspection program works directly with specific staff, the training program is broader in scope and includes all town staff. The program will provide a variety of training opportunities to accommodate staff needs and availability. These opportunities will include training workshops and on-line educational resources.

6.1 Training Workshops

Stormwater staff will conduct in-person training workshops available to all town employees. These workshops will include an overview of the Town's Phase II Stormwater permit and program. Then, the workshops will provide interactive training on pollution prevention, covering prevention strategies relevant to all town facilities and operations. Staff training on IDDE may coincide with pollution prevention training as appropriate. The workshops will be offered at least once during the permit cycle. Training materials will be reviewed and updated prior to each training.

6.2 On-line Resources

Staff will have access to on-line educational resources for pollution prevention. These resources will include an introductory video and reader-friendly materials

that explain the Town's Phase II Stormwater permit and program and approach to pollution prevention. These materials are currently under development. Once produced and available on the employee website, use of the materials will be promoted to all staff. The on-line materials will also be used to provide training to all new hires, which will be coordinated through the Human Resources manager or designee.

6.3 Additional Training Opportunities

As resources allow, the Town will consider additional staff training opportunities. These opportunities may include:

- Informational signs posted at locations where regular activities may have the most impact to stormwater;
- Application of training tools developed by the Environmental Protection Agency (EPA), North Carolina's Department of Environmental Quality (NCDEQ);
- Informal visits to facilities;
- Invitations to collaborate on pollution prevention projects;
- Incentives to attend workshops or use on-line training materials.

Plan updates will evaluate these opportunities for more formal inclusion in the OMP.

6.4 Training Log

A spreadsheet-based training log will be maintained that list all current employees and the date of their most recent training. The log will be used to evaluate staff participation and inform plan updates. If the training log indicates that less than 75% of staff have received training during the permit cycle, the plan will be re-evaluated to improve employee participation,

7. Vehicle and Equipment Cleaning

The Town provides a covered vehicle wash area located at the Fleet Maintenance Facility. The wash area consists of a concrete pad that drains to an oil and water separator, which then drains to the sanitary sewer. A roof covers the entire vehicle wash area. Staff who operate vehicles are instructed to use this wash area for all vehicle and equipment cleaning. Appendix A outlines detailed practices related to vehicle and equipment cleaning.

8. Implementation

This OMP was developed using the Town's *Good Housekeeping/Pollution Prevention Plan* that was initially developed under the Town's previous permit. The OMP combines pollution prevention with operation and maintenance for both facilities, town-

owned properties and town-owned SCMs. This is a working document intended to be updated regularly.

The stormwater program manager or designee will be responsible for implementation of the OMP. Standard Operating Procedures are (or have) being developed to support implementation of the plan components. Electronic forms, databases, and other technology will be used to for communication and record-keeping purposes. While many plan components were implemented prior to plan development, official plan implementation will begin immediately following the adoption of this plan. New plan components, and any components added during plan updates, will be implemented within one year following plan development.

9. Future Updates

As previously mentioned, this is a working plan. The OMP will be updated periodically, and additional details will be added as necessary. At least once annually, the OMP will be evaluated by the Stormwater Program Coordinator or designee. The evaluation will be conducted following the annual report preparation process and completed by November 30 each year. This will allow staff to determine effectiveness of plan components and make changes if warranted. Changes to the OMP that affect the Town's Stormwater Management Plan (SWMP) will be noted in the SWMP.

APPENDICES

Appendix A

Pollution Prevention and Good Housekeeping Best Management Practices

POLLUTION PREVENTION AND GOOD HOUSEKEEPING BEST MANAGEMENT PRACTICES

Hazard Communication

- Ensure MSDSs are available and accessible in the work area
- Ensure containers are properly labeled
- Provide HAZCOM training to employees
- Ensure proper personal protective equipment is available and used when required

Housekeeping

- Maintaining dry and clean floors
- Clean up dry loose debris with brooms before using wet cleaning to prevent solids from discharging to drains
- Use drip pans
- Use dry cleanup methods to collect spills
- Clean up spills promptly and thoroughly
- Regularly pick up and disposing of garbage, debris, and waste materials
- Keep all areas exposed to stormwater clean and orderly
- Inspect drains, loading docks, outdoor storage and waste collection areas daily for signs of contamination
- Ensure areas are free from tripping hazards, adequately illuminated.
- Remove combustible scrap, debris, and waste from the work site promptly

Preventative Maintenance

- Inspect and maintain storm water management devices and equipment designed to prevent spills, leaks, erosion, and flooding
- Regularly clean stormwater catch basins, sediment traps, and oil-water separators to remove debris and make sure that the systems are working properly
- Regularly inspect, test, clean, repair, and replace chemical handling equipment such as pumps, hoses, and seals on a regular schedule.

Loading and Unloading Procedures

Prior to loading and unloading inspect areas

- Check for leaks from tanks, containers, and/or equipment
- Check for stained concrete and/or soil
- Check to ensure fire extinguishers are in place and operative
- Check to ensure inlet protection is available
- Check to ensure a spill kit available, adequate, and fully stocked and adequate
- Check secondary containment
- Check to ensure drain for secondary containment is closed

Loading and Unloading Procedure

- Check incoming vehicles and equipment for leaks
- Have the driver sign in with the operator and obtain a copy of these instructions
- Notify the appropriate maintenance/utility personnel
- Have appropriate maintenance/utility personnel conduct the tank truck to the unloading area
- Have the truck driver position his truck in the proper manner as directed by the maintenance/utility personnel
- Have the driver set the hand brake, shut off his truck engine, and remove the key
- Place a sign "WARNING TRUCK UNLOADING" at the front and rear of the tank truck
- The maintenance/utility personnel will provide a bucket for placement under the tank valves.
- The maintenance/utility personnel will supervise the hooking up of the tank truck to the proper fill line.
- Instruct the driver and the maintenance/utility personnel to stay in sight with an unobstructed view of the hookup during unloading
- Notify appropriate personnel in the event of a spill and request assistance, if necessary.
- When unloading has been completed, check tank line valves and close and lock all fill caps. Have the driver close the valves on the tanker
- Check for any evidence of oil leaked during the unloading operation and take appropriate clean-up action
- Check the drains and outlets on tank trucks for leakage prior to departure

Spill Response

All spill response should be conducted with safety in mind first and protection of the environment and property as a secondary concern. In general, response to spills that can be handled by personnel on-site and the time of the spill should be conducted as follows:

- Provide and maintain emergency spill kits in designated areas
- Safety is First and foremost – Don't take risks
- Keep people away from the area where the spill occurred
- Do not touch or walk in the spilled material
- Be on the guard for any gas or vapor
- Stay up wind and at a higher elevation
- Do not inhale any gases, fumes, or smoke
- Stop the spill at its source if it can be done safely. Close valves, shut down pumps, and/or rotate or upend leaking containers
- Cover drains and/or protect storm sewer
- Dig a ditch or use absorbent material or sand to build a temporary berm to prevent entry into water or sewer
- Pump or remove access material
- Use absorbent material or sand to clean up the spill
- Collect and package used absorbent for disposal
- Report spill and arrange for waste pick-up

Response to spills that present a risk to health or safety of personnel should be conducted as follows:

- Evacuate area to ensure personnel safety
- Set up barricades to keep people away from the area
- Notify appropriate emergency response personnel

Complete and submit a Spill Incidence Report. Maintain records, including:

- Name and telephone number of individual who discovered and/or reported spill
- Location of spill and waters involved
- Time spill was observed
- Cause and circumstance of spill
- Source of spill
- Existing or potential hazards
- Personal injuries or casualties, if any
- Type of material released
- Volume of spill
- Type of cleanup operation, time initiated, and approximate time table to control contain and clean up spill
- Effectiveness of the cleanup operations
- Weather conditions

- Persons on the scene and a contact person

Proper Material Storage and Handling

- Store drums and containers of chemicals and wastes away from direct traffic routes
- Follow procedures when loading, unloading, or transferring materials, chemicals, fuels, and waste
- Use the appropriate equipment when handling chemicals
- Store materials, waste and used oil in appropriate areas
- Store containers inside and on pallets or similar devices whenever possible
- Place secondary containment under containers

Often the most reliable method used to reduce pollutants in storm water runoff is to eliminate potential exposure.

- Move maintenance activities indoors or under a roof
- Divert run off away from areas where chemicals are used or stored
- Equipment and materials that are not directly associated with loading or unloading activities should be stored indoors
- If activities are conducted outdoors cover all storm drains and clean up immediately after each activity and/or at the end of the day.

Aboveground Storage Tanks

- Check and maintain the condition of all tanks, piping systems, and valves in good condition
- Check and maintain alarm systems
- Check and maintain level indicators
- Check and maintain spill containment in good condition
- Check to ensure tanks are constructed of materials compatible with the substance stored
- Check to ensure appropriate containment and diversionary structures prevent discharged materials from reaching waters of the state
- Construct tanks with secondary containment or store in an area that can contain the entire contents of the tank
- Lock fill and discharge ports when not in use
- Label tanks with contents
- Coat tanks and associated piping to prevent corrosion and degradation
- Inspect water being drained from secondary containment for the presence of oil before discharging. In the event that oil is present, it must be collected and disposed or recycled
- Inspect tanks on a weekly basis
- Maintain weekly inspection records, Material Safety Data Sheets, training records, design specifications/manufacturer's data, and testing/repair records
- Separate chemicals which will react with each other

Underground Storage Tanks

- Track throughput (input/output) of materials in the tank to aid in release detection
- Register all USTs with the state
- At least annually, Test USTs and piping for integrity
- Perform and document daily monitoring
- Perform and document weekly UST Inspections
- Maintain maintenance records
- Maintain annual Integrity Test Record
- Maintain current notification
- Maintain records of releases or reports when there has been a loss of contents

Flammable and Combustible Storage

- Store all flammable or combustible in designated areas (i.e., no storage in stairways, passageways, or near exits)
- Store flammable materials in OSHA approved containers with self-closing lids and flash arrestors
- Locate at least one fire extinguisher outside the storage room within 50 feet of the door
- Provide adequate containment
- Label all containers as to their contents and post “Danger No Smoking” signs
- Provide an emergency communication phone
- Use approved containers, tanks, and cabinets to store flammable and combustible liquids
- Keep all flammable liquids in closed containers when not in use
- Ground and bond flammable liquid containers when adding or removing material
- Provide storage rooms for flammable and combustible liquids with explosion proof lights and adequate ventilation
- Select and provide fire extinguishers for the types of materials in the areas where they are used
- Mount appropriate fire extinguishers within 75 feet of outside areas containing flammable liquids and within 10 feet of any inside storage area
- Provide free and unobstructed access to fire extinguishers
- Service, maintain and tag fire extinguishers at intervals not exceeding one year
- Use safety cans for dispensing flammable or combustible liquids
- Clean up spills promptly
- Adequate vent and storage tanks and equip with emergency venting

Compressed Gas Cylinders

Compressed gas cylinders can be extremely hazardous if stored improperly. Ruptured cylinders can create missile hazards, or cause chemical exposure, fire or explosions. Compressed gases include nitrogen, oxygen, propane, breathing air, carbon dioxide, and acetylene.

- Place cap on cylinder when not in use
- Store compressed gases in a secure, upright position
- Separate flammable gases from oxidizers by a minimum of 20 feet, or a 1 hour fire wall, at least 5 feet in height
- Mark and clearly identify contents of gas cylinders
- Place valve protectors on cylinders when not in use or connected for use
- Separate full cylinders from empty cylinders
- Secure cylinders with chains or other restraints
- Keep away from high traffic areas
- Keep away from heat or direct sunlight
- Return cylinders when empty
- Store 50 feet from occupied buildings
- Do not subject to freezing temperatures
- Keep cylinders in an approved storage area
- Never use wrenches or other tools, except those provided or approved by the manufacturer
- Withdrawal rate must not exceed manufacturer specifications
- Maintain records of weekly inspections

Petroleum, Oils, and Lubricants (POL) Storage

Proper storage of POL can prevent costly spills and reduce hazards. Spills of POL cause product loss, increase environmental management costs, and require personnel to divert their attention away from other activities.

- Do not store with incompatible materials
- Close and secure containers
- Keep spill kits near any location where POL is used or stored
- Keep fire extinguisher nearby
- Store away from high traffic areas
- Store away from or near sources of high heat or open flames
- Install NFPA markings on buildings and containers for hazard communication
- Maintain MSDSs
- Maintain accurate inventories
- Maintain good housekeeping
- Inspect dispensing systems daily for leaks, spills, and corrosion
- Maintain a daily inspection log and weekly inspection records

Used Oil Storage

Standards for the management of used oil are found in 40 CFR 279. Requirements include labeling, storage and disposal prohibitions. Whenever possible, recycle used oil. Most local governments should be able to take advantage of local commercial recyclers that can handle their material and exchange of used oil when purchasing new oil.

- Check the area around the storage for signs of leaks or spills
- Store used oil in containers or tanks that are secure, protected from weather, and in good condition (No excessive rust, dents, punctures, free of visible leaks, etc.)
- Store containers in a secure area that has secondary containment
- Do not mix used oil with other waste materials
- Label containers with the words "Used Oil"
- Promptly clean up any spills of used oil
- Close containers when not adding or removing used oil
- Recycle used oil through an approved vendor
- Maintain shipping manifests and used oil storage inspections
- Do not use of waste oil for dust suppression and weed control

Solid Waste Collection

Solid waste management helps prevent fires, storm water pollution, and helps control disease-carrying vectors. Collection of waste must be performed in a safe efficient manner, prevent fires, safety hazards, pest harborage and disease carrying vectors. The number and size of containers must be sufficient to prevent overflow of waste.

- Keep all solid waste in appropriate containers.
- Never place waste outside where it is exposed to stormwater.
- Empty containers that collect food waste at least weekly to reduce pest harborage and disease transmission
- Provide lids and cover all outside trash containers to prevent pests from entering containers, to contain trash and debris, and to prevent exposure to stormwater.
- Close all outside trash containers in areas that may come into contact with precipitation to prevent storm water collecting in the containers and becoming contaminated
- Inspect all trash collection frequently
- Store potentially flammable or combustible waste materials a minimum of 50 feet from occupied buildings
- Do not dispose of liquids in solid waste containers without containing the liquid in a properly sealed container. Follow Orange County Solid Waste guidelines for proper disposal.
- Completely empty pressurized containers, such as aerosol cans, before disposal and follow the above guidelines for liquids disposal.
- For latex paint, open containers and dry paint completely before disposing in landfill. When drying paint, set the containers in a location where they are not exposed to stormwater.
- For non-latex paint, follow Orange County Solid Waste guidelines for proper disposal.
- Do not dispose of tires - tires are to be recycled

- Post signs on trash containers listing prohibited items, such as: “No Hazardous Waste, No Recyclable Materials, and No Liquids”

Contact the trash hauler or landfill for prohibitions on waste that may be disposed. Periodically inspect waste haulers while on-site to ensure that they are performing their work in a clean and compliant manner. Maintain records of disposal permission letter from landfill operator and solid waste weekly inspection.

Vehicle and Equipment Storage, Maintenance, and Washing

- Regularly inspect equipment that could result in leaks/ spills
- Ensure all stored equipment is free of leaks and drips
- Where practical perform maintenance activities indoors
- Puncture oil filters and completely drained before recycling/ disposal
- Do not pour liquid waste down drains
- Properly segregate, label and discard waste materials
- Recycle engine fluids and batteries
- Drain fluids and properly store wrecked vehicles and equipment

Wash Areas

- Use nontoxic cleaning compounds
- Use soaps and detergent that are designed for use in oil water separators
- Use phosphate-free and bio-degradable detergents
- Contain wash water or otherwise keep out of the storm drainage system
- Perform cleaning operations indoors or 1) ensure wash-water drains to the sanitary sewer system, 2) collect runoff and providing treatment or recycling, or 3) provide equivalent measures. If sanitary sewer is not available and cleaning operations take place outdoors, the cleaning operations shall take place on grassed or graveled areas to prevent discharges of the wash water into the storm drains or surface waters.
- Where cleaning operations cannot be performed as described above and when operations are performed in the vicinity of a storm drainage collection system, the drain is to be covered with a portable drain cover during clean activities. Any excess water shall be removed and properly handled prior to removing the drain cover.
- The direct discharge of vehicle and equipment wash waters, including tank cleaning operations, are not authorized and must be covered under a separate NPDES permit or discharged to a sanitary sewer in accordance with applicable industrial pretreatment requirements

Fueling

- Fuel tanks are to be filled carefully without allowing over-splash
- Protect fueling areas from precipitation and run-on or run off
- Avoid washing down fueling area with water

Pesticide, Herbicide, and Fertilizer Application

- Maintain current applicator licenses for any staff who apply pesticides or herbicides.
- Require applicator licenses for any contractors performing pesticide or herbicide application.
- Strictly follow recommendations from the product manufacturer, including application rates, safe handling, storage, and disposal.
- Limit the use of herbicides to areas where weed trimming cannot be used (e.g. gravel areas where air-borne gravel can damage equipment).

- Limit fertilizer use to one-time applications for establishing vegetation.
- Limit insecticide use to 1) routine building maintenance and 2) as needed for staff or public safety.
- Maintain required documentation for all pesticides, herbicides, or fertilizers stored at town facilities.

Parts Washers

Depending on the solvent selected, organic solvent parts washers may generate hazardous waste and air pollution. The use of self-contained parts washers is an effective means of recycling solvents and preventing contamination of wastewater. However, solvent selection can have environmental consequences. Most units can operate using a variety of solvents that can be supplied by the respective vendor. Waste solvents, that are flammable (flashpoint less than 140^{o}F), must be managed as hazardous waste. The increase in compliance management activities often negates any savings achieved through solvent performance. A non-hazardous solvent with a higher flashpoint is generally less expensive to purchase and manage.

- Remove gross contamination before placing in parts washer
- Use solvents with a flashpoint of 150^{o} F or greater
- Keep lids closed
- Keep a spill kit nearby
- Keep fire extinguisher nearby
- Drain parts/equipment containing fluids (oil, hydraulic oils, radiator fluids, etc.) prior to placing into parts washer
- When parts are washed, allow excess solvent to drain back into the parts washer
- Inspect weekly
- Maintain the MSDSs for solvent, disposal records, and a weekly inspection log.
- Dispose of contaminated solvent per manufacturer's recommendations

Oil Water Separators (OWS)

OWS can be effective at removing oil from wastewater. They are used primarily on wash racks and equipment storage areas where there is the potential for oil to leak onto the ground. OWS remove oils by trapping floating oil in one section, allowing water to flow out, and allowing sand, grit, sludge, and heavy grease to settle. The water then flows to the sewer or other treatment. Separators must be cleaned periodically to ensure proper operation. Liquids must be pumped from the collection basin into a drum for disposal as used oil. Solids must be placed into an open top drum, sealed, and labeled. Samples must be analyzed and the material must be sent for disposal, as appropriate. Most septic tank cleaning service companies can pump separators and dispose of the waste.

- Post signs giving instructions for use
- Label all piping including the direction of flow
- Do not allow the direct disposal of petroleum, oil, or lubricants (POL) in an OWS
- Do not add unauthorized chemicals
- Do not use soaps or detergents that are not intended for use in OWS
- Keep mud and other debris out of OWS when possible
- Perform visual inspection daily and weekly written inspections
- Clean out the OWS according to manufacturer's recommendations
- Maintain weekly inspection, maintenance, cleaning, and disposal records

Hazardous Waste

- Document the amount and kinds of Hazardous Waste generated
- Document how waste are determined to be Hazardous Waste (i.e., knowledge and/or testing)
- Maintain copies of completed manifests and land disposal notifications used to ship hazardous wastes for at least 3 years
- Store Hazardous Waste in proper containers or tanks
- Properly mark and date Hazardous Waste containers or tanks
- Secure, closed, protected from weather, Hazardous Waste containers
- Store Hazardous Waste in containers that are compatible with the contents, properly grounded, and in good condition
- Provide adequate aisle space and secondary containment
- Provide adequate spill response equipment
- Provide an emergency communication phone or radio

Used Antifreeze

Used antifreeze can be toxic. Used antifreeze must be collected for proper management. Most facilities should be able to take advantage of local commercial recyclers that can handle their material.

- Label containers accumulating used antifreeze with the words "Used Antifreeze"
- Contracts must be with licensed vendors to provide for exchange of used antifreeze when purchasing new antifreeze
- Store used antifreeze in antifreeze containers only
- Do not mix oil or other chemicals with used antifreeze
- Store containers in a secure area
- Close containers when not adding or removing used antifreeze
- Maintain shipping records and used antifreeze storage weekly inspections

Used Oil Filters

- Puncture used oil filters on the closed end of the filter and allow to drain for 24 hours before recycling or discarding
- Document approval from the landfill or recycler before disposal or recycling
- Maintain recycle and/or disposal records

Universal Waste

EPA developed Universal Waste (UW) regulations, which are less restrictive than Hazardous Waste regulations, to manage batteries (nickel-cadmium and mercury), mercury containing lamps and thermostats, and certain pesticides.

- Label waste with the words "Universal Waste" and the name of the item. The label can be placed on the outside of the package or on the item itself
- Keep materials in a secure area protected from rainfall

- Recycle fluorescent bulbs unless permission is received from the local landfill for disposal
- Use fluorescent lamps that are low-mercury. They typically have a green cap on one end of the tube. These can be discarded into general trash.
- Place universal waste fluorescent lamps in the original package and mark the package with the words “Universal Waste Lamps” and the date that the first tube was placed in the package;
- Send universal waste lamps to be recycled every 11 months to keep from violating storage time provisions
- Maintain manifests/bill of lading for three years
- Document shipments - include the name and address, the name and address of the destination facility, quantity of each type of UW, and the date shipped and received
- Inform employees who handle or have responsibility for managing universal waste on proper handling and emergency procedures appropriate to the type(s) of universal waste handled

Aerosol Cans

Aerosol cans may create fire and safety hazards for solid waste management and release hazardous substances to air.

- Aerosol cans containing hazardous materials must be completely emptied before disposal
- Puncture aerosol cans with an aerosol can puncturer
- Capture and properly dispose of liquids and vapors - contents of the cans may be hazardous
- Completely empty cans of their contents, including propellant, and discarded into general trash or recycled

Used Tires

- Store used tires 50 feet from permanent buildings and equipment
- Stack tires neatly with adequate access for fire-fighting equipment
- Store used tires flat on their side or covered with a tarp to prevent water from collecting within the cavity of the tire, which will help prevent pest harborage and mosquito-borne illness
- Maintain shipping records and monthly inspection records

Recycling

Recycling activities reduce waste disposal costs. Recyclable materials must be stored in a manner that prevents fires and pest harborage. If appropriate, reuse purchased items and their packaging materials and recycle items that have exceeded their useful life, if economically feasible. Evaluate and document the economic feasibility of recycling. A proper evaluation includes generation rates, labor costs, and disposal costs for items being considered.

- Train personnel on recycling procedures
- Label containers with their contents
- Properly segregate materials to prevent fire, health, or safety hazards
- Properly contain or bundled recycled materials so as not to result in spillage or leaks
- Inspect recycling areas at least monthly
- Maintain recycling inspection records and track the volume of wastes recycled

Absorbent Materials

Generally, absorbent materials such as dry sweep, floor dry, absorbent pads, etc., used to clean up small spills may be disposed of in Subtitle D Landfills if certain conditions are met. Subtitle D Landfills are required to prohibit disposal hazardous waste and materials that have free liquids. Contact the local landfill to receive permission to dispose of incidental quantities of absorbent materials.

- Disposed of absorbent materials used to clean up spills according to instructions from the local landfill
- At no time should the absorbent materials be shipped off-site if oil or liquids is leaking from the material
- Mark containers used to store contaminated absorbent materials with the words “Used Absorbent Material”
- Contact local landfill for permission to dispose of contaminated materials
- Maintain disposal permission information

Erosion and Sediment Controls

To prevent sedimentation from reaching surface waters, erosion and sediment controls must be used wherever land is disturbed. These controls may include fabric silt fences, hay bales, sediment retention ponds, check dams or earthen dikes, and vegetation buffers.

- Use proper erosion and sediment controls
- Inspect erosion and sediment controls after significant rain events and repair as required
- Seed or sod disturbed areas as quickly as possible.

PCB Articles

PCBs are believed to cause serious human health effects. Federal regulations prescribe methods for marking and disposal of PCBs. Additionally, the use of PCBs is limited to a totally enclosed manner to ensure that any exposure of human beings or the environment to PCBs will be insignificant.

Fluorescent light ballasts, manufactured before 1978, unless labeled: “NO PCBs” should be considered PCB fluorescent light ballasts because the small capacitors included as one component of the ballast probably contains PCBs. According to data submitted, ballasts manufactured prior to July 1978 have a better than 50% chance of containing PCBs at 50 ppm or greater in their potting material. Fluorescent light ballasts containing PCBs must be disposed of in a TSCA-approved disposal facility under 40 CFR 761.62.

Not all fluorescent light ballasts contain PCBs. Ballasts manufactured between July 1978 and July 1998, require a "No PCB" label indicating that they do not contain PCBs.

- Inspect ballasts when replacing lamps
- Remove suspected or known PCB ballasts from the fixture and place in a container, of adequate size, with a lid that will prevent the spill of liquids (5-gallon buckets and 55-gallon drums are adequate) labeled with the words “Contains PCBs” and the date that the ballast was removed from service
- Line containers with a plastic bag and partially filled with absorbent material to capture any possible spills.
- Place in appropriate storage area labeled with the words “Contains PCBs”
- Inspect storage area monthly recording inspections in a log
- Maintain records of PCB storage area inspections, PCB spill cleanup, and disposal

Batteries (Lead Acid & NiCad)

Lead-acid batteries and nickel-cadmium batteries may be hazardous to human health and the environment if not properly handled.

- Recycle lead-acid and NiCad batteries
- Properly packaged lead acid batteries for recycling (vent caps should be taped to secure them in place, the battery should be wrapped in plastic, secured to the pallet or placed in a rigid container)

- Terminals should not be used to support the weight of other batteries.
- Secure batteries upright as to not tip over and release electrolyte.
- NiCad batteries should be store in a secure, dry area away from flammables
- Label lead-acid and NiCad batteries with the words “Used Battery” and the date taken out of service
- Within one year of date taken out of service, return battery to an approved vendor

Batteries (Lithium)

Lithium batteries are water reactive and can explode when in contact with water. The rapid rise in heat can cause injuries or fires. The purpose of this work instruction is to provide guidelines for the management of spent lithium batteries.

Waste Lithium-Sulfur Dioxide batteries, frequently used in communications equipment, are considered hazardous waste until the Complete Discharge Device (CDD) on the battery, if available, has been activated. Until the battery has been properly deactivated, all the rules of hazardous waste management apply (accumulation time, labeling, manifest tracking, inspections, etc.).

Only trained personnel will perform deactivation. Metal objects must not be used to deactivate lithium batteries. The latest CDDs require removal of a protective sticker, allowing the CDD tab to pop up for deactivation.

- Store Lithium-Sulfur Dioxide batteries in a waterproof container, such as a plastic bag
- Store Lithium-Sulfur Dioxide batteries in a dry, secure area
- If the batteries are stored inside a permanent structure, the area must be equipped with sprinkler protection or a class D fire extinguisher should be nearby
- The local fire department shall review storage practices
- Mark the battery with the date discharged on each battery and properly dispose of all discharged batteries
- Maintain battery discharge training records. All affected personnel must be trained in Lithium battery discharge practices and proper use of Personal Protective Equipment (PPE) and Control Measures on MSDS.
- Weekly inspect Lithium battery storage areas
- Discharging tools must be constructed of wood or plastic

Prior to discharging:

- Mark the date and time of day on the battery
- Remove clear plastic label that covers the CDD completely
- Perform discharging (pressing the CDD button) outdoors with a breeze to disperse the vapors
- Depress the CDD button GENTLY - Ensure that the button is depressed by touch or visual inspection and then remove the tool slowly to ensure that the button stays depressed
- Since lithium batteries react violently with water, place discharging batteries in a covered and secured area on a wooden pallet
- Separate batteries by at least 2 inches on all sides from any objects
- Batteries must discharge for a minimum of 5 - 7 days, but 10 days is recommended for cold weather
- Check all battery CDD buttons after the discharging time period to ensure none have popped back out - on average 10% of the CDD buttons pop back out during discharging
- Check the CDD button by pressing gently and feel for a movement - if you feel no movement the button remained secure and the battery is discharged.

Appendix B
SCM Operation and Maintenance Element Tables

SCM Operation and Maintenance Element Tables

Bioretention Cell

Important operation and maintenance procedures:

- Immediately after the bio-retention cell is established, the plants will be watered twice weekly if needed until the plants become established (commonly 6 weeks).
- Snow, mulch or any other material will NEVER be piled on the surface of the bio-retention cell. Heavy equipment will NEVER be driven over the bio-retention cell.
- Wheeled or tracked equipment will NEVER be driven over the bioretention planting surface.
- Special care will be taken to prevent sediment from entering the bioretention cell.
- If standing water is present 2 days after rainfall, conduct an infiltration test of the soil media.

After the bioretention cell is established, inspect it **quarterly.** Inspection activities shall be performed as follows and maintenance activities shall commence **immediately** to remediate any problems observed per the table below.

SCM element:	Potential problem:	How to remediate the problem:
The entire SCM	Trash/debris is present.	Remove the trash/debris.
The perimeter of the SCM	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil to remove the gully, and plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
	Vegetation is too short or too long.	Maintain vegetation at a height of approximately six inches.
The inlet device	The pipe is clogged.	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged.	Replace the pipe.
	Erosion is occurring in the swale.	Regrade the swale to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems.
	Stone verge is clogged or covered in sediment (if applicable).	Remove sediment and replace with clean stone.
The pretreatment area	Flow is bypassing pretreatment area and/or gullies have formed.	Regrade if necessary to route all flow to the pretreatment area. Restabilize the area after grading.
	Sediment has accumulated to a depth greater than three inches.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and restabilize the pretreatment area.

SCM element:	Potential problem:	How to remediate the problem:
	Erosion has occurred.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand.
The bioretention cell: vegetation	Best professional practices show that pruning is needed to maintain optimal plant health.	Prune according to best professional practices and to maintain lines-of-sight and allow sunlight to reach the mulch surface.
	Plants are dead, diseased or dying.	Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. Provide a one-time fertilizer application to establish the ground cover if a soil test indicates it is necessary.
	Tree stakes/wires are present six months after planting.	Remove tree stake/wires (which can kill the tree if not removed).
The bioretention cell: soils and mulch	Mulch is breaking down or has floated away.	Spot mulch if there are only random void areas. Replace whole mulch layer if necessary. Remove the remaining much and replace with triple shredded hard wood mulch at a maximum depth of three inches.
	Soils and/or mulch are clogged with sediment.	Determine the extent of the clogging - remove and replace either just the top layers or the entire media as needed. Dispose of the spoil in an appropriate off-site location. Use triple shredded hard wood mulch at a maximum depth of three inches. Search for the source of the sediment and remedy the problem if possible.
	An annual soil test shows that pH has dropped or heavy metals have accumulated in the soil media.	Dolomitic lime shall be applied as recommended per the soil test and toxic soils shall be removed, disposed of properly and replaced with new planting media.
The underdrain system (if applicable)	Clogging has occurred.	Wash out the underdrain system.
The drop inlet	Clogging has occurred.	Clean out the drop inlet. Dispose of the sediment off-site.
	The drop inlet is damaged	Repair or replace the drop inlet.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the Stormwater and Environmental Services Division: 919-296-9622

Dry Detention Basin

Important maintenance procedures:

- The drainage area will be managed to reduce the sediment load to the dry detention basin.
- Immediately after the dry detention basin is established, the vegetation will be watered twice weekly if needed until the plants become established (commonly six weeks).
- No portion of the dry detention pond will be fertilized after the first initial fertilization that is required to establish the vegetation.
- The vegetation in and around the basin will be maintained at a height of approximately six inches.
- If cracks, seepage, or woody vegetation is present, consult a dam safety expert for a dam inspection.
- The measuring device used to determine the sediment elevation shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

After the dry detention basin is established, the property owner will inspect it **once a month and within 24 hours after every storm event greater than 1.0 inches**. Records of operation and maintenance will be kept in a known set location on the project site and will be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

SCM Element:	Potential Problem:	How to Remediate the Problem:
The entire SCM	Trash/debris is present.	Remove the trash/debris.
The perimeter of the SCM	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
	Vegetation is too short or too long.	Maintain vegetation at a height of approximately six inches.
The inlet device	The pipe is clogged.	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged.	Replace the pipe.
	Stone verge is clogged or covered in sediment (if applicable).	Remove sediment and replace with clean stone.
The main treatment area	Sediment has accumulated and reduced the depth to 75% of the original design depth.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the SCM. Revegetate disturbed areas immediately with sod (preferred) or seed protected with securely staked erosion mat.
	Water is standing more than 5 days after a storm event.	Check outlet structure for clogging. If it is a design issue, consult an appropriate professional.

SCM Element:	Potential Problem:	How to Remediate the Problem:
	Weeds and noxious plants are growing in the main treatment area.	Remove the plants by hand or by wiping them with pesticide (do not spray).
The embankment	Shrubs or trees have started to grow on the embankment.	Remove shrubs or trees immediately.
	Grass cover is unhealthy or eroding.	Restore the health of the grass cover – consult a professional if necessary.
	Signs of seepage on the downstream face.	Consult a professional.
	Evidence of muskrat or beaver activity is present.	Consult a professional to remove muskrats and beavers.
	An annual inspection by an appropriate professional shows that the embankment needs repair.	Make all needed repairs.
The outlet device	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment off-site.
	The outlet device is damaged	Repair or replace the outlet device.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the Stormwater and Environmental Services Division: 919-296-9622

Constructed Stormwater Wetlands

Important maintenance procedures:

- Immediately following construction of the stormwater wetland, bi-weekly inspections will be conducted and wetland plants will be watered bi-weekly until vegetation becomes established (commonly 6 weeks).
- No portion of the stormwater wetland will be fertilized after the first initial fertilization that is required to establish the wetland plants.
- Stable groundcover will be maintained in the drainage area to reduce the sediment load to the wetland.
- Once a year, a dam safety expert will inspect the embankment.

After the stormwater wetland is established, the property owner will inspect it **once a month and within 24 hours after every storm event greater than 1.0 inches**. Records of operation and maintenance will be kept in a known set location on the project site and will be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

SCM Element:	Potential Problem:	How Property Owner Will Remediate the Problem:
The Entire SCM	Trash/Debris is present.	Remove the trash/debris
The Perimeter of the Wetland	Areas of bare soil and/or erosive gullies have formed.	Re-grade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
	Vegetation is too short or too long.	Maintain vegetation at a height of approximately 6 inches.
The Inlet Device: Pipe or Swale	The pipe is clogged (if applicable).	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged (if applicable).	Replace the pipe.
	Erosion is occurring in the swale (if applicable).	Re-grade the swale if necessary to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.
The Forebay	Sediment has accumulated and reduced the depth that inhibits the forebay from functioning well.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the SCM.
	Erosion has occurred.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand. If cattails or other weeds become invasive and pesticide application is necessary, have a licensed aquatic pesticide applicator treat the weeds by wiping aquatic glyphosate on the leaves rather than spraying.

SCM Element:	Potential Problem:	How Property Owner Will Remediate the Problem:
The Deep Pool, Shallow Water and Shallow Land Areas	Algal growth covers over 50% of the deep pool and shallow water areas.	Consult a professional to remove and control the algal growth.
	Cattails, phragmites or other invasive plants cover 50% of the deep pool and shallow water areas.	Remove the invasive plants by physical removal or by wiping them with pesticide. Do not spray. Consult a professional.
	Shallow land remains flooded more than 5 days after a storm event.	Unclog the outlet device immediately.
	Plants are dead, diseased or dying.	Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. If problem persists, contact the Stormwater and Environmental Services Division: 919-296-9622
	Best professional practices show that pruning is needed to maintain optimal plant health.	Prune according to best professional practices.
	Sediment has accumulated and reduced the depth to 75% of the original design depth of the deep pools.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the SCM.
The Embankment	A tree has started to grow on the embankment.	Consult a dam safety specialist to remove the tree.
	An annual inspection by an appropriate professional shows that the embankment needs repair.	Make all needed repairs.
	Evidence of muskrat or beaver activity is present.	Consult a professional to remove muskrats and beavers.
The Micro-pool	Sediment has accumulated and reduced the depth to 75% of the original design depth.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the SCM.
The Outlet Device	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment off-site.
	The outlet device is damaged.	Repair or replace the outlet device.
The Receiving Water	Erosion or other signs of damage have occurred at the outlet.	Contact the Stormwater and Environmental Services Division: 919-296-9622

Appendix D

Section 6.20 Unified Development Ordinance

6.19 Reserved for Future Codification

6.20 STORMWATER MANAGEMENT

6.20.1 PURPOSE AND INTENT

6.20.1.1 The Town of Hillsborough's planning jurisdiction is located wholly within the Upper Neuse River Basin and the Falls Lake watershed; both nutrient sensitive watersheds. The regulations contained in this subsection are adopted in order to:

(a) protect the water quality of streams within the watershed;
(b) comply with the NPDES System Phase II stormwater requirements; and
(c) comply with the Town's NPDES Phase II Discharge Permit.

6.20.1.2 The regulations are designed to accomplish these goals through the reduction and control of stormwater runoff and by addressing nutrient reductions for both new and existing development. The provisions of this Subsection became effective on October 1, 2007, and are intended to ensure the Town's compliance with their NPDES Phase II Discharge Permit; Session Law 2006-246 and the Falls Nutrient Strategy (15A NCAC 02b.0275, .0277, .0278 and .0282).

6.20.2 APPLICABILITY

The following activities shall be subject to the requirement of this subsection:

6.20.2.1 New and re-development projects creating new impervious surface areas of 10,000 square feet or more in area.

6.20.2.2 New and re-development projects increasing existing impervious surface areas by 10,000 square feet or more in area.

6.20.2.3 Any activity disturbing 10,000 square feet or more of land in order to establish, expand, or modify a residential, commercial or industrial development (including the re-subdivision of land) involving the construction of streets and other impervious features.

6.20.2.4 Any activity disturbing 10,000 square feet or more of land in order to establish, expand, or modify a multi-family residential, commercial, industrial, or institutional development or facility.

6.20.2.5 Any development activity cumulatively disturbing 21,780 square feet (1/2 acre) or more of land in order to establish, expand, or modify a single- or two-family dwelling and their customary accessory structures on an individual lot and not proposed as part of a larger common plan of development or sale.

6.20.2.6 Any development activity cumulatively disturbing 21,780 square feet (1/2 acre) or more of land in order to establish, expand, or modify a recreational development on an individual lot and not proposed as part of a larger common plan of development or sale.

6.20.2.7 The requirements of this subsection do not apply to any work that does not add to, increase, or expand existing impervious surfaces. An example would be the paving of an existing gravel parking lot with asphalt provided the area of the parking lot is not expanded in any way.

6.20.3 DEVELOPMENT STANDARDS

6.20.3.1 Low-Density Projects

Low-density projects shall implement stormwater control measures that comply with all of the following standards:

(a) Stormwater runoff from the development site shall be transported from the development site by vegetated conveyances to the maximum extent practicable.

(b) Nutrient load contributions leaving the site must meet the most current loading rates adopted by NCDWQ requirements of *Section 6.20.4, Nutrient Load Calculation*.

(c) At a minimum, the development shall not result in a net increase in peak flow leaving the site from pre-development conditions for the one-year, 24-hour storm event.

(d) All impervious surface areas shall meet the riparian buffer requirements found in *Section 6.20.16, Riparian buffers*.

(e) The approval of the stormwater permit shall require an enforceable restriction on property usage that runs with the land, such as recorded deed restrictions or protective covenants, to ensure that future development and redevelopment maintains the site consistent with the approved project plans.

6.20.3.2 High-Density Projects

High-density projects shall implement stormwater control measures that comply with each of the following standards:

(a) Must control and treat runoff (generated from all surfaces) from the first inch of rain. Runoff volume drawdown time shall be a minimum of 48 hours, but not more than 120 hours.

(b) All structural treatment systems used shall be designed to have a minimum of 85% average annual removal for Total Suspended Solids.

(c) General engineering design criteria for all projects shall be in accordance with 15A NCAC 2H .1008(c), as explained in the Stormwater Design Manual.

(d) Nutrient load contributions leaving the site must meet the requirements of *Section 6.20.4, Nutrient Load Calculation.*

(e) At a minimum, the development shall not result in a net increase in peak flow leaving the site from pre-development conditions for the one-year, 24-hour storm event.

(f) All impervious surface areas shall meet the riparian buffer requirements found in *Section 6.20.16, Riparian Buffers*.

(g) The approval of the stormwater permit shall require an enforceable restriction on property usage that runs with the land, such as recorded deed restrictions or protective covenants, to ensure that future development and redevelopment maintains the site consistent with the approved project plans.

6.20.4 NUTRIENT LOAD CALCULATION

6.20.4.1 Nitrogen and phosphorous loads contributed by the proposed new development shall not exceed the following unit-area mass loading rates: 2.2 and 0.33 pounds per acre per year for nitrogen and phosphorous, respectively.

6.20.4.2 Development subject to this ordinance shall attain nitrogen and phosphorous loading rate reductions on-site that meet the following criteria prior to using an off-site offset measure:

(a) 30% or more reduction in both nitrogen and phosphorous loading from the untreated conditions for any single-family, detached and duplex residential development disturbing one-half acre but less than one acre.

(b) 50% or more reduction in both nitrogen and phosphorous loading from the untreated conditions for any single-family, detached and duplex residential development disturbing more than one acre.

(c) 30% or more reduction in both nitrogen and phosphorous loading from the untreated condition for other development, including multi-family residential, commercial and industrial development disturbing 10,000 square feet but less than one acre.

(d) 50% or more reduction in both nitrogen and phosphorous loading from the untreated condition for other development, including multi-family residential, commercial and industrial development disturbing more than one acre.

(e) 30% or more reduction in both nitrogen and phosphorous loading from the untreated condition for proposed redevelopment activities in a designated downtown area that would replace or expand structures or improvements that existed as of December 2006.

6.20.4.3 Total nutrient removal rates of stormwater BMPs and BMPs in a series will be credited and calculated pursuant to the approved accounting tool.

6.20.5 OFFSET PAYMENTS

6.20.5.1 In accordance with subsection 6.20.4.2 above, offset fees may be permitted to meet the nutrient export levels set for new development activities.

6.20.5.2 Offset fees shall be paid to the NCEEP (North Carolina Ecosystem Enhancement Program)
or another private mitigation bank approved by NCDWQ. Offset fees must be used within the Falls Lake Watershed.

6.20.5.3 A developer subject to this ordinance may achieve the additional reductions in nitrogen and phosphorus loading required by this ordinance by making offset payments to the NC Ecosystem Enhancement Program contingent upon acceptance of payments by that Program. A developer may use an offset option provided by the Town of Hillsborough. A developer may propose other offset measures to the Town of Hillsborough, including providing his or her own offsite offset or utilizing a private seller. All offset measures permitted by this ordinance shall meet the requirements of 15A NCAC 02B .0282 and 15A NCAC 02B. 0240

6.20.5.4 Permanent Nutrient Export Reduction Best Management Practices

The following on-site BMPs may be used for reducing nutrients from new developments:

(a) bio-retention

(b) constructed wetlands (c) open channel practices (d) riparian buffers

(e) wet detention ponds

(f) other methods approved by NCDWQ.

The Town encourages applicants to pursue innovative options for treating

stormwater on-site and discourages the use of wet detention ponds for most applications.

6.20.5.5 Total Nutrient Removal Rates

Total nutrient removal rates of stormwater BMPs and BMPs in a series will be credited and calculated pursuant to the approved accounting tool. To receive full nutrient reduction credit, design standards must follow those outlined in the Stormwater BMP Manual. Variances from the design standards may be allowed as approved on a case by case basis.

6.20.6 EVALUATION OF STANDARD FOR STORMWATER CONTROL MEASURES

6.20.6.1 Evaluation According to Contents of Stormwater Design Manual

All stormwater control measures, stormwater systems and stormwater treatment practices (also referred to as Best Management Practices, or BMPs) required under this ordinance shall be evaluated by the Stormwater Administrator according to the policies, criteria, and information, including technical specifications and standards and the specific design criteria for each stormwater practice, in the Stormwater Design Manual. The Stormwater Administrator shall determine whether proposed BMPs will be adequate to meet the requirements of this ordinance.

6.20.6.2 Determination of Adequacy; Presumption and Alternatives

Stormwater treatment practices that are designed, constructed, and maintained in accordance with the criteria and specifications in the Stormwater Design Manual and the approved accounting tool will be presumed to meet the minimum water quality and quantity performance standards of this ordinance. Whenever an applicant proposes to utilize a practice or practices not designed and constructed in accordance with the criteria and specifications in the Stormwater Design Manual, the applicant shall have the burden of demonstrating that the practice(s) will satisfy the minimum water quality and quantity performance standards of this ordinance. The Stormwater Administrator may require the applicant to provide the documentation, calculations, and examples necessary for the Stormwater Administrator to determine whether such an affirmative showing is made.

6.20.7 STORMWATER MANAGEMENT PLAN

6.20.7.1 Required Approval

The permit-issuing authority shall not issue any permits for new development on any land within the Town's planning jurisdiction unless and until a Stormwater Management Plan has been reviewed and approved in accordance with standards found in the *Administrative Manual*.

6.20.7.2 Compliance With Requirements

Any person engaged in mew development activities as defined by this subsection who fails to file a plan in accordance with this ordinance, or who conducts any new development except in accordance with the provisions of an approved Stormwater Management Plan, shall be deemed in violation of this ordinance.

6.20.7.3 As-Built Plans and Final Approval

6.20.7.3.a Upon completion of a project, and before a certificate of occupancy shall be granted, the applicant shall certify that the completed project is in accordance with the approved stormwater management plans and designs, and shall submit

actual "as built" plans for all stormwater management facilities or practices after final construction is completed.

6.20.7.3.b The plans shall show the final design specifications for all stormwater management facilities and practices and the field location, size, depth, and planted vegetation of all measures, controls, and devices, as installed. The designer of the stormwater management measures and plans shall certify, under seal, that the as-built stormwater measures, controls, and devices are in compliance with the approved stormwater management plans and designs and with the requirements of this ordinance. A final inspection and approval by the Stormwater Administrator shall occur before the release of any performance securities.

6.20.8 GENERAL STANDARDS FOR MAINTENANCE

6.20.8.1 Function of BMPs as Intended

The owner of each engineered stormwater control or stormwater BMP installed pursuant to this ordinance or any previous zoning or subdivision ordinance shall maintain and operate it so as to preserve and continue its function in controlling stormwater quality and quantity at the degree or amount of function for which the engineered stormwater control was designed.

6.20.8.2 Annual Maintenance Inspection and Report

6.20.8.2.a The person responsible for maintenance of any engineered stormwater control installed pursuant to this ordinance or any previous zoning or subdivision ordinance shall submit to the Stormwater Administrator an inspection report from one of the following persons performing services only in their area of competence: a qualified registered North Carolina professional engineer, surveyor, landscape architect, soil scientist, aquatic biologist, or person certified by the North Carolina Cooperative Extension Service for stormwater treatment practice inspection and maintenance. The inspection report shall contain all of the following:

(a) The name and address of the land owner;
(b) The recorded book and page number of the lot of each engineered stormwater control;
(c) A statement that an inspection was made of all engineered stormwater controls;
(d) The date the inspection was made;
(e) A statement that all inspected engineered stormwater controls are performing properly and are in compliance with the terms and conditions of the approved maintenance agreement required by this ordinance; and
(f) The original signature and seal of the engineer, surveyor, or landscape architect.

6.20.8.2.b For newly constructed engineered stormwater controls or stormwater BMPs, the Annual Maintenance Inspection and Report must be submitted to the Stormwater Administrator no later than September 1 of each year, beginning one year from the date of the as-built certification and each year thereafter.

6.20.8.2.c Engineered stormwater controls or stormwater BMPs constructed prior to February 28, 2011 pursuant to previous zoning or subdivision ordinances must complete an annual maintenance inspection and submit a report as described in Section 6.20.8.2.a above. The Annual Maintenance Inspection and Report must be submitted to the Stormwater Administrator no later than September 1 of each year.

6.20.9 OPERATION AND MAINTENANCE AGREEMENT

6.20.9.1 In General

6.20.9.1.a Prior to the conveyance or transfer of any lot or building site to be served by a engineered stormwater control pursuant to this ordinance, and prior to issuance of any permit for development requiring a engineered stormwater control pursuant to this ordinance, the applicant or owner of the site must execute an operation and maintenance agreement that shall be binding on all subsequent owners of the site, portions of the site, and lots or parcels served by the engineered stormwater control. Until the transference of all property, sites, or lots served by the engineered stormwater control, the original owner or applicant shall have primary responsibility for carrying out the provisions of the maintenance agreement.

6.20.9.1.b The operation and maintenance agreement shall require the owner or owners to maintain, repair and, if necessary, reconstruct the engineered stormwater control, and shall state the terms, conditions, and schedule of maintenance for the engineered stormwater control. In addition, it shall grant to Town a right of entry in the event that the Stormwater Administrator has reason to believe it has become necessary to inspect, monitor, maintain, repair, or reconstruct the engineered stormwater control; however, in no case shall the right of entry, of itself, confer an obligation on Town to assume responsibility for the engineered stormwater control.

6.20.9.1.c The operation and maintenance agreement must be approved by the Stormwater Administrator prior to plan approval, and it shall be referenced on the final plat and shall be recorded with the county Register of Deeds upon final plat approval. A copy of the recorded maintenance agreement shall be given to the Stormwater Administrator within 14 days following its recordation.

6.20.9.2 Special Requirement for Homeowners' and Other Associations

For all engineered stormwater controls required pursuant to this ordinance and that are to be or are owned and maintained by a homeowners' association, property owners' association, or similar entity, the required operation and maintenance agreement shall include all of the following provisions:

(a) Acknowledgment that the association shall continuously operate and maintain the stormwater control and management facilities.

(b) Establishment of an escrow account, which can be spent solely for sediment removal, structural, biological or vegetative replacement, major repair, or reconstruction of the engineered stormwater controls. If engineered stormwater controls are not performing adequately or as intended or are not properly maintained, the Town, in its sole discretion, may remedy the situation, and in

such instances the Town shall be fully reimbursed from the escrow account. Escrowed funds may be spent by the association for sediment removal, structural, biological or vegetative replacement, major repair, and reconstruction of the engineered stormwater controls, provided that the Town shall first consent to the expenditure.

(c) Both developer contribution and annual sinking funds shall fund the escrow account. Prior to plat recordation or issuance of construction permits, whichever shall first occur, the developer shall pay into the escrow account an amount equal to 15% per cent of the initial construction cost of the engineered stormwater controls. Two-thirds (2/3) of the total amount of sinking fund budget shall be deposited into the escrow account within the first 5 years and the full amount shall be deposited within 10 years following initial construction of the engineered stormwater controls. Funds shall be deposited each year into the escrow account. A portion of the annual assessments of the association shall include an allocation into the escrow account. Any funds drawn down from the escrow account shall be replaced in accordance with the schedule of anticipated work used to create the sinking fund budget.

(d) The percent of developer contribution and lengths of time to fund the escrow account may be varied by the Town depending on the design and materials of the stormwater control and management facility.

(e) Granting to the Town a right of entry to inspect, monitor, maintain, repair, and reconstruct engineered stormwater controls.

(f) Allowing the Town to recover from the association and its members any and all costs the Town expends to maintain or repair the engineered stormwater controls or to correct any operational deficiencies. Failure to pay the Town all of its expended costs, after 45 days written notice, shall constitute a breach of the agreement. In case of a deficiency, the Town shall thereafter be entitled to bring an action against the association and its members to pay, or foreclose upon the lien hereby authorized by the agreement against the property, or both. Interest, collection costs, and attorney fees shall be added to the recovery.

(g) A statement that this agreement shall not obligate the Town to maintain or repair any engineered stormwater controls, and the Town shall not be liable to any person for the condition or operation of engineered stormwater controls.

(h) A statement that this agreement shall not in any way diminish, limit, or restrict the right of the Town to enforce any of its ordinances as authorized by law.

(i) A provision indemnifying and holding harmless the Town for any costs and injuries arising from or related to the engineered stormwater control, unless the Town has agreed in writing to assume the maintenance responsibility for the BMP and has accepted dedication of any and all rights necessary to carry out that maintenance.

6.20.10 INSPECTION PROGRAM

6.20.10.1 Inspections and inspection programs by the Town may be conducted or established on any reasonable basis, including but not limited to routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to, reviewing maintenance and

repair records; sampling discharges, surface water, groundwater, and material or water in BMPs; and evaluating the condition of BMPs.

6.20.10.2 If the owner or occupant of any property refuses to permit such inspection, the Stormwater Administrator shall proceed to obtain an administrative search warrant pursuant to G.S. 15-27.2 or its successor. No person shall obstruct, hamper or interfere with the Stormwater Administrator while carrying out his or her official duties.

6.20.11 PERFORMANCE SECURITY FOR INSTALLATION AND MAINTENANCE

6.20.11.1 May Be Required

The Town may, at its discretion, require the submittal of a performance security or bond with surety, cash escrow, letter of credit or other acceptable legal arrangement prior to issuance of a permit in order to ensure that the engineered stormwater controls are:

(a) installed by the permit holder as required by the approved stormwater management plan**,** and/or

(b) maintained by the owner as required by the operation and maintenance agreement.

6.20.11.2 Amount

6.20.11.2.a *Installation*

The amount of an installation performance security shall be the total estimated construction cost of the BMPs approved under the permit, plus 25%.

6.20.11.2.b *Maintenance*

The amount of a maintenance performance security shall be the present value of an annuity of perpetual duration based on a reasonable estimate of the annual cost of inspection, operation and maintenance of the BMPs approved under the permit, at a discount rate that reflects the jurisdiction's cost of borrowing minus a reasonable estimate of long-term inflation.

6.20.11.3 Uses of Performance Security

6.20.11.3.a *Forfeiture Provisions*

The performance security shall contain forfeiture provisions for failure, after proper notice, to complete work within the time specified, or to initiate or maintain any actions which may be required of the applicant or owner in accordance with this ordinance, approvals issued pursuant to this ordinance, or an operation and maintenance agreement established pursuant to this ordinance.

6.20.11.3.b *Default*

Upon default of the owner to construct, maintain, repair and, if necessary, reconstruct any engineered stormwater control in accordance with the applicable permit or operation and maintenance agreement, the Stormwater Administrator shall obtain and use all or any portion of the security to make necessary improvements based on an engineering estimate. Such expenditure of funds shall

only be made after requesting the owner to comply with the permit or maintenance agreement. In the event of a default triggering the use of installation performance security, the Town shall not return any of the unused deposited cash funds or other security, which shall be retained for maintenance.

6.20.11.3.c *Costs in Excess of Performance Security*

If Town takes action upon such failure by the applicant or owner, the Town may collect from the applicant or owner the difference between the amount of the reasonable cost of such action and the amount of the security held, in addition to any other penalties or damages due.

6.20.11.3.d *Refund*

Within 60 days of the final approval, the installation performance security shall be refunded to the applicant or terminated, except any amount attributable to the cost (plus 25%) of landscaping installation and ongoing maintenance associated with the BMPs covered by the security. Any such landscaping shall be inspected one year after installation with replacement for compliance with the approved plans and specifications and, if in compliance, the portion of the financial security attributable to landscaping shall be released.

6.20.12 NOTICE TO OWNERS

6.20.12.1 Deed Recordation and Indications on Plat

The applicable operations and maintenance agreement, conservation easement, or dedication and acceptance into public maintenance (whichever is applicable)] pertaining to every engineered stormwater control shall be referenced on the final plat and shall be recorded with the County Register of Deeds upon final plat approval. If no subdivision plat is recorded for the site, then the operations and maintenance agreement, conservation easement, or dedication and acceptance into public maintenance, whichever is applicable] shall be recorded with the County Register of Deeds so as to appear in the chain of title of all subsequent purchasers under generally accepted searching principles.

6.20.12.2 Signage

Where appropriate in the determination of the Stormwater Administrator to assure compliance with this ordinance, engineered stormwater controls shall be posted with a conspicuous sign stating who is responsible for required maintenance and annual inspection. The sign shall be maintained so as to remain visible and legible.

6.20.13 RECORDS OF INSTALLATION AND MAINTENANCE ACTIVITIES

The owner of each engineered stormwater control shall keep records of inspections, maintenance, and repairs for at least five years from the date of creation of the record and shall submit the same upon reasonable request to the Stormwater Administrator.

6.20.14 NUISANCE

The owner of each stormwater BMP, whether engineered stormwater control or non-engineered stormwater control, shall maintain it so as not to create or result in a nuisance condition.

6.20.15 MAINTENANCE EASEMENT

Every engineered stormwater control installed pursuant to this ordinance shall be made accessible for adequate maintenance and repair by a maintenance easement. The easement shall be recorded and its terms shall specify who may make use of the easement and for what purposes.

6.20.16 RIPARIAN BUFFERS

6.20.16.1 Purpose and Intent

In order to minimize sedimentation and pollution of surface waters within the planning jurisdiction, riparian buffers shall be provided along all surface waters identified in *Section 6.20.16.3, Applicability*. Undisturbed natural areas along surface waters act as a filter for sedimentation control and as a stabilizing agent for the banks of surface waters. In addition, these areas filter storm water run-off which may carry significant amounts of bacteria, excess nutrients and heavy metals into surface waters. The buffer areas, along with controls on impervious surfaces, provide a good measure of water quality protection for the Eno River.

The Neuse River Basin Nutrient Sensitive Waters Management Strategy riparian buffer protection rules (Neuse Rules) of 15A NCAC 028 .0233 and .0241, apply to all lands within the Town of Hillsborough's planning jurisdiction. Wherever standards of the Neuse Rules and the standards listed in this ordinance differ, the more restrictive provisions shall apply.

6.20.16.2 Delegated Authority

The North Carolina Environmental Management Commission has jurisdiction to the exclusion of the Planning Director or designee to implement the requirements of the State's program for the following types of activities:

(a) Activities undertaken by the State;
(b) Activities undertaken by the United States;
(c) Activities undertaken by multiple jurisdictions;
(d) Activities undertaken by local units of government; and
(e) Forestry Operations

6.20.16.3 Applicability

A riparian buffer shall be established directly adjacent to surface waters (i.e. intermittent streams, perennial streams, lakes and ponds) identified by any of the following means:

(a) Surface water shown as solid blue or purple lines or as broken blue or purple lines on the most recent version of USGS Quadrangle maps;

(b) Surface water shown in the most recent version of the Orange County Soil Survey; or

(c) A surface water identified in a field determination made by staff trained in surface water identification through the North Carolina Division of Water Quality (NCDWQ). Disputes pertaining to water feature decisions by staff shall be filed directly to the Director of NCDWQ.

6.20.16.4 Exemption Based upon an On-site Determination

When a landowner or other affected party including the Division believes that the maps inaccurately depict surface waters, they may request an On-site determination conducted by staff who has successfully completed the Division's Surface Water Identification Training Certification course, its successor, or other equivalent training curriculum approved by the Division. Any disputes over on-site determinations shall be referred to the Director of the Division of Water Resources in writing. A determination of the Director of the Division of Water Resources as to the accuracy or application of the maps is subject to review as provided in articles 3 and 4 of G.S. 150B. Surface waters that appear on the maps shall not be subject to this Rule is a site evaluation revels any of the following cases:

(a) Man-made ponds and lakes that are not part of a natural drainage way that is classified in accordance with 15A NCAC 02B .0110, including ponds and lakes created for animal watering, irrigation, or other agricultural uses. A pond or lake is part of a natural drainage way when it is fed by an intermittent or perennial stream or when it has a direct discharge point to an intermittent or perennial stream.
(b) Ephemeral streams.
(c) The absence on the ground of a corresponding intermittent or perennial stream, lake, reservoir, or pond.
(d) Ditches or other man-made water conveyances, other than modified natural streams.

6.20.16.5 Exemption when Existing Uses are Present and Ongoing

Section 6.20.16, *Riparian Buffers* does not apply to portions of the riparian buffer where a use is considered existing and ongoing according in accordance with 15A NCAC 028 .0233 (3). A use is considered existing if it was present within the riparian buffer as of July 22, 1997. Existing uses shall include, but not be limited to, agriculture, buildings, industrial facilities, commercial areas, transportation facilities, maintained lawns, utility lines and on-site sanitary sewage systems. Only the portion of the riparian buffer that contains the footprint of the existing use is exempt from this Rule.

6.20.16.6 Calculations for Width of Riparian Buffers

The width of the buffer along the Eno River shall be the floodway as shown on the Floodway Map from the National Flood Insurance Program, plus fifty (50) feet. However, in no case, shall the riparian buffer exceed the outer line of the floodplain as shown on the Flood Insurance Rate Map (FIRM) of the National Flood Insurance Program. For streams within the PW and PWCA zoning districts (see *Section 4.5, Other Zoning Districts*), the width of the stream is calculated as outlined in *Section 4.5.3.8.d, Calculating Width of Riparian Buffer*.

In all other cases, a buffer of fifty (50) feet in width measured from the most landward limit of the top of bank, normal water level or rooted herbaceous vegetation of surface waters identified in *Section 6.20.16.3, Applicability*.

6.20.16.7 Permitted Uses Within Riparian Buffers

It is the intent of this section to restrict the use of land adjacent to streams, ponds, lakes and reservoirs in order to reduce sedimentation and pollution. The following uses are permitted within a designated riparian buffer. All other land uses are

prohibited.

Table 6.20.16.7 Permitted Uses within Riparian Buffers			
Riparian Buffer Use		**Allowable**	**Allowable w/Mitigation**
Utilities	Perpendicular crossings of above ground and buried utility lines for local distribution of electricity, telephone, and cable television service, plus accessory and appurtenant apparatus such as poles, guy wires, transformers, and switching boxes, with a construction width of less than or equal to 40 feet and a 10-foot maintenance corridor.	X	
	Perpendicular utility crossings that exceed 40 feet of construction width and/or require more than a 10-foot maintenance corridor through the riparian buffer.		X
	Non-perpendicular riparian buffer impacts for utilities.		X
Water and Sewer	Perpendicular crossings of water and sewage distribution, collection, and treatment facilities, but not private in-ground sewage disposal facilities, with a construction width of less than or equal to 40 feet and a 10-foot maintenance corridor.	X	
	Perpendicular water and sewage crossings that exceed 40 feet of construction width and/or require more than a 10-foot maintenance corridor through the riparian buffer.		X
	Non-perpendicular riparian buffer impacts for public water and sewage distribution.		X
	Water wells	X	

Streets and Bridges	Perpendicular crossings of streets, bridges, and railroad rights-of-way impacting less than 150 feet of riparian buffer.	X	
	Perpendicular crossings of streets, bridges, and railroad rights-of-way that exceed 150 feet of riparian buffer impact.		X
	Temporary access roads disturbing less than 2,500 square feet of riparian buffer provided vegetation is restored within six months of initial disturbance.	X	
	Temporary roads disturbing more than 2,500 square feet of riparian buffer.		X
	Non-perpendicular riparian buffer impacts of streets and railroad rights-of-way		X
Restoration	Stream restoration and/or stream bank stabilization.	X	
	Wetland restoration, in accordance with all applicable local, State and Federal regulations.	X	
	Removal of previous fill or debris provided that diffuse flow is maintained and any vegetation removed is restored.	X	
Stormwater Facilities	Maintenance of existing stormwater outfalls provided they are managed to minimize the sediment, nutrients, and other pollution they convey to waterbodies.	X	
	New drainage outfalls provided that a stormwater management facility is installed to control nutrients and attenuate flow before the conveyance discharges into the riparian buffer.		X
	Engineered stormwater ponds, bioretention and wetlands provided that a riparian buffer meeting the requirements of Section 6.20.16.3 is established.	X	
	Engineered stormwater ponds, bioretention and wetlands where a riparian buffer cannot be established in accordance with Section 6.20.16.3.		X
Maintenance	Drainage of a pond in a natural drainage way provided that a new riparian buffer that meets the requirements of Section 6.20.16.6 is established adjacent the new channel.	X	
	Maintenance activities of existing dams	X	
	Periodic maintenance of modified natural streams	X	
	Protection of existing structures, facilities and streambanks when this requires additional disturbance of the riparian buffer or the stream channel	X	

Miscellaneous	Greenways	X	
	Archeological research and excavation	X	
	Scientific studies and stream gauging	X	
	Fences provided that disturbance is minimized and existing trees and woody vegetation is not disturbed during installation and maintenance	X	
	Ponds in natural drainage ways (excluding dry ponds) provided that a riparian buffer meeting the requirements of Section 6.20.16.3 is established	X	
	Ponds in natural drainage ways (excluding dry ponds) where a riparian buffer cannot be established in accordance with Section 6.20.16.3		X
	Water dependent structures as defined in 15A NCAC 2B .0202	X	

6.20.16.8 Written Authorization Required

Proposed impacts from permitted uses to the riparian buffer may not commence until written authorization is provided by the Planning Director or designee. Use authorization may include conditions specific to the proposed activity. Unauthorized impacts to riparian buffers are subject to enforcement penalties as outlined in *Section 8, Enforcement*.

In order for a permitted use to be authorized, the applicant must demonstrate "no practical alternatives." The determination of "no practical alternatives" will be made by the Planning Director or designee based upon the following:

(a) The basic project purpose cannot be practically accomplished in a manner that would better minimize disturbance, preserve aquatic life and habitat, and protect water quality.

(b) The use cannot practically be reduced in size or density, reconfigured or redesigned to better minimize disturbance, preserve aquatic life and habitat, and protect water quality.

(c) Best management practices shall be used if necessary to minimize disturbance, preserve aquatic life and habitat, and protect water quality.

Prior to any land disturbing activity within a designated riparian buffer, the property owner shall provide written notification of the location and nature of the proposed use to the Planning Director or designee for review. Written notification must include the following:

(a) The name, address and phone number of the applicant;

(b) The nature of the activity to be conducted by the applicant;

(c) The location of the activity;

(d) A map of sufficient detail to accurately delineate the boundaries of the land to be utilized in carrying out the activity, the location and dimensions of any disturbance in the riparian buffers associated with the activity, and the extent of the riparian buffers on the land; and

(e) An explanation of why this plan for the activity cannot be practically accomplished, reduced or reconfigured to better minimize disturbance to the riparian buffer, preserve aquatic life and habitat and protect water quality.

(f) Plans for any best management practices proposed to be used to control the impacts associated with the activity.

6.20.16.9 Diffuse Flow Requirement

(a) Diffuse flow or runoff shall be maintained in the riparian buffer by dispersing concentrated flow and re-establishing vegetation.

(b) Concentrated runoff from new ditches or manmade conveyances shall be converted to diffuse flow before the runoff enters the riparian buffer.

(c) Periodic corrective action to restore diffuse flow shall be taken if necessary to impede the formation of erosion gullies.

6.20.16.10 Mitigation

Where mitigation is required pursuant to the permitted uses listed in Section 6.20.16.6, *Permitted Uses Within Riparian Buffers*, mitigation shall follow the standards set out in the state's consolidated Riparian Buffer Mitigation Rule, 15A NCAC 02B .0295.

6.20.16.11 Riparian Buffer and Minimum Lot Requirements

The riparian buffer may be used in meeting the required minimum lot areas set forth in the Ordinance.

6.20.16.12 Existing Vegetation and New Vegetation in Riparian buffers

Existing vegetation shall not be disturbed within a riparian buffer without prior approval of the Planning Director or designee. Existing vegetation may be augmented within the buffer and invasive vegetation may be removed if the Planning Director or designee approves the plans in advance. Any work done in the riparian buffer must be designed and intended to increase the infiltration capability of the buffer and reduce the velocity of storm water run-off.

In the situation where the required buffer experiences erosion problems due to topography or other existing conditions of the land, the Planning Director or designee shall require that the buffer be planted so that it will function as a sediment and pollutant trap. Such planting shall be completed prior to the issuance of a Certificate of Occupancy.

The use of pesticides, herbicides, or chemicals is not allowed in the riparian buffer except with the prior approval of the Planning Director or designee, and only allowed as described within the Neuse Buffer Rules.

Appendix E

Stormwater/Water Quality Related Policies, Practices and Regulations

Town of Hillsborough
Stormwater/Water Quality Related Polices, Practices and Regulations

Prepared by the Town of Hillsborough Planning Department

1. Natural Resource Protection

    a. The Town's Flood Damage Prevention prohibits new development, with the exception of public parks and utility facilities, in the 100-year floodplain and the floodway. Even the limited development allowed must be designed to minimize flood damage.

    b. The Town's Subdivision Regulations contain the following requirements:
        - The Planning Board is to consider the overall design of a subdivision in light of the land's suitability for development. Suitability is to be determined by investigating the following conditions: flood prone areas, wetlands, soil drainage, drainage patterns, slope, historic sites, and unique natural areas.
        - 50-foot wide stream buffers are required along both sides of water features in areas designated for water supply watershed protection.
        - The Regulations contain a process allowing reductions in lot sizes and clustering of lots in order to preserve floodplains, steep slopes and other unique natural features present on a development site.
        - Requirement that developers of major subdivisions (more than 4 lots) dedicate common open space as part of the development. The goal is to preserve significant natural features and cultural resources.

    c. The Town's Zoning Ordinance contains the following requirements:
        - 50-foot wide stream buffers along both sides of water features located within the Town's planning jurisdiction, provided said streams are indicated on a USGS map, soil survey or identified in the field.
        - Watershed protection standards for areas identified as Water Supply Watershed Protection areas. The requirements mandate maximum impervious surface limits allowed on individual lots, more stringent stream buffer widths than those found elsewhere in the Town's Ordinances, as well as additional building and septic system setbacks from perennial and intermittent streams and water impoundments areas. Clustering of lots to preserve open space for watershed protection is also allowed.
        - Performance standards related to the review and approval of Special Use Permits. One of the standards relates to the preservation of the site's natural state. Specifically, as part of the development process, desirable vegetation or other unique natural features are to be preserved in their natural state when practical.

d. The Town's adopted Vision 2010 Plan (1991, amended 2000) contains the following goals, objectives and recommendations:
    - Maintain and improve Hillsborough's natural and historic resources by creating a preservation plan identifying open spaces and other areas for protection; contacting owners of significant tracts of land to inform them of the financial benefits of dedications and conservation easements, and the use of tax incentives and public acquisition of land.
    - Development and adoption of regulations restricting development of sensitive lands.
    - Conduct full environmental impact reviews for all proposed new developments.
    - Strengthen the floodplain ordinance to go beyond the minimum requirements and prohibit development within floodplains.

e. The Town has and continues to purchase land along the Eno River for use as a greenway (Riverwalk).

f. The Town constructed a large community park adjacent to the Eno River (Gold Park) in 2008/2009.

2. Open Space Protection
    a. The Town currently contains approximately 916 acres of dedicated open space consisting of existing parks, lands dedicated through land subdivision process, and Town-owned greenway land.

    b. The Town's Subdivision Regulations contain the following requirements:
        - Developers of major subdivision developments (more than 4 lots) must dedicate common open space as part of the development.

    c. The Town's adopted Vision 2010 Plan (1991, amended 2000) contains the following goals, objectives and recommendations:
        - Preserve and maintain current open spaces created by a mixture of lot sizes.
        - Maintain and improve Hillsborough's natural and historic resources.
        - Create a preservation plan identifying open spaces and other areas for protection.
        - Contact owners of significant tracts of land to inform them of the financial benefits of dedications and conservation easements.
        - Use of tax incentives and public acquisition of land
        - Town purchase of vacant lots in existing neighborhoods for use as small neighborhood parks.

    d. The Town has and continues to purchase land along the Eno River for use as a greenway (Riverwalk).

e. The Town constructed a large community park adjacent to the Eno River (Gold Park) in 2008/2009.

3. Tree Preservation

a. The Town's Subdivision Regulations contain the following requirements:
   - Protection of exiting vegetation on lots to be created through the major subdivision (more than 4 lots) by designating Primary and Secondary Tree Preservation areas on individual lots. Use of existing vegetation to meet this requirement is encouraged under the Regulations.
   - Planting of street trees in major subdivisions (more than 4 lots).
   - Planted land use buffers of various widths in areas where existing vegetation will not satisfy the buffer requirement. Use of existing vegetation for buffers is encouraged under the Regulations.

b. The Town's Zoning Ordinance contains the following requirements:
   - Screening between incompatible land uses. All screening types include planting of trees. Use of existing vegetation for screening is encouraged under the Ordinance.
   - Parking lots with more than 10 spaces must include interior shaded landscaped islands.
   - Performance standards related to the review and approval of Special Use Permits. One of these standards relates to the preservation of the site's natural state. Specifically, one requirement for the review is that an Environmental Protection Plan be submitted that includes the locations of all existing trees 12 inches or more in diameter as measured 4 feet from ground level.

c. The Town's Historic District Design Guidelines applicable in the Town's Historic District Overlay zoning district contain provisions for the protection of existing trees on individual sites. Specifically, trees 12 inches in diameter measured 4 feet above ground level cannot be removed without approval of the Historic District Commission unless proof is submitted that the tree is diseased or damaged in some manner so that it will not survive. Staff approval may be given for the removal of smaller trees.

d. The Town Code of Ordinances established a Tree Board. This board oversees the planting, removal, and/or pruning of trees located within the public right-of-way (street trees) and on publicly owned properties (parks and town facilities).

d. The Town's adopted Churton Street Corridor Strategic Plan (2006) and US 70/Corneilus Street Corridor Strategic Plan (2007) both recommend that street trees and planted medians be planted as part of corridor improvements.

e. The Town's adopted Vision 2010 Plan (1991, amended 2000) recommends the Town enhance and expand its Tree board and that it inventory significant trees.

4. Redevelopment

    a. The Town's Zoning Ordinance requires sites undergoing redevelopment to meet current zoning standards to the maximum extent feasible. This includes landscaping, buffering, and stormwater management requirements.

    b. The Town's adopted Vision 2010 Plan (1991, amended 2000) recommends the Town require retrofitting and full compliance as part of expansions or redevelopment.

5. Development in Areas with Existing Infrastructure

    a. The Town's adopted Vision 2010 Plan (1991, amended 2000) recommends the Town:
        - Investigate the implementation of an urban growth boundary. The Town has finalized a plan to do this.
        - Limit the approval of utility extension agreements to control the location and timing of development.

6. Mixed-use Development

    a. The Town's Zoning Ordinance contains the following provisions for mixed-use development:
        - Entranceway Special Use District allowing for the development of projects with a mixture of office, commercial and employment uses along primary entrances into Town. Residential uses are also permitted when part of a planned/mixed-use development.
        - Combination Uses (the combination of two or more principal uses on one lot) are permitted in certain zoning districts.

7. Street Design

    a. The Town's Subdivision Regulations currently defer to the NCDOT Subdivision Road standards. The Town does allow private gravel streets that serve 3 or fewer lots. The narrowest street right-of-way width allowed is 50 feet.

    b. The Town's adopted Vision 2010 Plan (1991, amended 2000) recommends the Town allow flexibility in street widths.

8. Green Infrastructure Elements and Street Design
        - The Town's current land use regulations do not contain green infrastructure elements. The Town is currently in the process of writing a UDO (Unified Development Ordinance) and may consider adopting such design elements.

9. Reduced Parking Requirements

a. The Town's Zoning Ordinance allows for the use of shared-parking facilities between uses when the individual uses operate at different hours.

10. Transportation Demand Management Alternatives:

a. The Town does not currently offer incentives or payment in-lieu to allow a reduction in parking.

11. Minimizing Stormwater from Parking Lots:

a. The Town's Zoning Ordinance contains the following requirements:
   - Screening of parking lots from streets and adjacent residential areas. Screening types include planting of trees. Use of existing vegetation for screening is encouraged under the Ordinance.
   - Parking lots with more than 10 spaces must include interior shaded landscaped islands.

12. Green Infrastructure Practices

a. The Town's current land use regulations do not discourage the use of green infrastructure as long as it meets the Town's stormwater requirements as found in the Zoning Ordinance and Subdivision Regulations. The Town is currently in the process of writing a UDO (Unified Development Ordinance) and may consider codifying specific practices as formally being acceptable.

b. The Town requires preliminary approval of stormwater plans as part of the site plan and subdivision review process. Many applications must be reviewed by the Town's Technical Review Committee before the plans are formally reviewed by an approval body. Stormwater issues are normally identified at this stage in the process.

c. The Town generally has no regulations regarding the use of rain barrels, etc. for rainwater harvesting. However, the use of rain barrels and other above-ground rain catching devices may require approval from the Town's Historic District Commission if the property is located in the Historic District Overlay zoning district.

13. Maintenance/Enforcement

a. The Town has begun requiring operation and maintenance plans for stormwater control devices to be recorded with the Register of Deeds Office to ensure perpetual maintenance of stormwater facilities.