

Monroe County Stormwater Management:

Addressing New Urbanscapes with Green Infrastructure

SPEA Capstone Project | Spring 2017

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Background

The Monroe County Highway Department's Stormwater Program and the Monroe County Planning Department seek to improve stormwater quality management in Monroe County. The Stormwater Program in Monroe County consists of Dana Wilkinson (Stormwater Inspector), Terry Quillman (Drainage Engineer), and two SPEA Service Corps Fellows.

Monroe County is a municipal separate storm sewer system (MS4s) and is one of 22 Indiana counties regulated under Rule 13, Indiana's implementation of Phase II of the Clean Water Act. Rule 13 outlines the clean water requirements and requires 6 minimum control measures that the County must comply with, including: public awareness, public participation, illicit discharges, sediment and erosion control practices for construction sites, long term clean water practices such as ponds and rain gardens, and setting good examples with County operations. The Comprehensive Land Use Plan identifies Vulnerable and Undisturbed Land and establishes protective instruments for specific land types. Chapter 761 Storm Water Management is intended to promote the public benefits associated with well-designed and well-maintained stormwater drainage systems, to minimize the external costs and impacts that may arise from substandard storm water drainage systems and maintenance practices, and to achieve and maintain compliance with federal, state, and local water quality and flood damage prevention regulations. The Planning Department is currently revising the Urbanizing Area Plan, which will encourage denser population in certain urban areas and discourage population in environmentally sensitive and undeveloped areas.

In order to accomplish the goal of improving stormwater management in Monroe County, our Capstone identified areas of the Chapter 761-Storm Water Management that needed improvement, proposed revision, and will provide reference to other communities demonstrating how the ordinance was revised. Our Capstone also evaluated the stormwater outreach program, proposed possible changes to the current practices, and developed a community-based outreach manual for stormwater problem areas and residences in Monroe County.

Project Purpose

To improve water quality in Monroe County through stormwater management by:

1. Amending ordinance language to encourage optimal post-construction BMP installation, enforcing stormwater quality standards, and ensuring long-term operation and maintenance of BMPs.
2. Improving the current rain garden outreach program to expand stormwater education, public engagement, and utilization of the rain garden budget.
3. Engaging the residential community to increase prevalence of rain gardens by developing clear, concise, and persuasive stormwater management outreach materials.

Objectives

1. Review 761- Identified areas for improvement
2. Case Studies
 - a. Identified successful programs with similar demographics
 - b. Compiled case study information as evidence of need for revision
3. Amend 761
 - a. Evaluated and moved technical language to appendices
 - b. Refined scope, intent, purpose, policies
 - c. Expanded water quality standards
 - d. Retooled language to enforce/define BMP maintenance requirements
4. Partnered with Bloomington High School South to restore their existing rain garden
 - a. Developed restoration plan for 2017
 - b. Developed long-term maintenance and expansion plan
 - c. Identified site for future rain gardener certification workshops
 - d. Developed educational opportunities for students
5. Partnered with local environmental consulting firm Ecologic to coordinate BHSS rain garden maintenance and 2017 rain gardener certification workshops
6. Created rain gardener certification program:
 - a. Arranged workshops at demonstration gardens
 - b. Created reimbursement plan for residents installing home rain gardens
 - c. Handbook for public participants
 - i. Size
 - ii. Plants
 - iii. Upkeep
7. Created an educational outreach manual for residential community
8. Produced comprehensive manual for Monroe County personnel

Scope

Our project provided Monroe County Stormwater with a proposed amended ordinance which includes an emphasis on water quality and post-construction requirements as well as a community education and outreach plan. Due to time constraints, Monroe County Stormwater will need to take over further revisions, passing the amendment, implementing the new standards, providing funding, and executing community engagement.

Project Deliverables

1. Formed partnership with local school-Bloomington High School South
2. Created rain garden restoration and long-term maintenance plan and budget for BHSS

3. Formed partnership with local firm Ecologic to host Rain Gardener Certification workshops
4. Created Rain Gardener Certification Program Guide
5. Comprehensive manual for Monroe County personnel
6. Amended Stormwater Management Ordinance, Ch. 761
7. Presentation of reasoning behind changes

Ordinance Outline (Major changes to ordinance are in blue)

761-1 Findings- This section was added to better justify the need for the ordinance and the ordinance revisions

761-2 Intent, Purpose, Policies, and Scope

A. Intent- Updated to emphasize water quality

B. Purpose-

C. Policies-Updated to incorporate Indiana Stormwater Quality Manual and BMPs

D. Scope

761-3 Waivers and Appeals of Waiver Decisions

761-4 Relationship to other ordinances, statutes, and regulations

761-5 Definitions- Updated to include definitions needed to understand ordinance updates (including those for all the mentioned BMPs)

Stormwater Quantity Requirements

761-6 Storm Water Detention Applicability and Release Rate Requirements-Updated to include BMPs

761-7 Capacity Requirements for Stormwater Drainage Systems- Updated to include BMPs

Stormwater Quality Requirements

761-8 Stormwater Pollution Prevention for Construction Sites- section added to ensure construction and post-construction stormwater quality are both addressed and refers to 816

761-9 Stormwater quality for Post-Construction

- Policy section added

- 80% TSS added

- BMP list with pollutant reduction added

- Updated throughout to improve emphasis on BMPs

- Inspection Maintenance Record Keeping and Reporting updated to include O&M Manual requirements and periodic self-inspections (using checklists in new appendix and a new appendix outlining the required sections for the operation and maintenance manual)

761-10 Miscellaneous Standards- erosion and sediment control to new 761-8 construction section

761-11 Submittal Requirements

- New checklist for submittal requirements added to appendix

- New requirement for hydraulic design calculations indicating adequate TSS removal

- Updated to emphasize BMP use, including requirements for submitting post-construction BMP information

761-12 As-Built Plans- updated so BMPs be included in As-Built Plans submitted (volume and TSS capture)

761-13 Pipe Inspections

761- 14 Critical Drainage Areas

761-15 Changes in Plans

761-16 Determination of Peak Discharges- move parts to appendix

761-17. Permits for Construction in (DNR and FEMA) Regulated Floodways

761-18. Easements- updated to include BMPs

761-19 Corrective Actions- Civil Penalties updated to reference MCC 115

761-20. Interpretation and Separability

761-21. Disclaimer of Liability

761-22. Appendices

- New Stormwater Quality Plan Checklist

- New Maintenance Checklists

- New Structural Water Quality Treatment calculations

Recommendations & Future Direction

7. Work with IDEM to update the Indiana Stormwater Quality Manual
8. Create a the “Green Infrastructure Incentive Program” to incentivize low impact development and stormwater BMP installation among developers. Other municipalities have employed the following incentive tools:
 - a. Permit Fee: Applicants participating within the Program can receive reimbursement for single-family residential and commercial development.
 - b. Fast Tracking: Projects participating in the Program shall be given priority over projects which are not Program projects during site plan review, submitted or resubmitted for review.
 - c. Stormwater Fee Credits: Applicants participating within the Program can receive credits based on the relative reduction of impervious for single-family residential and commercial development.
 - d. Awards & Public Recognition: Provide lawn signs/recognition on the website of properties that have employed exceptional stormwater/BMP measures.
 - e. Examples of existing stormwater incentive programs:
 - i. **Lake Champlain International (LCI) BLUE Certification for watershed-friendly homes:** Homeowners work with an evaluator on a checklist of behavioral and physical practices they should adopt to become BLUE-certified. Behavioral changes include using phosphorus-free detergent and disposing of pharmaceuticals properly, for example. Physical practices include runoff prevention features, such as redirected downspouts, rain gardens, and rain barrels. For features requiring installation, LCI provides funding to help offset the cost of the project. Once completed, an evaluator returns to ensure proper installation, then certifies the homeowner, who is required to sign a legally binding 3-year maintenance agreement. Homeowners also agree to an annual audit, and at 3 years, the home is evaluated for recertification. (<https://mychamplain.net/blue-certification-program>)
 - ii. **Philadelphia, Pennsylvania:** Projects with 95 percent or more of the impervious area disconnected from the combined or separate storm sewer can qualify for a fast track review process in which the stormwater management section of the project will be reviewed within five days of submittal. The City also provides an incentive grant program This option provides time and cost savings for the project and comes at low or no cost for the City. (<http://www.phila.gov/water/wu/stormwater/Pages/Grants.aspx>)

iii. **Chicago, Illinois:** A floor area premium is granted to developments that include public amenities such as green roofs by allowing an increase in the Floor to Area Ratio (FAR). The FAR is the relation of the total floor area of a building to the size of the land. This allows the developer to increase the amount of square footage that can be developed while mitigating urban heat island effect and reducing stormwater runoff. In order to qualify, at least 50 percent of the roof area or a minimum of 2,000 square feet must be covered with vegetation. (https://www.cityofchicago.org/city/en/depts/bldgs/provdrs/green_permit.html)

iv. **Portland, Oregon:** The Clean River Rewards Incentive and Discount (CRID) Program provides property owners with the opportunity to earn a discount on their monthly stormwater utility charge by treating stormwater runoff onsite. Discounts are available to property owners based on the extent and effectiveness of on-site stormwater management practices that control flow rate, pollution, and disposal. The CRID has a simplified discount program for residential properties based on roof runoff management, and a more complex commercial property program that requires management of runoff from all impervious areas. (<https://www.portlandoregon.gov/bes/41976>)

v. **Seattle, Washington:** The Density Bonus Incentive allows downtown commercial, residential, and mixed-use developments which gain LEED Silver or higher certification to build to a greater height and/or floor area than would normally be permitted. The Green Factor Program in Seattle was instituted in 2007, and requires 30 percent of a parcel in the Neighborhood Commercial Zone to be either vegetated or functionally equivalent to a vegetated area, as determined by completing a Green Factor Scorecard. The scoring system was created to promote the implementation of BMPs in areas visible to the public, such as along streets and sidewalks while offering developers and designers flexibility to meet development standards. Larger plants, permeable paving, vegetated walls, preservation of existing trees, and layering of vegetation are preferred measures, with bonuses provided for food cultivation, native and drought-tolerant plants, and rainwater harvesting. These aesthetically attractive elements will simultaneously improve air quality, create habitat for wildlife, and alleviate urban heat island effects. They also reduce stormwater runoff, protecting receiving waters and decreasing public infrastructure costs.

<http://www.seattle.gov/dpd/codesrules/changestocode/greenfactor/documents/default.htm>)

9. Upon the landowner's submission of their O&M manual, the drainage board should review the manual to confirm the ownership and put it on public record. Doing so will ensure the BMPs are maintained in perpetuity.
10. Conduct random inspections of properties with BMPs to ensure they are maintained per their Operation and Maintenance manual
11. Update stormwater quantity sections
 - a. ½ inch to 1 inch