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REPORT

April 1, 2017

TOWN OF

Thomaston

CONNECTICUT

Stormwater Management Plan

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1 INTRODUCTION / OVERVIEW

1.1 INTRODUCTION

This Stormwater Management Plan (SWMP) was developed by the Town of Thomaston (Town) for the purpose of establishing, implementing and enforcing a stormwater management program to reduce the discharge of pollutants from the town's highways, roadways, and facilities to the maximum extent practicable, to protect water quality, and to satisfy the appropriate requirements of the Clean Water Act (CWA).

The SWMP will cover all of the Town's highways, roadways and facilities within the Urbanized Areas (UA) as indicated by the 2010 Census. Individual facilities such as maintenance garages and other miscellaneous facilities are or will be covered under general permits (industrial) with the Connecticut Department of Energy & Environmental Protection (CTDEEP).

The U.S. Environmental Protection Agency (EPA) published the regulation entitled "National Pollutant Discharge Elimination System - Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges on December 8, 1999 as required by Section 402(p) of the CWA. This is commonly referred to as the National Pollution Discharge Elimination System (NPDES) Phase II program.

This SWMP also directly addresses the requirements of the NPDES Phase II program as implemented and administered by the CTDEEP as the regulatory authority for the State of Connecticut. The NPDES Phase II program is implemented by the CTDEEP through the use of the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4).

The Town currently follows practices and programs that address stormwater management and pollution prevention. This plan will coordinate and incorporate these programs, policies, guidelines and practices into the SWMP document by reference.

The plan outlines a program of best management practices (BMPs) and measurable goals for the following six minimum control measures.

- Public education and outreach
- Public involvement / participation
- Illicit discharge detection and elimination
- Construction site stormwater runoff control
- Post-construction stormwater management in new development or redevelopment
- Pollution prevention/good housekeeping

For each minimum control measure, the Department (see Appendix A) will define appropriate BMPs, designate a person(s) and job title responsible for each BMP, define a time frame for implementation for each BMP, and define measurable goals for each BMP.

1.2 TOWN STRUCTURE AND INFORMATION

The Town of Thomaston has a Selectman-Town Meeting form of government, which is the traditional governmental organization of New England towns. The legislative power of the Town is vested in a Board of Selectmen and the town meeting. The present-day duties of the selectmen include responsibility for town road building and maintenance, administration of the Town's social service program, and keeping the financial records for the Town.

Several commissions within the Town have jurisdiction over development and include the following:

- Conservation Commission
- Inland Wetlands and Watercourses Commission
- Planning & Zoning Commission

The Highway Department is responsible for all the property that the taxpayers of the Town of Thomaston own. This includes, but is not limited to, all buildings, roads, parking lots, roadsides and parks.

The Town has extensive stormwater management systems that are cleaned on an annual basis.

The Town Garage facility operates and is registered under the General Permit for the Discharge of Stormwater Associated with Industrial Activities. The application permit number for this facility is 200402194.

1.3 SWMP DEVELOPMENT TEAM

As part of the development of the SWMP, a project team was established with representatives of the Town and the Town's consultant for this assignment, Weston & Sampson.
During the development of the plan, the project team met to discuss relevant issues and provide input and guidance in the development of the plan. A list of the project team is provided below.

Table 1.1 SWMP DEVELOPMENT TEAM

Name	Organization & Title
Edmond V. Mone	Town of Thomaston First Selectmen
Glenn Clark	Town of Thomaston Superintendent of Highways
Jeremy Leifert	Town of Thomaston Land Use Administrator
Chris Wester, P.E.	Weston & Sampson Vice President
Raju Vasamsetti, P.E.	Weston & Sampson Project Manager

1.4 TOWN INFORMATION

The Town covers an area of approximately 12.2 square miles and is home to approximately 7,887 residents according to the 2010 Census. Approximately 0.2 square miles of the Town is comprised of waterbodies and watercourses.

Sub regional drainage basins and major watercourses include the Naugatuck River, Leadmine Brook, Northfield Brook and Branch Brook. These are part of the Naugatuck River major drainage basin. In addition, there are several significant lakes and ponds within the town including Wigmaw Reservoir, Nystrom Pond and Morton Pond.

Approximately 9.1 square miles of the Town is considered to be Urbanized Area (UA) according to the 2010 Census.

Maps of the Town location, drainage features, and Urbanized Areas can be found in Appendix B.

2 MINIMUM CONTROL MEASURES

2.1 INTRODUCTION

Six minimum control measures are required to be included in the SWMP, to satisfy the requirements of the NPDES Phase II program and CTDEEP's General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4s). Specific best management practices (BMPs) for each minimum control measure must be selected and incorporated into the plan, and implemented as part of the Department's stormwater management plan (SWMP).

This SWMP outlines a plan of BMPs and measurable goals for each of the six minimum control measures:

1. Public Education and Outreach
2. Public Involvement / Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff Control
5. Post-Construction Stormwater Management
6. Pollution Prevention / Good Housekeeping

The plan requires that a combination of tasks be undertaken to carry out the BMPs selected for each measure. This includes documentation of ordinances, policies, procedures and training, development of specific programs and products, conducting public information meetings, development of a storm sewer system map, outfall testing, development of new training and additional maintenance requirements.

The BMPs selected for each minimum control measure are summarized and briefly described in this section. Specific details for each BMP including measurable goals, implementation dates and positions responsible are stated in each of the respective sections for each control measure in this plan. The First Selectmen and Superintendent of Roads will be responsible for implementation and future enforcement of each of the BMPs for the six minimum control measures.

2.2 PERMIT REQUIREMENTS AND IMPLEMENTATION DATES

The previous General Permit for the Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (“General Permit”) and Stormwater Management Plan (SWMP) were submitted to the CTDEEP in 2005. The stormwater management program has been implemented. Annual reports have been submitted to the CTDEEP (See Appendix D). These reports include information such as stormwater outfall testing, implementation and adequacy of selected BMPs and status of measurable goals.

The General Permit issued January 20, 2016 requires that the Permit Application Form be submitted 90 days prior to July 1, 2017. The Stormwater Management Report must be available for public review and comment by April 1, 2017, at least 90 days before July 1, 2017 (the effective date of the General Permit).

2.3 PUBLIC EDUCATION AND OUTREACH

Regulatory Requirement:

Under the General Permit Section 6(a)(1), the permittee is required to "implement a public education program to distribute educational materials to the permittee's community or conduct equivalent outreach activities about the sources and impacts of stormwater discharges on waterbodies and the steps that the public can take to reduce pollutants in stormwater runoff."

Existing Town Practices:

The Town addressed Public Education and Outreach through the following BMPs:

- Brochures / Fact Sheets
- Town Web Site
- Library of Educational Materials
- Storm Drain Marking / Stenciling
- Tributary Signage

Informational materials including brochures and fact sheets are available at the Town Hall in the First Selectmen's Office and the Land Use Office. The educational materials are also displayed at Inland Wetlands and Watercourses Commission Meetings.

Storm drain marking and stenciling products were obtained from the CTDEEP and installed in phases throughout Town. Over 250 catch basins have been marked.

A tributary signage program was developed and a number of signs were installed to unnamed tributaries that discharge into Branch Brook and into the Naugatuck River.

2.4 PUBLIC INVOLVEMENT / PARTICIPATION

Regulatory Requirement:

Under the General Permit Section 6(a)(2), the permittee is required to "provide opportunities to engage their community to participate in the review and implementation of the permittee's Plan." Public participation benefits the program by increasing public support, including additional expertise and involving community groups/ organizations.

Existing Town Practices:

The following BMPs have been followed to address the Public Participation / Involvement minimum control measure:

- Public Review and Comment
- Brochures at Town Hall and Public Meetings
- Storm Drain Marking/Stenciling

A public review and comment period was utilized to solicit comments from the public and to encourage participation in the development of the SWMP.

Through the display of educational brochures at the Town Hall and at public meetings, the public was educated on stormwater quality.

The storm drain marking and stenciling program incorporated public and community involvement by having groups install these materials. The participants learned about stormwater quality through their participation and involvement.

2.5 ILLICIT DISCHARGE DETECTION AND ELIMINATION

Regulatory Requirement:

Under the General Permit Section 6(a)(3), the permittee is required to develop a written Illicit Discharge Detection and Elimination (IDDE) program. The IDDE program is designed to "provide the legal authority to prohibit and eliminate illicit discharges to the MS4; find the source of any illicit discharges; eliminate those illicit discharges; and ensure ongoing screening and tracking to prevent and/ or eliminate future illicit discharges."

Existing Town Practices:

The following BMPs were selected to address the Illicit Discharge Detection and Elimination minimum control measure:

- Ordinance Regarding Non-Stormwater Discharges
- Storm Sewer System Map
- Illicit Discharge Detection and Elimination Program
- Future Illicit Discharge Detection and Elimination

The Town does not allow non-stormwater discharges into its MS4. The town ordinances were reviewed, and it was determined that the existing ordinances meet the requirements of the General Permit.

A storm sewer system map was developed in order to identify and locate Department outfalls greater than or equal to 12" in diameter within urbanized areas and 15" throughout the town. The outfalls were located through Global Positioning System (GPS) surveying techniques. The mapping was accomplished through the use of Geographical Information System (GIS) computer software. The current storm sewer system map can be seen in Appendix B.

The IDDE program includes testing six (6) different outfalls each year. At least two (2) outfalls apiece were monitored from areas of primarily industrial development, commercial development and residential development, respectively, for a total of six (6) outfalls monitored. Each monitored outfall was selected based on an evaluation by the Town that the drainage area of such outfall is representative of the overall nature of its respective land use type. Between 2008 and 2016, two samples were taken from the Naugatuck River.

The Town has continued to monitor its stormwater discharges in an effort to detect and address future non-stormwater discharges and will coordinate with other municipalities and state agencies in identifying illegal dumping.

2.6 CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

Regulatory Requirement:

Under the General Permit Section 6(a)(4), the permittee shall "implement and enforce a program to control stormwater discharges (to its MS4) associated with land disturbance or development (including re-development) activities from sites with one acre or more of soil disturbance, whether considered individually or collectively as part of a larger plan." The program will be consistent with "the 2002 Guidelines for Soil Erosion and Sedimentation Control, as amended, the Connecticut Stormwater Quality Manual, and stormwater discharge permits issued by DEEP within the municipal or institutional boundary pursuant to CGS 22a-430 and 22a-430b." The permittee will conduct site plan reviews, site inspections and include procedures for public involvement.

Existing Town Practices:

The following BMPs were selected to address the Construction Site Runoff Control minimum control measure:

- Ordinance Requiring Erosion and Sediment Controls
- Procedures for Notifying Construction Site Developers and Operators of Requirements for Registration
- Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control Best Management Practices
- Requirements for Construction Site Operators to Control Waste at the Site
- Procedures for Site Plan Review
- Procedures for Receipt and Consideration of Information Submitted by the Public
- Procedures for Site Inspection and Enforcement of Control Measures

The Town requires erosion and sediment controls for all projects in accordance with all State and Federal regulations. Several documents define the Town regulations for requiring erosion and sediment controls associated with construction activities within the Town. These regulations include the following:

- Zoning Regulations
- Subdivision Regulations
- Inland Wetlands and Watercourse Regulations

To satisfy the requirements of the General Permit for implementing appropriate best management practices, the Town's regulations were modified to be in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control. The Guidelines contain practices for the planning, design and construction of erosion and sediment controls.

The Town's Zoning Regulations, Subdivision Regulations and Inland Wetland and Watercourse Regulations will be modified to include procedures for notifying construction site developers and operators of the requirements for registration under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities.

Zoning Regulations and Subdivision Regulations will be modified to incorporate requirements for construction site operators to control waste at the site.

Procedures for site plan review which incorporate consideration of potential water quality impacts are required by the Town in their Zoning Regulations and Subdivision Regulations.

The Town utilizes their government structure for processing information submitted by the public for receipt and consideration. Information submitted by the public is forwarded to the appropriate Department within the Town's government structure for consideration.

Site inspection and enforcement of control measures are required by the Town in their Zoning Regulations, Subdivision Regulations and Inland Wetland and Watercourse Regulations.

2.7 POST-CONSTRUCTION STORMWATER MANAGEMENT

Regulatory Requirement:

Under the General Permit Section 6(a)(5), the permittee shall require developers to "consider the use of low impact development (LID) and runoff reduction site planning and development practices prior to the consideration of other practices in the permittee's land use regulations, guidance or construction project requirements to meet or exceed those LID and runoff reduction practices identified in the Stormwater Quality Manual."

"Such legal authority shall include the following standards:

1. for redevelopment of sites that are currently developed with Directly Connected Impervious Area (DCIA) of forty percent or more, retain on-site half the water quality volume, or

2. for new development and redevelopment sites with less than forty percent DCIA, retain the water quality volume for the site, or

3. an alternative retention/ treatment standard as outlined in 6(a)(5)(B)(i)-(ii)"

Existing Town Practices:

This minimum control measure outlines a program that addresses stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development, that discharge into small MS4s.

The following BMPs were selected to address the Post-Construction Site Runoff Control minimum control measure:

- Requirements for Structural and Non-Structural BMPs
- Procedures for Addressing Post-Construction Runoff from Construction and Reconstruction Projects
- Ensuring Long-Term Operation and Maintenance of Rest Management Practices

The Town requires structural and structural BMPs for projects disturbing greater than or equal to one-half (1/2) acre.

The Town's current Subdivision Regulations, Zoning Regulations and Inland Wetlands and Watercourse Regulations will be modified to incorporate guidelines and procedures that address post-construction runoff throughout planning, designing and construction phases of all construction and reconstruction projects within the Town. These modifications will satisfy requirements of the General Permit and were made in accordance with the following documents:

- CTDOT Drainage Manual, October 2000 and supplements thereto
- Connecticut Guidelines for Soil Erosion and Sediment Control, DEEP Bulletin 34, 2002 and supplements thereto
- Connecticut Stormwater Quality Manual, 2004 and supplements thereto Post-construction runoff from construction and reconstruction projects will be regulated by the Town's Subdivision Regulations, Zoning Regulations, and Inland Wetland and Watercourse Regulations.

The town has ensured its long-term operation and maintenance of post-construction BMPs through regularly scheduled maintenance as required by the general permit. Long-term operation and maintenance of best management practices was in accordance with Section 6 — Good Housekeeping / Pollution Prevention of the previous plan.

The Zoning Regulations, Subdivision Regulations and Inland Wetlands and Watercourses regulations will be modified to include Low-Impact Development (LID) standards.

2.8 POLLUTION PREVENTION / GOOD HOUSEKEEPING

Regulatory Requirement:

Under the General Permit Section 6(a)(6), the permittee shall “implement an operations and maintenance program for permittee-owned or –operated MS4s that has a goal of preventing or reducing pollutant runoff and protecting water quality from all permittee–owned or –operated MS4s.”

This minimum control measure includes a training component and has the ultimate goal of preventing or reducing stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance.

Existing Town Practices:

The following BMPs were selected to address the Pollution Prevention / Good Housekeeping minimum control measure:

- Operation and Maintenance Program
- Employee Training Program
- Street Sweeping Program
- Catch Basin Maintenance Program
- Preventative Maintenance Program

These BMPs required the continuation of the Town's operation and maintenance program. Operation and maintenance is an integral component of all stormwater management programs. This measure improved the efficiency of the individual programs through appropriate maintenance practices, internal procedures and scheduling. The Town included employee training, record keeping and internal reporting in the development and implementation of their program.

Training has continued to provide proper operation and maintenance of the Town's facilities and roadways. The Town will modify their employee training program to include education and training to its employees regarding stormwater management, and how it relates to the Town's maintenance operations. The training will focus on pollution prevention, best management practices and good housekeeping.

The Town's procedures for record keeping will incorporate the required documentation of information and data, resulting from the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems procedures. Keeping records of spills, leaks, inspections, scheduled maintenance and other stormwater related issues, provides useful information for ensuring proper operation of facilities and equipment with the ultimate goal of improving best management practices and water quality.

Significant spills are handled by the Thomaston Fire Department. CTDEEP is notified of all spill situations as they occur, and CTDEEP is prepared to respond to hazardous spills within the Town. The DPW facility maintains spill containment supplies including Speedi-Dry, absorbent pads, and containment booms.

The Town's internal reporting procedures incorporated the additional effort needed with this stormwater management program, and the position(s) responsible for each stormwater management task.

The Town sweeps all of its roadways, parking lots and facilities at least once per year. The sweeping was performed as soon as possible after snowmelt. In years 1-3 of the program, priority areas were swept multiple times. In year 4 of the permit (2007), the sand/salt mixture was replaced with an all salt mixture, which reduced the amount of sediment on the road. Since then all roads have been swept once per year.

The Town continued their catch basin maintenance program and modified it to meet the requirements of the General Permit. This consisted of inspecting and if necessary cleaning catch basins on a regularly scheduled basis. The town used the following criteria for inspecting and cleaning their catch basins:

- The Town has annually evaluated and, if necessary, cleaned catch basins and other stormwater structures that accumulate sediment at least once a year. Typically, all catch basins in Town are cleaned in the spring and fall each year to prevent having to clean subsurface storm sewer pipe segments between structures.

- Priority areas were established to maximize the effectiveness of the town's available resources for the routine inspections. These priority areas were developed using the Town's knowledge of problem areas, where sediment/debris had been known to accumulate in higher quantities.

Since 2007, the amount of sediment in catch basins was reduced due to the all salt-based product. This has reduced the number of catch basins that are cleaned per year.

Preventative maintenance will continue to be utilized by the Town for eliminating potential problems associated with drainage systems, facilities and equipment. The measures generally utilized by the Town are performed during the following activities:

- Catch basin inspection during routine maintenance
- Drainage system inspection for new construction / reconstruction projects.

Preventative maintenance is also required by public agencies and private developers disturbing or effecting Town storm sewer systems through new development or modifications to adjacent existing developments. These entities are required to conduct an "Existing Drainage Facility Conditions Survey" for the portion of the Town's drainage system(s) that they will be tying into or affecting as a result of the modifications. The guidelines for this survey are summarized below, and are provided in greater detailed in the Connecticut Department of Transportation's (CTDOT's) "Drainage Manual", Section 3.6.3 and Appendices 4.A & B.

- Culvert inspection shall be conducted for existing Town culverts to remain in use, as part of a project. Culvert inspection shall follow the guidelines as outlined in the CTDOT's "Drainage Manual 2000", Appendix 4.A.
- Existing Town drainage facilities including pipes, catch basins, manholes, junction chambers, sedimentation/gross particle separators, cross culverts and ditches/swales, which are scheduled to remain in use as part of a project, were inspected to verify their general condition early in the design process. A condition survey must be conducted for drainage systems which have been in service for 10 years or more. Available previous condition reports were reviewed prior to inspection to identify critical areas that may require special attention. The drainage facility inspection shall follow the guidelines as outlined in the CTDOT's "Drainage Manual 2000", Appendix 4.B.
- The designer should also consult with the Town for past problems, site conditions and proposed future improvements

3 PUBLIC EDUCATION AND OUTREACH

3.1 REQUIREMENTS

Implementation of a public education program is required to distribute educational materials to the public or conduct equivalent outreach activities regarding the impacts of stormwater discharges on waterbodies and the steps that the public can take to reduce pollutants in stormwater runoff. The educational program will focus on information on management of pet waste, application of fertilizers, herbicides and pesticides, impervious cover and impacts of illicit discharges and improper disposal of waste into the municipal separate storm sewer system.

Appropriate BMPs and measurable goals for this minimum control measure are described below.

3.2 BEST MANAGEMENT PRACTICES

The following BMPs will be utilized in the implementation of the program to address the minimum control measure for Public Education and Outreach.

3.2.1 Brochures / Fact Sheets

Brochures / fact sheets from the United States Environmental Protection Agency (EPA) and CTDEEP have been displayed in First Selectmen's Office and Land Use Office. The stormwater fact sheets have also been displayed at public information meetings and hearings for Inland Wetlands Meetings.

The brochure will be updated to include more information about management of pet waste, application of fertilizers, herbicides and pesticides, impervious cover and impacts of illicit discharges and improper disposal of waste into the municipal separate storm sewer system.

The benefits associated with this BMP include reaching a diverse audience within the Town of Thomaston.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 3.1 Brochure/ Fact Sheet BMP
Measurable Goals and Implementation Dates

Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1	Update brochures/ fact sheets. Continue to display in Town Hall and at Inland Wetland and Watercourses Commission Meetings.	Land Use Administrator Webmaster
Year 2-5	Continue to distribute brochures/ fact sheets.	Land Use Administrator Webmaster

3.2.2 Town Web Site

The Town currently maintains a web site at http://www.thomastonct.org/. Links to the Stormwater Management Plan and Stormwater Annual Reports are posted on the website.

Links to additional web sites including CTDEEP, EPA and other stormwater resources and other related information will be added to the Town' s web site. The information listed on the web site will address the effects of stormwater quality on the environment. The Town's web site is available to the public by means of internet access. The updated SWMP, links and additional information will be posted on the website during the first year of the program.

The web site will include the following links at a minimum:

- https://www.epa.gov/npdes/npdes-stormwater-program
- http://www.ct.gov/deep/municipalstormwater
- https://www.riversmartct.org/
- http://www.cwp.org/

The benefits associated with this BMP include creating awareness and making information available to a very large, diverse audience. A website will take advantage of current technology reaching an audience using internet access.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 3.2 Town Web Site BMP
Measurable Goals and Implementation Dates

Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1	Post updated SWMP, links and additional information to website	Superintendent of Highways, Webmaster
Year 2-5	Update website as required	Superintendent of Highways, Webmaster

3.2.3 Library of Educational Materials

A library of educational materials has been developed and is maintained at the Town Hall. The library consists of data, information, fact sheets and guidelines pertaining to stormwater management. The library is available to the Town's employees and available to the public on request.

The materials and resources will be updated during the first year. The material will include information about the pollutants associated with the stormwater discharges. Bacteria is a stormwater pollutant of concern in the Naugatuck River within the Town according to the Connecticut Integrated Water Quality Report.

Educational materials regarding the source of bacteria should include practices to reduce pollution from the following:

- Septic systems
- Sanitary cross connections
- Waterfowl
- Pet waste
- Manure piles associated with livestock and horses

The benefits associated with this BMP include establishing a library within the Town for data and information relating to stormwater management and quality, accessible to Town employees and the public for reference.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 3.3 Library of Educational Materials BMP
Measurable Goals and Implementation Dates

Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1	Update data and information.	Superintendent of Highways, Land Use Administrator
Year 2-5	Maintain library	Superintendent of Highways Land Use Administrator

4 PUBLIC INVOLVEMENT / PARTICIPATION

4.1 REQUIREMENTS

Compliance with applicable State and local public notice and Freedom of Information regulations are required when implementing a public involvement/participation program. Where notice requirements are inconsistent, the notice provisions providing for the most notice and opportunity for public comment shall be followed.

The development of a public involvement/participation program that includes the public in developing, implementing, and reviewing the stormwater management program is required.

Appropriate BMPs and measurable goals for this minimum control measure are detailed below.

4.2 BEST MANAGEMENT PRACTICES

The following BMPs will be utilized in the implementation of the program to address the minimum control measure for Public Participation and Involvement.

4.2.1 Public Review and Comment — Stormwater Management Plan

The Stormwater Management Report and Annual Reports are available to the public for review and comment via the Town website. The updated Stormwater Management Report will be posted on the Town website.

The public can send comments to the First Selectman's Office at email address: emone@thomastonct.org

The First Selectman can distribute public comments to the Superintendent of Highways or Land Use Administrator as appropriate.

Copies of these documents will be also made available at the Town Hall and Public Library for public inspection and copying consistent with the Federal and State Freedom of Information Acts.

Reasonable efforts to inform the public of this document will be made by the Town and may include Public Notice in local newspapers and posting of notices at public places. The Public Notice shall allow for a 30-day comment period. The Town will publish the Public Notice annually by January 31.

4.2.2 Brochures at Town Hall and Public Meetings

Brochures addressing the effects of stormwater quality on the environment are available to the public at Town Hall and at meetings, public hearings and public informational meetings through the Conservation Commission, Inland Wetlands and Watercourses Commission, and Planning and Zoning Commission.

The brochure will be updated/modified by the end of the first year of the program, and distribution at the public meetings will continue.

The benefits associated with this BMP include reaching a diverse audience. Meetings, public hearings / information meetings are conducted by the town commissions on a continuous basis. This will allow the public the opportunity to comment and participate in the development of stormwater management plans for specific projects during the design development process.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 4.1 Brochure/ Fact Sheet at Town Hall and Public Meetings BMP
Measurable Goals and Implementation Dates

Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1	Update brochures/ fact sheet. Continue to display in Town Hall and at Inland Wetlands Meetings.	Land Use Administrator, Webmaster
Year 2-5	Continue to distribute brochures/ fact sheets.	Land Use Administrator, Webmaster

4.2.3 Storm Drain Marking/Stenciling

This CTDEEP catch basin marking program will continue to be a community program. The benefits associated with this BMP include increased public participation in local stormwater management programs and increased awareness by the general public. The program educates and demonstrates to the public the direct link between the storm sewer system and the surface waters to which it drains. The program marks fifty (50) catch basins per year.

Table 4.2 Storm Drain Marking/ Stenciling BMP
Measurable Goals and Implementation Dates

Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Install storm drain markers/ stencils	Superintendent of Highways

5 ILLICIT DISHCARGE DETECTION AND ELIMINATION

This minimum control measure will identify and reduce untreated discharges that contribute high levels of pollutants, including heavy metals, toxic materials, oil and grease, solvents, nutrients, viruses and bacteria to receiving waterbodies. Pollutant levels from these illicit discharges have been shown to be high enough to significantly degrade receiving water quality and threaten aquatic, wildlife, and human health.

5.1 REQUIREMENTS

5.1.1 Within one year of the effective date of the general permit, the permittee shall develop a written IDDE program. The IDDE program shall be implemented in accordance with Appendix B of the General Permit.

5.1.2 Within one year of the effective date of the General Permit, the permittee shall establish the necessary and enforceable legal authority to eliminate illegal discharges.

5.1.3 By the end of the second year of the General Permit, the development of a map or series of maps must be completed. The maps will show all stormwater discharges from pipes or conduits owned or operated by the Department in urbanized and priority areas.

Appropriate BMPs and measurable goals for this minimum control measure are detailed below.

5.2 BEST MANAGEMENT PRACTICES

The following BMPs will be utilized in the implementation of the program to address the minimum control measure for Illicit Discharge Detection and Elimination.

5.2.1 Town Ordinance Regarding Non-Stormwater Discharges

The Town does not allow non-stormwater discharges into storm sewer systems owned and maintained by the Town. The Town ordinances will be reviewed to determine if an existing ordinance is in place. If there is not an existing ordinance prohibiting non-stormwater discharge, a new ordinance will be developed and implemented. If an existing ordinance is in place, it will be reviewed and if necessary updated to conform to the requirements of the General Permit.

Upon identifying a non-stormwater discharge, the source of the discharge shall be determined and if found to be beyond or outside the Town's system, the owner will be notified by the Town Attorney of the violation. If the non-stormwater discharge is from a Town facility, the source location shall be confirmed and corrective actions taken to eliminate the non-stormwater discharge. The Town will continue to prohibit these discharges and will use all available resources for its enforcement.

Table 5.1 Town Ordinance Regarding Non-Stormwater Discharges BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1	Write and implement a Town Ordinance regarding non-stormwater discharges.	Superintendent of Highways
Year 2-5	Continue to implement the Town Ordinance.	Superintendent of Highways

5.2.2 Storm Sewer System Map(s)

The storm sewer system map(s) will be updated. The maps will show the location of all outfalls in urbanized areas and priority areas. The maps will also contain the names and locations of all waters of the Town that receive discharges from those outfalls. The map will include, but not be limited to, town owned facilities including roadways and parking lots. The map(s) scale will be a minimum of 1"=2000' and a maximum of 1"=100' and will include the following information at a minimum:

Field surveys will be performed by the Town using GPS, to verify existing outfall locations and locate outfalls that are missing from the existing map.

The Town will update the existing database. The database utilizes a GIS to build and query the information, which will be accessible to all offices of the Department. The database will include but not limited to the following information associated with outfalls:

a. Type, material, size and location (identified with a latitude and longitude) of conveyance, outfall or channelized flow (e.g. 24" concrete pipe);

b. The name, water body ID and Surface Water Quality Classification of the immediate surface waterbody (if available) or wetland to which the stormwater runoff discharges;

c. If the outfall does not discharge directly to a named waterbody, the name of the nearest named waterbody to which the outfall eventually discharges;

d. The name of the watershed, including the sub regional drainage basin number in which the discharge is located;

e. The spreadsheet or database should, if possible be prepared in a format compatible with Microsoft Excel.

The storm sewer map is a component of the program that will require continuous maintenance after its initial development. The Town will periodically update the map with the latest storm sewer system configurations and information in the future.

The benefits associated with this BMP include providing awareness of the intake and discharge areas of the Department's systems. This information will be helpful in determining the extent of dry weather flows, potential sources and the particular waterbodies that these flows may be affecting. The map will also be useful in identifying the responsible parties associated with specific illicit discharges.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 5.2 Storm Sewer Map BMP
Measurable Goals and Implementation Dates

Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-2	Perform field survey with GPS to survey outfalls. Update database and map (GIS).	Superintendent of Highways Webmaster
Year 3-5	Modify and maintain database and map (GIS).	Superintendent of Highways Webmaster

5.2.3 Illicit Discharge Detection and Elimination Program

A new IDDE program will be developed and implemented to systematically (to the maximum extent practicable) find and eliminate non-stormwater discharges into the Department's storm sewer systems. During the development of the IDDE program, the previous IDDE program required by the 2004 General Permit will be followed.

The IDDE program will utilize sampling/ monitoring techniques (section 9), personnel and equipment, along with the storm sewer map (Section 5.2.2) for locating sources of illicit discharge and sanitary sewer overflows (SSOs).

In instances, where the storm sewer systems are interconnected between different owners, the Town and the other entity would be co-permittees. This could include CTDOT or adjacent towns. The Town would be responsible for its system up to the tie in or connection point, while the other party would be responsible from the connection point upstream. If an illicit discharge is identified within a Town-owned system, the Town will be responsible for determining whether the sources origin is located within its system. If the illicit discharge is determined to be from a point beyond the Town's system, the Town Attorney will be notified for further action.

The Town Garage is currently regulated under the General Permit for the Discharge of Stormwater Associated with Industrial Activity. This Town Facility will remain under that permit, and therefore is subject to the requirements of this permit or covered under this stormwater management program.

Table 5.3 Illicit Discharge and Elimination Program BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1	Write IDDE Program.	Superintendent of Highways
Year 2-5	Implement IDDE Program.	Superintendent of Highways

5.2.4 Citizen Reporting Program

A citizen reporting program will be established as part of the IDDE program. Citizens will be able to report an illicit discharge via an email address or phone number.

The illicit discharge report will include the following information:

- Time
- Location of observed discharge

Table 5.4 Citizen Reporting Program BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Incorporate Citizen Reporting Program in IDDE. Include results in Annual Report	Superintendent of Highways

5.2.5 Record System for IDDE Tracking

Documentation, including annual reports, will be performed, and will include information such as: the number of outfalls tested, complaints received and addressed, and the number of illicit discharges and quantities of flow eliminated. Refer to Section 10 for specific details regarding annual reports to CTDEEP.

The benefits associated with this BMP include the identification and elimination of point sources of pollutant discharges and establishing a working database of information that will be useful in locating problematic areas.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 5.5 Record System BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Document IDDE findings in Annual Reports	Superintendent of Highways

5.2.6 Address IDDE in Areas of Pollutants of Concern

The Town will focus on monitoring outfalls that discharge to impaired streams. See Section 9 for monitoring requirements. The IDDE program shall prioritize areas with the highest potential to discharge bacteria, phosphorous and nitrogen to the MS4. Areas will be identified based on the following criteria:

- historic on-site sanitary system failures
- proximity to bacteria impaired waters
- low infiltrative soils
- shallow groundwater

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 5.6 Address IDDE in Areas of Pollutants of Concern BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	IDDE Program prioritizes areas with pollutants of concern	Superintendent of Highways

6 CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

This minimum control measure addresses polluted stormwater runoff from construction sites that discharges into local rivers and streams. Sediment is typically the main pollutant of concern but other pollutants include solid and sanitary wastes, phosphorous (fertilizer), pesticides, nitrogen (fertilizer), oil and grease, concrete truck washout, construction chemicals and construction debris.

Sediment runoff rates from construction sites are typically greater than those of agricultural lands, and significantly greater than those of forest lands. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. The resulting siltation, and the contribution of other pollutants from construction sites can cause physical, chemical, and biological harm to the state's waters.

6.1 REQUIREMENTS

The development, implementation and enforcement of a program, or modification of an existing program, is required to reduce pollutants in any stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one (1) acre. Reduction of stormwater discharges from construction activity disturbing less than one acre shall be included in the program if that construction activity is part of a larger common plan of development that would disturb one acre or more. The program shall include but not be limited to the following requirements:

6.1.1 An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions for non-compliance, to the extent allowable under State or local law.

6.1.2 Procedures for site plan review, which incorporate interdepartmental coordination.

6.1.3 Procedures for site plan review, which incorporate consideration of potential water quality impacts.

6.1.4 Procedures for site inspection and enforcement of control measures.

6.1.5 Procedures for receipt and consideration of information submitted by the public.

6.1.6 Procedures for notifying construction site developers and operators of the requirements for registration under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities.

Appropriate BMPs and measure goals for this minimum control measure are detailed below.

6.2 BEST MANAGEMENT PRACTICES

The following BMPs will be utilized in the implementation of the program to address the minimum control measure for Construction Site Runoff Control.

6.2.1 Regulations-Requiring Erosion and Sediment Controls

The Town requires erosion and sediment controls for all projects in accordance with all State and Federal regulations. Several documents define the town regulations for requiring erosion and sediment controls associated with construction activities within the Town. These regulations include the following:

- Zoning Regulations
- Subdivision Regulations
- Inland Wetlands and Watercourse Regulations

Zoning Regulations
Article X, 10.3.d & 10.7.e — These regulations require the applicant to submit an erosion and sediment control plan with a narrative describing the project, schedule of construction, grading, conservation practices and maintenance programs. Requirements for plan preparation are also described in these requirements.

Subdivision Regulations
Article III, 3.3.i, Article VIII, 8 — These regulations require the applicant to submit an erosion and sediment control plan with a narrative describing the project, schedule of construction, grading, conservation practices and maintenance programs. Requirements for plan preparation are also described in these requirements.

Inland Wetland and Watercourse Regulations
Section 7.6.b — These regulations require the applicant to submit an erosion and sediment control plan. To satisfy the requirements of the general permit for implementing appropriate best management practices, the Town's regulations will be modified to be in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control, for the planning, design and construction of erosion and sediment controls and best management practices. In addition, the town regulations will incorporate the Connecticut Department of Transportation Drainage Manual 2000 for the design of these controls, as they pertain to drainage design. These documents are listed more specifically as the following:

- CTDOT Drainage Manual, October 2000 and supplements thereto
- Connecticut Guidelines for Soil Erosion and Sediment Control, DEEP Bulletin 34, 2002 and supplements thereto

CTDOT Drainage Manual
Erosion and sediment control is addressed in Chapter 8.5.4 of the CTDOT Drainage Manual. The design of outlet protection for all projects shall be in accordance with the Drainage Manual. Outlet protection is discussed and the procedures for designing outlet protection

are contained in chapter 11.13 of the Drainage Manual. The methodology outlined in the Drainage Manual has been accepted by the CTDEEP

Connecticut Guidelines for Soil Erosion and Sediment Control

This document is intended to provide information to government agencies, municipal planning and zoning commissions and the public on soil erosion and sediment control for projects that require erosion and sediment control planning, design and implementation. The guidelines contain information / procedures for the design of several BMP's for stabilization construction sites, structures, drainage ways and watercourses, detention structures and energy dissipaters.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 6.1 Ordinance Requiring Erosion and Sediment Controls BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-2	Review and revise current town land use regulations to include reference to specific documents for design of Erosion and Sedimentation Control BMPs	Superintendent of Highways Inland Wetlands Commission
Year 3-5	Continue implementing regulations	Superintendent of Highways Inland Wetlands Commission

6.2.2 Interdepartmental Coordination in Site Plan Review

Site plans shall be submitted to the Zoning Commission. The Commission shall approve or deny the site plan within sixty-five (65) days after it has been received at a regular meeting.

Construction plans and specifications are required as part of the application to be submitted to the Town for review. Submitted applications are reviewed Town staff, commissions or consulting professional engineers for conformance to all of their regulations

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 6.2 Interdepartmental Coordination in Site Plan Review BMP BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Continue Site Plan Review Procedures	Land Use Administrator

6.2.3 Procedures for Site Plan Review

Procedures for site plan review which incorporate consideration of potential water quality impacts are required by the Town in the Zoning Regulations, Subdivision Regulations and Inland Wetlands and Watercourses Regulations. Construction plans and specifications are required as part of the application to be submitted to the Town for review. Submitted applications are reviewed by the Town for conformance to all of their regulations and requirements, and federal and state permit requirements relating to construction site runoff control. The requirements are more specifically defined in the following:

Zoning Regulations
Article 17, Site Plan Review

Subdivision Regulations
Article 3, Application Requirements and Procedures

Projects over five acres in size require registration under the General Permit for the Discharge of Stormwater Associated with Construction Activities. These projects shall include site plans along with the permit application and a site-specific stormwater pollution control plan for review and registration by the CTDEEP.

Inland Wetlands and Watercourse Regulations
Section 10.2, Criteria for Decision

Table 6.3 Procedures for Site Plan Review BMP
BMP Measurable Goals and Implementation Dates

Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Continue Site Plan Review Procedures	Planning & Zoning Commission. Inland Wetlands and Watercourse Commission

6.2.4 Procedures for Site Inspection and Enforcement of Control Measures

Site inspection and enforcement of control measures are required by the Town in the Zoning Regulations, Subdivision Regulations and Inland Wetland and Watercourse Regulations.

Zoning Regulations
Article 14, Administration and Enforcement
Article 18, 18.12, Site Inspection
Article 22, Sedimentation and Erosion Control Bond

Subdivision Regulations
Article 3, 3.5, Inspection by the Town Engineer
Article 14, Administrative Procedures

Inland Wetlands and Watercourse Regulations
Sections 14.2 and 14.5, Enforcement

Inspectors employed by the Town are authorized to inspect all work performed and materials furnished for each project. The inspection may extend to all or any part of the work, and to the preparation or manufacture of the materials to be used including work and materials relating to construction site runoff control. Sediment and erosion control measures, as shown on the record plans, will be inspected to determine of the facilities are properly constructed, functioning and maintained.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 6.4 Procedures for Site Inspection and Enforcement of Control Measures BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Continue Site Inspection and Enforcement of Control Measures	Land Use Administrator

6.2.5 Procedures for Receipt and Consideration of Information Submitted by the Public

The Town utilizes their government structure for processing information submitted by the public for receipt and consideration. Information submitted by the public is forwarded to the appropriate Department within the Town's government structure for consideration.

Table 6.5 Procedures for Receipt and Consideration of Information Submitted by the Public BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Continue Procedures for Receipt and Consideration of Information Submitted by the Public.	First Selectman, Land Use Administrator

6.2.6 Procedures for Notifying Construction Site Developers and Operators of Requirements for Registration

All projects with land disturbance of greater than or equal to five (5) acres associated with construction activities shall be registered under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities with the CTDEEP. Registration shall be submitted a minimum of sixty (60) days before the initiation of construction activities as required by the general permit.

For construction projects with a total disturbed area (regardless of phasing) of between one and five acres, the permittee shall agree to adhere to the erosion and sediment control land use regulations of the Town in which the construction activity is conducted. For projects with a total disturbed area between one and five acres, a registration is not necessary according

to Section 4 of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities as long as it receives town review and written approval of its erosion and sediment control measures and follows the Guidelines. If no review is conducted by the Town, the permittee must register and comply with Section 6 of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities.

The Town's Zoning Regulations, Subdivision Regulations and Inland Wetland and Watercourse Regulations will be modified to include procedures for notifying construction site developers and operators of the requirements for registration under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities. Construction activities as defined in the General Permit include, but are not limited to, clearing, grubbing, grading, excavation, placement of fill and dewatering activities.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 6.6 Procedures for Notifying Construction Site Developers and Operators of Requirements for Registration BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Continue Notifying Construction Site Developers and Operators of Requirements for Registration.	Land Use Administrator

7 POST-CONSTRUCTION STORMWATER MANAGEMENT

Studies indicate that prior planning and design for the minimization of pollutants in post-construction stormwater discharges is the most cost-effective approach to stormwater quality management.

There are two significant water quality impacts generally associated with post-construction runoff. The first is caused by an increase in the type and quantity of pollutants in stormwater runoff. As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such as lakes, ponds, and streams. Once deposited, these pollutants can enter the food chain through small aquatic life that are consumed by larger fish, predatory birds and mammals, including humans. The pollutants bio accumulates in the fatty tissues of animals.

The second significant water quality impact occurs due to the increased quantity of water delivered to the waterbody during storms. Increased impervious surfaces interrupt the natural cycle of gradual percolation of water through vegetation and soil. Instead, water is collected from surfaces such as asphalt and concrete and routed to drainage systems where large volumes of runoff quickly flow to the nearest receiving waterbody. The effects of this process include stream bank scouring and downstream flooding, which often leads to the degradation of aquatic habitats and damage to property.

An effective post-construction site runoff control program will minimize water quality impacts and attempt to maintain pre-development runoff conditions.

7.1 REQUIREMENTS

The development, implementation and enforcement of a program, or modification of an existing program is required to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one (1) acre, including projects less than one acre that are part of a larger common plan of development that discharges into the Town's storm sewer systems or directly to the waters of the State. The program shall ensure that controls are implemented to require appropriate infiltration practices, reduction of pervious surfaces, creation of or conversion to sheet flow, and measures and/or structures to reduce sediment discharge. The program shall also include innovative measures that will prevent or minimize water quality impacts and include the following:

7.1.1 Establish or update legal authority regarding low impact development (LID) and runoff reduction in site development planning.

7.1.2 Enforce LID/runoff reduction requirements for development and redevelopment projects to the extent allowable under State or local law.

7.1.3 Ensure long-term maintenance for stormwater basins and treatment structures.

7.1.4 Maintain Directly Connected Impervious Area (DCIA) maps.

7.1.5 Address post construction issues with pollutants of concern.

Appropriate BMPs and measurable goals for this minimum control measure are detailed below.

7.2 BEST MANAGEMENT PRACTICES

The following BMPs will be utilized in the implementation of the program to address the minimum control measure for Post-Construction Stormwater Management.

7.2.1 Legal Authority Regarding LID and Runoff Reduction

Post-construction runoff from construction and reconstruction projects will be regulated by the town's Subdivision Regulations, Zoning Regulations, and Inland Wetlands and Watercourse Regulations. These regulations shall be updated to include LID and runoff reduction requirements.

The Town currently has procedures in place for the enforcement of these regulations as listed in the following:

Zoning Regulations
Article 14, Administration and Enforcement

Subdivision Regulations
Article 14, Administrative Procedures

Inland Wetland and Watercourse Regulations
Section 6, Regulated Activities to be License
Section 14, Enforcement

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 7.1 Legal Authority Regarding LID and Runoff Reduction BMP Measurable Goals and Implementation Dates

Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1	Continue procedures for addressing post-construction BMPs including projects with 1 to 5 acres in disturbance.	Land Use Administrator
Year 1-4	Update legal authority and guidelines regarding LID and runoff reduction.	Land Use Administrator
Year 1-5	Continue to enforce regulations.	Land Use Administrator

7.2.2 Long-Term Maintenance of Stormwater Basins and Treatment Structures

The Town will ensure long-term maintenance of stormwater basins and treatment structures within the Urbanized Area or with either DCIA of greater than 11% or which discharge to

impaired waters. Stormwater basins shall be inspected at least annually and accumulated sediment shall be removed to restore full solids capture design capacity. Treatment structures will be inspected at least annually and accumulated pollutants (such as sediment, oils, leaves, litter, etc.) will be removed to restore full soils capture design capacity.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 7.2 Long-term Maintenance of Stormwater Basins and Treatment Structures BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-2	Implement long-term maintenance of stormwater basins and treatment structures through scheduled maintenance.	Superintendent of Highways
Year 2-5	Continue to inspect and maintain stormwater basins and treatment structures.	Superintendent of Highways

7.2.3 DCIA Mapping

The Town will calculate the Directly Connected Impervious Area (DCIA) that contributes stormwater runoff to each of its MS4 outfalls by using mapping available through the CTDEEP. The maps and DCIA value will be updated annually to reflect changes in the Town's land cover resulting from development, redevelopment and/or retrofit projects.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 7.3 DCIA Mapping BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-3	Develop and analyze DCIA maps	Superintendent of Highways Webmaster
Year 3-5	Continue to maintain DCIA maps and calculations.	Superintendent of Highways Webmaster

7.2.4 Post-Construction Issues in Areas with Pollutants of Concern

The Town will be required to perform additional short-term and long-term maintenance to stormwater features that discharge into waters for which Nitrogen, Phosphorus or Bacteria is a Stormwater Pollutant of concern. The Town will develop, fund, implement and prioritize retrofit programs to address erosion and sediment problems. Section 8.2.8 discusses this BMP in further detail.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 7.4 Post-Construction Issues in Areas with Pollutants of Concern BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1	Inspect stormwater features that discharge to impaired waters. Prioritize projects to eliminate polluted stormwater.	Superintendent of Highways
Year 2-5	Continue to implement short-term and long-tern maintenance plans.	Superintendent of Highways

8 POLLUTION PREVENTION / GOOD HOUSEKEEPING

This minimum control measure helps to improve or protect receiving water quality by evaluating, altering and maintaining Town facility operations.

This measure requires the Town to examine and subsequently alter its own actions to help ensure a reduction in the amount and type of pollution that collects on roadways, parking lots, open spaces, storage, vehicle maintenance areas, and all Town-maintained facilities. This measure will also address pollution that results from actions such as environmentally damaging land development and flood management practices or poor maintenance of storm sewer systems.

8.1 REQUIREMENTS

Town Wide

8.1.1 The updating and implementation of the existing training program for town employees and contractors with the ultimate goal of preventing or reducing pollutant runoff from municipal operations.

8.1.2 Utilize training materials that are available from the EPA, the State or other organizations. This program shall include employee training to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance.

8.1.3 The implementation of a program to inspect and maintain streets, parking areas and other MS4 infrastructure. This maintenance includes sweeping all streets at least annually as soon as possible after snowmelt.

8.1.4 The development and implementation of a program to evaluate and, if necessary, clean catch basins and other stormwater structures that accumulate sediment at least annually including a provision to identify and prioritize those structures that may require cleaning more than once a year.

8.1.5 The development and implementation of standard operating practices for the use, handling, storage, application, and disposal of deicing products such as salt and sand to minimize exposure to stormwater.

8.1.6 The implementation of a program for repairing, retrofitting or upgrading the conveyances, structures and outfalls of the MS4.

Urbanized Areas

8.1.7 The development and implementation of a retrofit program to "disconnect" DCIA through retrofits or redevelopment projects that utilize Low Impact Development and runoff reduction measures.

8.1.8 The development and implementation of a program to evaluate and prioritize those streets that may require sweeping more than once a year.

Appropriate BMP's and measurable goals for this minimum control measure must be determined. These must include the persons(s) or position(s) responsible and implementation dates for each BMP.

8.2 BEST MANAGEMENT PRACTICES

The following BMP's will be utilized in the implementation of the program to address the minimum control measure for Pollution Prevention / Good Housekeeping for Municipal Operations.

8.2.1 Operation and Maintenance Program

Operation and maintenance is an integral component of all stormwater management programs. This measure is intended to improve the efficiency of the individual programs through appropriate maintenance practices, internal procedures and scheduling. Proper development and implementation of these programs reduces the risk of water quality problems. There are several elements that are essential for the success of an operation and maintenance program including, training, record keeping, internal reporting, maintenance and preventative maintenance. The Town will include the following elements in the development and implementation of their program.

Employee Training

The Town will update their formal employee training program to increase awareness of water quality related issues in management of its MS4. The training will focus on pollution prevention, best management practices and good housekeeping. Training will include procedures for identification and reporting of illicit discharges and improper disposal and spill response protocols and respective responsibilities of involved personnel. The training program will also include water quality monitoring, inspection, record keeping, internal reporting, general maintenance, preventative maintenance and other topics relating to proper stormwater management and the requirements of the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems. Employee training is detailed further in Section 8.2.2.

Record Keeping

The Town's procedures for record keeping will incorporate the required documentation of information and data, resulting from the General Permit procedures. Keeping records of spills, leaks, inspections, scheduled maintenance and other stormwater related issues provides useful information for ensuring proper operation of facilities and equipment with the ultimate goal of improving best management practices and water quality. The following list of topics are essential for a successful records keeping program, some of which are required for the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems Annual Reports to CTDEEP:

- Public Education
- Public Participation
- Illicit Discharges (including corrective measures)
- Water Quality Monitoring
- Employee Training
- Drainage Facility Inspections
- Street Sweeping
- Catch Basin Cleaning

The key to a successful records keeping program is maintaining records through regularly scheduled updates. The Town may utilize the following techniques to document and report their data and results:

- Field notebooks
- Timed and dated photographs
- Drawings and maps
- Computer spreadsheets and database programs

Record keeping will be coordinated with the Town's internal reporting procedures and other BMPs as it is integrated into the development of the Town's Stormwater Pollution Prevention Plan.

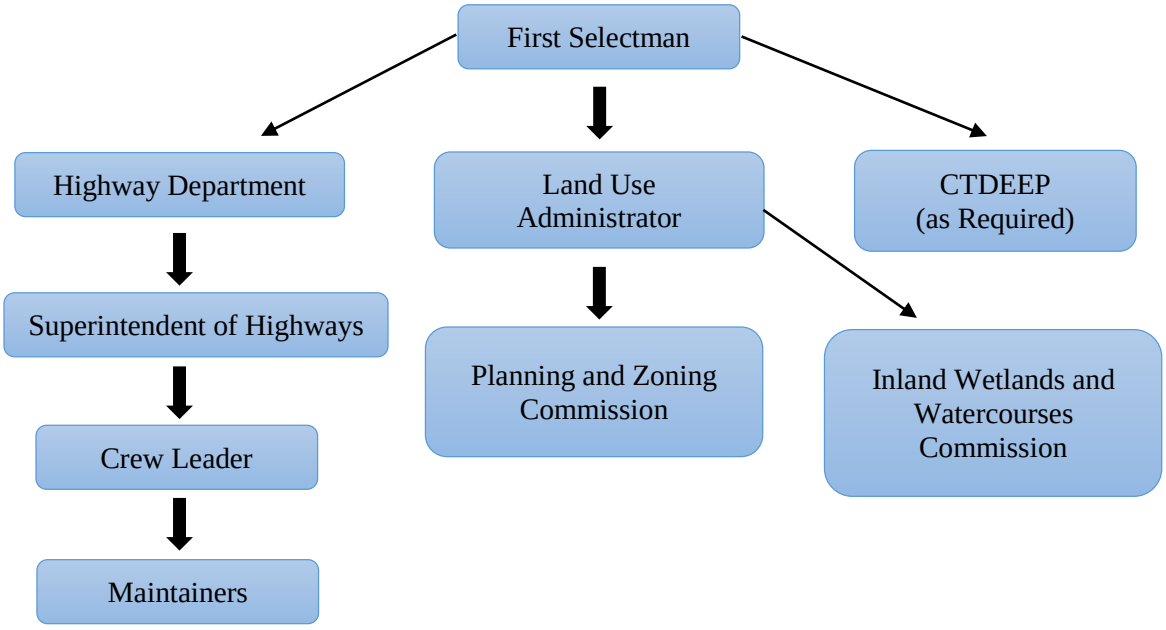
The Town will submit annual reports containing records required by the General Permit to the CTDEEP. These annual reports will include information as described in Section 10 "Additional Requirements" of this plan, and will meet the requirements of the General Permit.

Internal Reporting

Internal reporting provides a framework for "chain-of-command" reporting of stormwater management issues. When properly employed, internal reporting procedures can clearly define individuals' roles and responsibilities for implementing and maintaining the Stormwater Pollution Prevention Program, thereby making it easier to prevent and contain potential stormwater contamination.

The Town's internal reporting procedures will incorporate the additional effort needed with this stormwater management program, and the position(s) responsible for each stormwater management task. In general, the position(s) responsible for each BMP are listed in a table at the end of each minimal control measure section of this stormwater management plan. If the issue requires special attention, the Town will notify the CTDEEP. The following figure depicts the typical reporting hierarchy or "chain-of-command" that may be followed for issues relating to stormwater management.

Figure 8.1 Typical Internal Reporting Flow Chart



Maintenance Program

Maintenance involves pollution prevention techniques that reduce or eliminate pollutant loadings from existing Town owned and maintained roadways, parking lots and facilities as part of the operation and maintenance program. Significant amounts of pollutants are generated during daily roadway and facility use, and these pollutant loadings can threaten local water quality by contributing heavy metals, hydrocarbons, sediment, and debris to stormwater runoff. Good maintenance practices, including street sweeping and catch basin cleaning can help limit impacts to water resources. These practices are especially important after the winter months because large quantities of salt are applied to the roadways to make travel possible during inclement weather.

The Town's maintenance plan for sweeping roadways, parking lots and facilities, and cleaning catch basins will meet the requirements of the General Permit. Street sweeping and catch basin cleaning are detailed further in Sections 8.2.9 & 8.2.10, respectively.

Maintenance shall also include the following:

- Parks and open space
- Pet waste management
- Waterfowl management
- Buildings and facilities
- Vehicles and equipment
- Leaf management

Preventative Maintenance Program

Preventative maintenance measures are intended to reduce the frequency and quantity of pollutants that are discharged to waterbodies as a result of the failure and deterioration of ageing systems. Preventative maintenance will continue to be utilized by the Town for eliminating potential problems associated with drainage systems, facilities and equipment. The measures generally utilized by the Town are performed during the following activities:

- Catch basin inspection during routine maintenance
- Drainage system inspection for new construction / reconstruction projects.

Preventative maintenance is detailed further in Section 8.2.12.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 8.1 Operation and Maintenance Program BMP Measurable Goals and Implementation Dates

Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1	Review current Operation and Maintenance procedures and revise to meet the requirements of the General Permit.	Superintendent of Highways
Year 2-5	Implement Operation and Maintenance requirements.	Superintendent of Highways

8.2.2 Employee Training Program

The Highway Department currently holds annual training for its employees to discuss topics relating to spill prevention and spill containment procedures. The existing training program includes a stormwater management component to discuss potential sources of contaminants, and best management practices. This program provides personnel with an understanding of the Town's stormwater management plan, including BMPs, processes and materials with which they are working, safety hazards, practices for preventing spills, and procedures for responding quickly and properly

to toxic and hazardous material incidents. The program will include topics on sedimentation and erosion control, permanent BMPs, and permit requirements. They will also be informed of the proper procedures for reporting and documenting any potential pollutants discovered.

The following scheduled training will be scheduled to meet the requirements of the General Permit:

Annually

The Highway Department will continue to conduct their annual "tailgate" meetings to discuss spill prevention and containment issues. These meetings include stormwater management topics as they relate to the General Permit requirements. Training will continue in the first year of the program and proceed annually throughout the program. Subsequent meetings will be conducted as refresher courses. The training sessions will continue in the first year of the program and proceed annually throughout the program.

The employee training program is intended to train new employees and remind current employees of proper operations and procedures.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 8.2 Formal Employee Training Program
Measurable Goals and Implementation Dates

Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1	Modify the existing Employee Training "Tailgate Meetings" to incorporate the requirements of the General Permit	Superintendent of Highways
Year 2	Implement Training requirements	Superintendent of Highways
Year 3-5	Continue Employee Training requirements	Superintendent of Highways

8.2.3 Coordination with Interconnected MS4s

In accordance with Section 6(a)(6)(F) of the General Permit, the Town shall coordinate with operators of interconnected MS4s (such as neighboring municipalities, institutions and CTDOT). The operators of the interconnected MS4s will determine potential pollutants from the storm sewer systems and contributing land use areas. The operators shall also coordinate operation and maintenance procedures to reduce potential pollutants.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 8.3 Coordination with Interconnected MS4s BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-2	Meet with operators of interconnected MS4s. Coordinate operations and maintenance procedures.	Superintendent of Highways
Year 3-5	Continue to coordinate operations and maintenance procedures with operators of interconnected MS4s.	Superintendent of Highways

8.2.4 Program to Control Other Sources of Pollutants

In accordance with Section 6(a)(6)(G) of the General Permit, the Town "shall develop and implement a program to control the contribution of pollutants to its MS4 from commercial, industrial, municipal, institutional or other facilities, not otherwise authorized by permit issued pursuant to Sections 22a-430 or 22a-430b."

Table 8.4 Program to Control Other Sources of Pollutants BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-2	Develop program to control other sources of pollutants.	Superintendent of Highways
Year 3-5	Implement program to control other sources of pollutants.	Superintendent of Highways

8.2.5 Discharges to Impaired Waters

In accordance with Section 6(a)(6)(H) of the General Permit, the Town is required to perform additional measures for waters that have nitrogen, phosphorus and/ or bacteria as stormwater pollutants of concern.

According to the Integrated Water Quality Report, there are four impaired waterbody segments in the Town:

- Naugatuck River (6900-00_05)
- Naugatuck River (6900-00_06)
- Branch Brook (6910-00_01)
- Branch Brook (6910-00_02)

The two segments of the Naugatuck River have bacteria as the pollutant of concern.

The two segments of Branch Brook have a non-pollutant impairment, caused by upstream impoundments and flow alterations from water diversions.

The Town will evaluate potential retrofit projects that will benefit the impaired waterbodies. See Section 8.2.8 for more detail about Retrofit Projects.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 8.5 Additional Measures for Discharges to Impaired Waters BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-2	Fund retrofits to reduce pollutants to impaired water bodies. Identify problem areas in Annual Report.	Superintendent of Highways
Year 3-5	Implement and prioritize retrofits to reduce pollutants to impaired water bodies. Continue to identify problem areas in Annual Report.	Superintendent of Highways

8.2.6 Tracking Disconnect DCIA Projects

Annually, starting at the effective date of this general permit, the Town shall track the total acreage of Directly Connected Impervious Area (DCIA) that is disconnected as a result of a redevelopment or retrofit project in public and private sites. The tracking can include DCIA modifications that occurred up to five years prior to the effective date of the General Permit.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 8.6 Track Projects that Disconnect DCIA BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Track projects that disconnect DCIA, and include in annual report.	Superintendent of Highways

8.2.7 Infrastructure Repair/Rehab Program

In accordance with Section 6(a)(6)(B)(i) of the General Permit, the Town shall fund and "implement a program for repairing, retrofitting or upgrading the conveyances, structures and outfalls of the MS4."

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 8.7 Infrastructure Repair/Rehab Program BMPs Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Repair and rehabilitate the MS4 infrastructure in a timely manner.	Superintendent of Highways

8.2.8 Plan to Identify/Prioritize Retrofit Projects

According to Section 6(a)(6)(B)(ii) of the General Permit, "a retrofit project is one that modifies an existing developed site for the primary purpose of disconnecting DCIA." The Town will use the DCIA Mapping described in Section 7.2.3 to prioritize retrofit projects. Redevelopment and retrofit projects should utilize Low Impact Development and runoff reduction measures.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 8.8 Plan to Identify/Prioritize Retrofit Projects BMPs Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-3	Develop plan to implement retrofit projects.	Superintendent of Highways
Year 3-5	Implement retrofit projects.	Superintendent of Highways

8.2.9 Street Sweeping Program

Street sweeping is practiced in most urban areas, to remove sediment buildup and large debris from curb gutters. Street sweeping is also used during the spring snowmelt to reduce pollutant loads from road salt and to reduce sand export to receiving waters.

The Town will conduct street sweeping on a scheduled basis to minimize pollutant export to state and local waterbodies. These cleaning practices will remove sediment, large debris from curb gutters and other pollutants, from roadways, parking lots and facility surfaces, which are a potential source of pollution impacting state and local waterbodies. Street sweeping frequency will range from one time per year, to multiple times per year for areas with heavier concentrations of sediment and debris. The Town will utilize the following criteria for street sweeping frequency:

<u>Town Wide</u>

The Town will sweep all of its roadways, parking lots and facilities at least once every year. The sweeping will be performed as soon as possible after snowmelt.

Urbanized Areas

The town will perform one or more sweeps per year for priority areas, where sediment/debris has been known to accumulate in higher quantities. In 2007, the Town switched to an-all salt based product, which has minimized the amount of sediment in the streets, so additional sweeping will probably not be necessary. The first sweep will be performed as soon as possible after snowmelt.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 8.9 Street Sweeping Program BMP
Measurable Goals and Implementation Dates

Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Continue Street Sweeping	Superintendent of Highways

8.2.10 Catch Basin Maintenance Program

Catch basins fitted with sumps are intended to retain coarse sediment by trapping this material in a chamber or low area below the invert of the outlet pipe. By trapping sediment, the catch basin prevents solids from clogging the storm sewer and being washed into receiving waters. Catch basins must be cleaned to maintain their ability to trap sediment, and consequently their ability to prevent flooding. The removal of sediment, decaying debris and highly polluted water from catch basins has both aesthetic and water quality benefits. These include reducing foul odors, reducing suspended solids, and reducing the load of oxygen-demanding substances that reach receiving waters.

The Town will continue their catch basin maintenance program and modify it to meet the requirements of the General Permit. This will consist of inspecting and if cleaning catch basins on a regularly scheduled basis. The Town will use the following criteria for inspecting and cleaning their catch basins:

- The Town, at a minimum, will annually evaluate and, if necessary, clean catch basins and other stormwater structures that accumulate sediment. Typically, all catch basins in Town are cleaned in the spring and fall each year to prevent having to clean subsurface storm sewer pipe segments between structures.
- Priority areas will be established to maximize the effectiveness of the Town's available resources for the routine inspections. These priority areas will be developed using the town's knowledge of problem areas, where sediment/debris has been known to accumulate in higher quantities. Geographical location, climate, traffic patterns and vertical sag locations may also be factors in determining priority areas.

The Town will evaluate roads in in the immediate vicinity of watercourses and waterbodies, and the Town will implement additional catch basin cleanings as needed.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 8.10 Street Sweeping Program BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Continue Catch Basin Maintenance	Superintendent of Highways

8.2.11 Snow Management Practices

Standard operating practices for the use, handling, storage, application, and disposal of deicing products shall be developed. The Town shall also develop and implement standard operating practices to minimize the discharge of sand, anti-icing or deicing chemicals and other pollutants to stormwater. Snow management practices shall be in accordance with CTDEEP's Best Management Practices for Disposal of Snow Accumulations from Roadways and Parking Lots.

In the Annual Report, the Town shall document the results of its snow management program including the following:

- Type of staff training conducted on application methods and equipment
- Type(s) of deicing materials used
- Lane-miles treated
- Total amount of deicing material used
- Type(s) of deicing equipment used
- Any changes in deicing practices (and the reasons for the change)
- Snow disposal methods

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 8.11 Snow Management Practices BMP Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Develop and implement standard operating practices for snow management. Include results in the Annual Report.	Superintendent of Highways

8.2.12 Preventative Maintenance Program

Preventative maintenance takes a proactive approach to stormwater management and by attempting to prevent problems before they occur. This measure involves the inspection, evaluation and replacement or repair of equipment and operational systems. Inspection can identify cracks, leaks, and other conditions that could cause breakdowns or failures of stormwater structures and equipment, which in turn could result in discharges of pollutants to surface waters either by direct overland flow or through storm drainage systems.

In general, the preventative maintenance of drainage systems is accomplished through visual inspections conducted as a result of routine maintenance such as catch basin cleaning, or new construction projects.

Preventative maintenance is also required by public agencies and private developers disturbing or affecting Town storm sewer systems through new development or modifications to adjacent existing developments. These entities are required to conduct an "Existing Drainage Facility Conditions Survey" for the portion of the Town's drainage system(s) that they will be tying into or affecting as a result of the modifications. The guidelines for this survey are summarized below, and are provided in greater detailed in CTDOT's "Drainage Manual", Section 3.6.3 and Appendices 4.A & B.

- Culvert inspection shall be conducted for existing town culverts to remain in use, as part of a project. Culvert inspection shall follow the guidelines as outlined in the CTDOT's "Drainage Manual 2000", Appendix 4.A.

- Existing Town drainage facilities including pipes, catch basins, manholes, junction chambers, sedimentation/gross particle separators, cross culverts and ditches/swales, which are scheduled to remain in use as part of a project, should be inspected to verify their general condition early in the design process.

- A condition survey must be conducted for drainage systems which have been in service for 10 years or more. Available previous condition reports should be reviewed prior to inspection to identify critical areas that may require special attention. The drainage facility inspection shall follow the guidelines as outlined in the CTDOT's "Drainage Manual 2000", Appendix 4.B.

- The designer should also consult with the Town for past problems, site conditions and proposed future improvements.

Preventative maintenance involving construction activities in Natural Diversity Database (NDDB) areas, CTDEEP shall be contacted and work coordinated with that agency and shall comply with all Town, State and Federal regulations.

The measurable goals, target dates and responsible position associated with this BMP are detailed in the following table.

Table 8.12 Preventative Maintenance BMP
Measurable Goals and Implementation Dates

Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1-5	Continue Preventative Maintenance Program	Superintendent of Highways

9 MONITORING REQUIREMENTS

The screening and monitoring requirements are outlined in Section 6(i) of the General Permit.

9.1 SCREENING REQUIREMENTS

MS4s that discharge to impaired streams shall be monitored. Screening of outfalls that discharge to impaired waters shall begin within one year of the effective date of the General Permit. At least fifty percent (50%) of these outfalls shall be screened by the end of the third year, and one hundred percent (100%) of the outfalls shall be screened by the end of the fifth year (See Table 9.2 for the schedule). The outfalls that discharge directly to the Naugatuck River will be monitored from upstream to downstream over the first three years of the permit. This schedule will be adjusted if other outfalls that are not currently listed in the GIS system are discovered during the map updates described in Section 5.2.2.

Outfall monitoring shall be conducted after a storm that produces a discharge from the outlet. The storm shall also be at least 48 hours after any previous rain storm that produced a discharge from the outlet. The outfall monitoring shall consist of a single grab sample taken within the first six (6) hours of the discharge from the outfall.

When monitoring for pollutants of concern other than phosphorus, nitrogen or bacteria, two samples shall be taken. One sample from the outfall, and one sample in-stream immediately upstream of the outfall. The turbidity of both samples shall be compared in the field.

Unless otherwise specified, all pollutant parameters shall be tested according to methods prescribed in Title 40, CFR, Part 136 (1990).

The following information shall be collected for stormwater screening:

- Date
- Air Temperature
- Time of the start of the discharge
- Time of sampling
- Magnitude (in inches) of the storm event sampled
- Duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event

Outfalls will require follow-up investigation if the results are greater than the above parameters in Table 9.1.

Table 9.1 Stormwater Outfall Screening	
Pollutant	Concentration
Nitrogen	Total Nitrogen > 2.5 mg/L
Phosphorus	Total Phosphorus > 0.3 mg/L
Bacteria	E.coli > 235 col/100mL (for swimming) E. coli >410 col/100mL (for all others) Total Coliform > 500 col/ 100mL Enterococci > 104 col/ 100mL (for swimming) Enterococci > 500 col/ 100mL (for all others)

Follow-up investigations on the screened outfalls shall occur within two years of the effective permit. Follow-up investigations include analyzing the drainage area and implementing BMPs to improve activities within the drainage area.

The six outfalls with the highest contribution of any of the pollutants of concern will be monitored annually. These six priority outfalls must be selected by the start of the fourth year after the effective date of the General Permit.

Table 9.2 Stormwater Outfall Monitoring Measurable Goals and Implementation Dates		
Target Date	Measurable Goal/ Activity	Responsible Department or Person
Year 1	Screening Outfalls: 84, 85, 138, 139 & 140	Superintendent of Highways
Year 2	Screening Outfalls: 21, 22, 23, 24 & 250 Follow up Investigation on outfalls with high pollutant concentrations.	Superintendent of Highways
Year 3	Screening Outfalls 4,5,8, 20 & 48 Follow up Investigation on outfalls with high pollutant concentrations.	Superintendent of Highways
Year 4 -5	Annually monitor the six priority outfalls	Superintendent of Highways

10 ADDITIONAL REQUIREMENTS

10.1 AUTHORIZATION UNDER THIS GENERAL PERMIT

10.1.1 Eligible Activities

The discharge of stormwater from or associated with a Regulated Small MS4 is authorized by this General Permit, provided the requirements of Section 3(a) are satisfied and the activity is conducted in accordance with the conditions of this stormwater management plan.

This permit authorizes the following non-stormwater discharges provided they do not contribute to a violation of water quality standards:

- Uncontaminated groundwater discharges such as pumped ground water, foundation drains, water from crawl space pumps and footing drains
- Irrigation water including landscape irrigation and lawn watering
- Residual street wash water associated with sweeping
- Discharges or flows from firefighting activities (except training)
- Naturally occurring discharges such as rising ground waters, uncontaminated groundwater infiltration (as defined at 40 CFR 35.2005(20)), springs, diverted stream flows and flows from riparian habitats and wetlands

10.1.2 Requirements for Authorization

This General Permit authorizes the activity listed in Section 3(a) provided:

Coastal Management Act
Such activity is consistent with all applicable goals and policies in Section 22a-92 of the Connecticut General Statutes, and must not cause adverse impacts to coastal resources as defined in Section 22a-93(15) of the Connecticut General Statutes.

Endangered and Threatened Species
Such activity shall not threaten the continued existence of any species listed as endangered or threatened pursuant to Section 26-306 of the Connecticut General Statutes and shall not result in the destruction or adverse modification of habitat designated as essential to such species. Future projects that are located within the NDDB area shall be completed with the necessary permitting.

Aquifer Protection Areas
Such activity, if it is located within an aquifer protection area as mapped under section 22a-354b of the Connecticut General Statues, must comply with regulations adopted pursuant to section 22a-354i of the Connecticut General Statues.

High Quality Waters
At least thirty (30) days before a new or increased discharge from the MS4 to a High Quality Water, the Town must document compliance with the Anti-

Degradation Implementation Policy in the Water Quality Standards, as amended.

National Historic Preservation Act
Stormwater discharges or implementation of the registrant's stormwater management program shall not adversely affect properties listed or eligible for listing in the National Register of Historic Places, unless the registrant is in compliance with requirements of the National Historic Preservation Act and has coordinated with the appropriate State Historic Preservation Officer to avoid or minimize impacts from any necessary activities.

10.2 PROPER OPERATION AND MAINTENANCE

The Town will properly operate and maintain all facilities and systems of treatment and control, including related appurtenances, which are installed or used by the Department to achieve compliance with the conditions of the general permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by the Department when necessary to achieve compliance with this permit. Section 8 of this document contains detailed information for specific operation and maintenance measures.

10.3 AVAILABILITY OF INFORMATION

The Town will make a copy of the Stormwater Management Plan available to the public via the Town website. If the Commission requests information pertinent to the authorized activity or to compliance with this General Permit, the Town shall provide such information within 30 days of the request.

10.4 KEEPING PLANS CURRENT

In accordance with Section 6(k) of the General Permit, the Town will amend the Stormwater Management Plan whenever: (1) there is a change which has the potential to cause pollution of the waters of the State; or (2) the actions required by the SWMP fail to ensure or adequately protect against pollution of the waters of the State; or (3) the Commissioner of CTDEEP requests modification of the SWMP. The amended Plan will be completed and all actions required by such SWMP will be completed within a time period determined by the Commissioner of CTDEEP.

The Commissioner of CTDEEP may notify the Department at any time that the SWMP does not meet one or more of the requirements of this General Permit. Within 30 days of such notification, unless otherwise specified by the Commissioner of CTDEEP in writing, the Department will respond to the Commissioner of CTDEEP indicating how they plan to modify the SWMP to address these requirements. Within 90 days of this response or within 120 days of the original notification, whichever is less, unless otherwise specified by the Commissioner of CTDEEP in writing, the Department will then revise the SWMP, perform all actions required by

the revised SWMP, and shall certify to the Commissioner of CTDEEP that the requested changes have been made and implemented. The Department will provide such information, as the Commissioner of CTDEEP requires to evaluate the SWMP and its implementation.

10.5 REPORTING AND RECORD KEEPING

In accordance with Section 6(j) of the General Permit, records required by the General Permit will be kept for at least 5 years following its expiration or longer if requested by the Commissioner of CTDEEP in writing. Such records, including the Stormwater Management Plan, will be available to the public at reasonable times during regular business hours.

The Town will continue to submit an Annual Report to CTDEEP by April 1. The reports will be submitted electronically to the CTDEEP.

10.6 GENERAL DISCHARGE REQUIREMENTS

There will be no distinctly visible floating scum, oil or other matter contained in the stormwater discharge. Excluded from this are naturally occurring substances such as leaves and twigs provided no person has placed such substances in or near the discharge.

The stormwater discharge will not result in pollution due to acute or chronic toxicity to aquatic and marine life, impair the biological integrity of aquatic or marine ecosystems, or result in an unacceptable risk to human health.

10.7 TOTAL MAXIMUM DAILY LOADS

The CTDEEP is responsible for monitoring the waters of Connecticut, identifying those waters that are impaired, and developing a plan to bring them back into compliance with the Connecticut Water Quality Standards. The list of impaired waters, better known as the "303d list," identifies river, lake, and coastal waters that are impaired and the reasons for impairment.

Once a water body is identified as impaired, the CTDEEP is required by the Federal Clean Water Act (CWA) to develop a strategy for restoring the health of the impaired water body. The process of developing this strategy, which is generally referred to as a Total Maximum Daily Load (TMDL) includes identifying the type of pollutant, and the potential sources of the pollutant, in addition to determining the maximum amount of pollutant that can be discharged to a specific surface water body in order to meet surface water quality standards. Part of the TMDL also includes the development of a plan to help in meeting the TMDL limits once they have been established.

As part of the SWMP, communities are required to develop BMPs for surface water bodies within their jurisdiction for which a TMDL has already been developed. These impaired waters are listed under Category 4A in the Connecticut Integrated Quality Report. Based on the 2014 Final Integrated List of Waters.

The CTDEEP has established a TMDL for sections of the Naugatuck River for Escherichia coli (E. coli). The outfalls that discharge into these sections of the Naugatuck River will be monitored in accordance with monitoring requirements discussed in Section 9 of this SWMP,

and BMPs including IDDE and retrofit projects will be conducted. In the attempt to further reduce the pollutant loading from stormwater runoff along roads in close proximity to the Naugatuck River within the TMDL restrictions.

The sweeping of these roads is detailed in Section 8.2.9 of the SWMP.

If the stormwater discharge(s) do not meet the TMDL allocations, the Town will modify its Stormwater Management Plan to implement the TMDL. If any TMDLs are modified or added, the Town will meet the TMDL allocation within four months of the TMDLs approval and notify the Commissioner of CTDEEP of this modification

10.8 REGULATIONS OF CONNECTICUT STATE AGENCIES INCORPORATED INTO THE DISCHARGE OF STORMWATER FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS

In accordance with Section 7 of the General Permit, the town will comply with all laws applicable to the subject discharges, including but not limited to, the following Regulations of Connecticut State Agencies which are hereby incorporated into this general permit, as if fully set forth herein:

Section 22a-430-3:

- Subsection (b) General — subparagraph (1)(D) and subdivisions (2), (3), (4) and (5)
- Subsection (c) Inspection and Entry
- Subsection (d) Effect of a Permit — subdivisions (1) and (4)
- Subsections (e) Duty to Comply
- Subsections (f) Proper Operation and Maintenance
- Subsection (g) Sludge Disposal
- Subsection (h) Duty to Mitigate
- Subsection (i) Facility Modifications, Notification — subdivisions (1) and (4)
- Subsection (j) Monitoring, Records and Report Requirements — subdivisions (1), (6), (7), (8), (9) and (11) (except subparagraphs (9) (A) (2) and (9) (c)
- Subsection (k) Bypass
- Subsection (m) Effluent Limitations Violations
- Subsection (n) Enforcement
- Subsection (p) Spill Prevention and Control
- Subsection (q) Instrumentation, Alarms, Flow Recorders
- Subsection (r) Equalization

Section 22a-430-4

- Subsection (t) Prohibitions
- Subsection (p) Revocation, Denial, Modification
- Appendices

10.9 DUTY TO CORRECT AND REPORT VIOLATIONS

Upon learning of a violation of a condition of the general permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems, the Town will immediately take all reasonable action to determine the cause of such violation, correct and mitigate the results of such violation and prevent further such violation. The Town will report in writing such violation and such corrective action to the Commissioner of CTDEEP within five (5) days of the Department's learning of such violation. Such information will be filed in accordance with the certification requirements of this General Permit.

10.10 DUTY TO PROVIDE INFORMATION

In accordance with Section 7(d) of the General Permit:

"If the Commissioner requests any information pertinent to the authorized activity or to compliance with the general permit or with the Department's authorization under this general permit, the town will provide such information within thirty (30) days of such request. Such information shall be filed in accordance with the certification requirements prescribed in Section 7(e) of this general permit."

10.11 CORRECTION OF INACCURACIES

In accordance with Section 7(h):

"Within fifteen days after the date the town becomes aware of a change in any information in any material submitted pursuant to this general permit, or becomes aware that any such information is inaccurate or misleading or that any relevant information has been omitted, the Department will correct the inaccurate or misleading information or supply the omitted information in writing to the Commissioner. Such information will be filed in accordance with the certification requirements prescribed in Section 7(e) of this general permit."

10.12 OTHER APPLICABLE LAW

In accordance with Section 7(h):

Nothing in the General Permit shall relieve the Town of the "obligation to comply with any other applicable federal, state, or local law, including, but not limited to the obligation to any other authorizations required by such law."

11 CERTIFICATION AND SIGNATURE

11.1 CERTIFICATION REQUIREMENTS

This plan and any document, including but not limited to any notice, information or report, which is submitted to the Commissioner of the CTDEEP under the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems shall be signed by the chief elected official or principal executive officer, and by the individual or individuals responsible for preparing such document as defined in Section 22a-430-3(b) (2) of the Regulations of Connecticut State Agencies.

11.2 PLAN CERTIFICATION AND SIGNATURE

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

Registrant's Signature
Edmond V. Mone
First Selectman
Town of Thomaston, Connecticut

3/31/17
Signature and Date

Preparer's Signature
Christopher B. Wester, P.E.
Vice President
Weston & Sampson Engineers, Inc.

3-31-17
Signature and Date

Preparer's Signature
Raju Vasamsetti, P.E.
Project Manager
Weston & Sampson Engineers, Inc.

03/31/17
Signature and Date

APPENDIX A

ABBREVIATIONS AND DEFINITIONS

ABBREVIATIONS AND DEFINITIONS

The definitions of terms used in this general permit shall be the same as the definitions contained in Sections 22a-423 and 22a-207 of the Connecticut General Statutes and Section 22a-430-3(a) of the Regulations of Connecticut State Agencies. As used in this general permit, the following additional definitions shall apply:

"*ADT*" means average daily traffic

"*Attorney General*" means the chief law officer and legal counsel of the State of Connecticut.

"*Authorized activity*" means any activity authorized under the General Permit for the Discharge of Storm Water from Small Municipal Separate Storm Sewer Systems.

"*Best Management Practices (BMP)*" means those practices, which reduce pollution and which have been determined by the Commissioner of the Connecticut Department of Environmental Protection, to be acceptable based on, but not limited to, technical, economic, and institutional feasibility.

"*Catch Basin*" means any structure designed and constructed to collect storm water runoff and convey the flows through a storm sewer system.

"*Coastal area*" means coastal area as defined in Section 22a-94 of the Connecticut General Statutes.

"*Coastal waters*" means coastal waters as defined in Section 22a-29 of the Connecticut General Statutes.

"*Co-permittee*" means any adjacent or adjoining (to the department) municipality, state agency/institution or private entity required to register under the General Permit.

"*CTDEEP*" means the Connecticut Department of Energy and Environmental Protection.

"*CTDOT*" means the Connecticut Department of Transportation.

"*CWA*" means Clean Water Act.

"*Department*" means any department within the Town of Prospect government.

"*Drainage System*" means any structure(s) or facility, including inlets, catch basins, storm drains, underdrains, ditches, channels, culverts, designed and constructed for the removal of storm water from greets, highway sections, parking areas, and other drainage areas.

"*Dry Weather Flows*" means flows that exist within storm sewer systems during dry weather periods experiencing little or no precipitation.

"*EPA*" means the United States Environmental Protection Agency.

"*Facility*" may be defined by the following, but not be limited to buildings, parking lots, highways, roadways and railways.

"*First Flush*" Pollutants deposited on to exposed areas can be dislodged and entrained by the rainfall-runoff process. Usually the stormwater that initially runs off an area will be more polluted than the stormwater that runs off later, after the rainfall has "cleansed" the catchment. The stormwater containing this high initial pollutant load is called the "first flush".

"*Fresh-tidal wetland*" means a tidal wetland with an annual average salinity of less than 0 5 parts per thousand.

"General Permit" means General Permit for Discharges of Stormwater from Small Municipal Storm Sewer Systems

"Grab sample" means an individual sample collected in less than fifteen minutes.

"Guidelines" means the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control as amended, established pursuant to Section 22a-328 of the Connecticut General Statues.

"*Hazardous Substance*" means any substance, other than oil, which, when discharged in any quantities into waters of the U.S., presents an imminent and substantial danger to the public health or welfare, including but not limited to fish, shellfish, wildlife, shorelines and beaches (Section 311 of the CWA); identified by EPA as the pollutants listed under 40 CFR Part 116.

"*High tide line*" means high tide line as defined in Section 22a-359(c) of the Connecticut General Statutes.

"*Illicit Discharge*" means any unpermitted discharge to waters of the state that does not consist entirely of stormwater or uncontaminated groundwater except those discharges identified in Section 3(a)(2) of this general permit when such non-stormwater discharges are not significant contributors of pollution to a discharge from an identified MS4.

"*Individual permit*" means a permit issued to a named permittee under Section 22a-430 subsection (a) of the Connecticut General Statutes.

"*Inland wetland*" means wetlands as that term is defined in Section 22a-38 of the Connecticut General Statutes

.

"*Minimum Control Measure*" means the measures as described by EPA, when implemented in concert, are expected to result in significant reductions of pollutants discharged into receiving waterbodies.

"*Municipal separate storm sewer system (MS4)*" means conveyances for stormwater, including, but not limited to, roads with drainage systems, municipal streets, catch basins, curbs, gutters,

ditches, man-made channels or storm drains owned or operated by any municipality, state or federal institution and discharging directly to surface waters of the state.

"*NBIS*" means the National Bridge Inspection Standards

"*NDDB*" means the Natural Diversity Data Base. This is the central repository for information on the biology, population status and threats to the elements of natural diversity in the state of Connecticut (Refers to CTDEEP)

"*NPDES*" means the National Pollution Discharge Elimination System.

"*Outfall*" means the mechanism or structure by which a storm sewer, storm drain, stream or water course discharges to a receiving water body.

"*Permittee*" means any municipality or any state or federal institution that initiates, creates, originates or maintains a discharge authorized by this general permit and that has filed a registration pursuant to Section 4 of this permit.

"*Point Source*" means any discernible, confined and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged.

"*Pollutants*" means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.

"*PSA*" means Public Service Announcement.

"*Public Water Supply Areas*" means any area that may have the potential to drain and deliver stormwater to any reservoir or storage area which is used for supplying public drinking water.

"*Registrant*" means a municipality, State agency or Federal agency, which files a registration pursuant to Section 4 of the general permit

"*Registration*" means a registration form filed with the Commissioner pursuant to Section 4 of the general permit.

"*Runoff reduction practices*" means those post-construction stormwater management practices used to reduce post-development runoff volume delivered to the receiving water, as defined by retaining volume of runoff from a storm up to the first half inch or one inch or rainfall in accordance with Sections 6(a)(5)(B)(i) or (ii), respectively. Runoff reduction is quantified as the total annual post-development runoff volume reduced through canopy

interception, soil amendments, evaporation, rainfall harvesting, engineered infiltration, extended filtration or evapotranspiration.

"Sanitary Sewer Overflow (SSO)" means a discharge of untreated sanitary wastewater from a municipal sanitary sewer.

"*Small MS4*" means any municipally-owned or –operated MS4 (as defined above) including all those located partially or entirely within an Urbanized Area that have at least 1,000 residents in the Urbanized Area (as determined by the 2000 or 2010 census) and all state- and federally-operated MS4s (except DOT) and any other MS4s located outside an Urbanized Area as may be designed by the Commissioner. (Note: A list of Small MS4 municipalities is included in Appendix A of this general permit. DOT will be authorized under a separate permit)

"Stormwater" means waters consisting of rainfall runoff, including snow or ice melt during a rain event.

"Stormwater Quality Manual" means the Connecticut Stormwater Quality Manual published by the Connecticut Department of Energy & Environmental Protection in 2004, as amended and maintained at http://www.ct.gov/deep/stormwaterqualitymanual

"*Total Maximum Daily Load (TMDL)"* means a water quality implementation plan established pursuant to Section 303 of the federal Clean Water Act.

"*Urbanized Area (UA)"* means that areas of the State of Connecticut so defined by the U.S. Census Bureau for the 2000 or 2010 census.

"Water Quality Standards or Classifications" means those water quality standards or classifications contained in Sections 22a-426-1 through 22a-426-9, inclusive, of the Regulations of Connecticut State Agencies and that Classification Maps adopted pursuant to Section 22a-426 of the Connecticut General Statues, which together constitute the Connecticut Water Quality Standards, as may be amended.

"Water Quality Volume (WQV)" means the volume of runoff generated by one-inch or rainfall on a site as defined in the Connecticut Stormwater Quality Manual.

APPENDIX B

TOWN MAPS

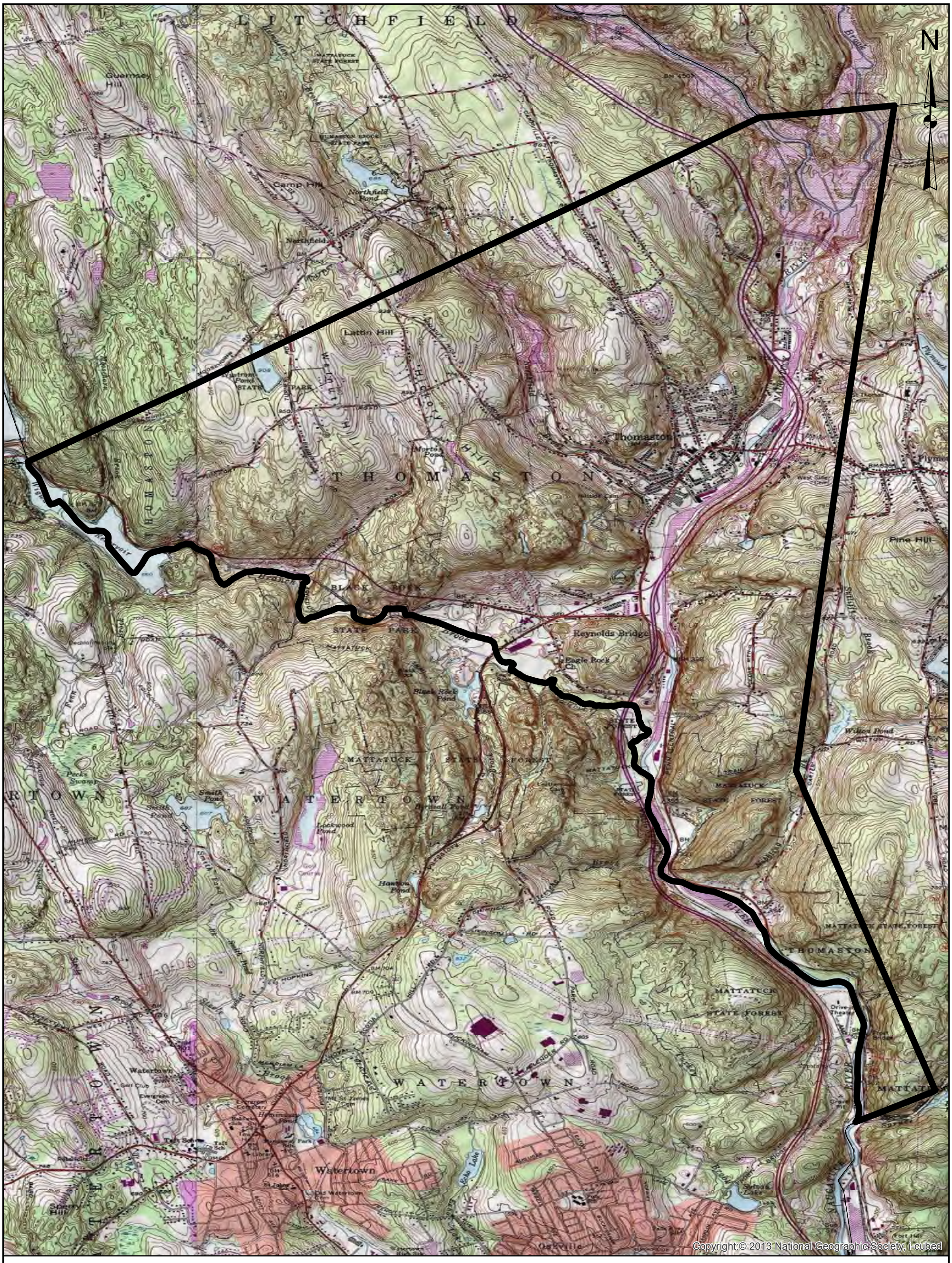


FIGURE 1
USGS MAP - THOMASTON, CT

STORMWATER
MANAGEMENT PLAN
2017

TOWN OF THOMASTON

Legend

TOWN BOUNDARY

0 0.25 0.5 1 1.5 2
Miles

SOURCE: CTDEEP GIS DATA 2014 AND USGS

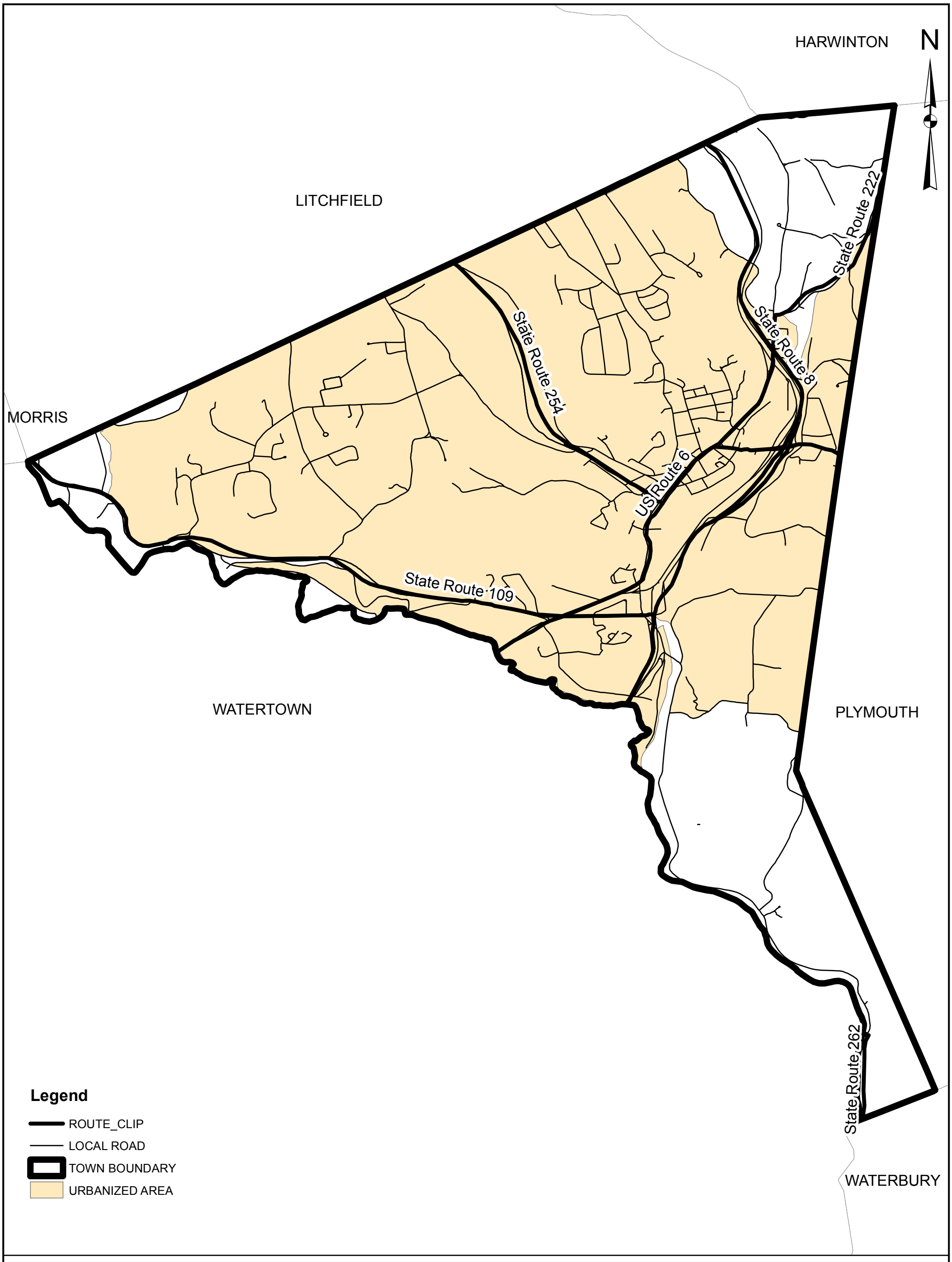


FIGURE 2
URBANIZED AREA

STORMWATER
MANAGEMENT PLAN
2017

TOWN OF THOMASTON

HARWINTON

N

LITCHFIELD

6908-08

6908-00

6909-04

6900-15

6909-01

6909-00

6900-16

MORRIS

6910-10

6910-13

6900-00

6910-00

6900-17

WATERTOWN

PLYMOUTH

6900-20

6900-00

6900-21

WATERBURY

Legend

- WATERCOUSE
- WATERBODY
- TOWN BOUNDARY

BASIN

SUBREGION

- Branch Brook (6910)
- Leadmine Brook (6908)
- Naugatuck River (6900)
- Northfield Brook (6909)

0 0.25 0.5 1 1.5 2 Miles

SOURCE: CTDEEP GIS DATA 2014

FIGURE 3
LOCAL WATERSHEDS

STORMWATER MANAGEMENT PLAN 2017

TOWN OF THOMASTON

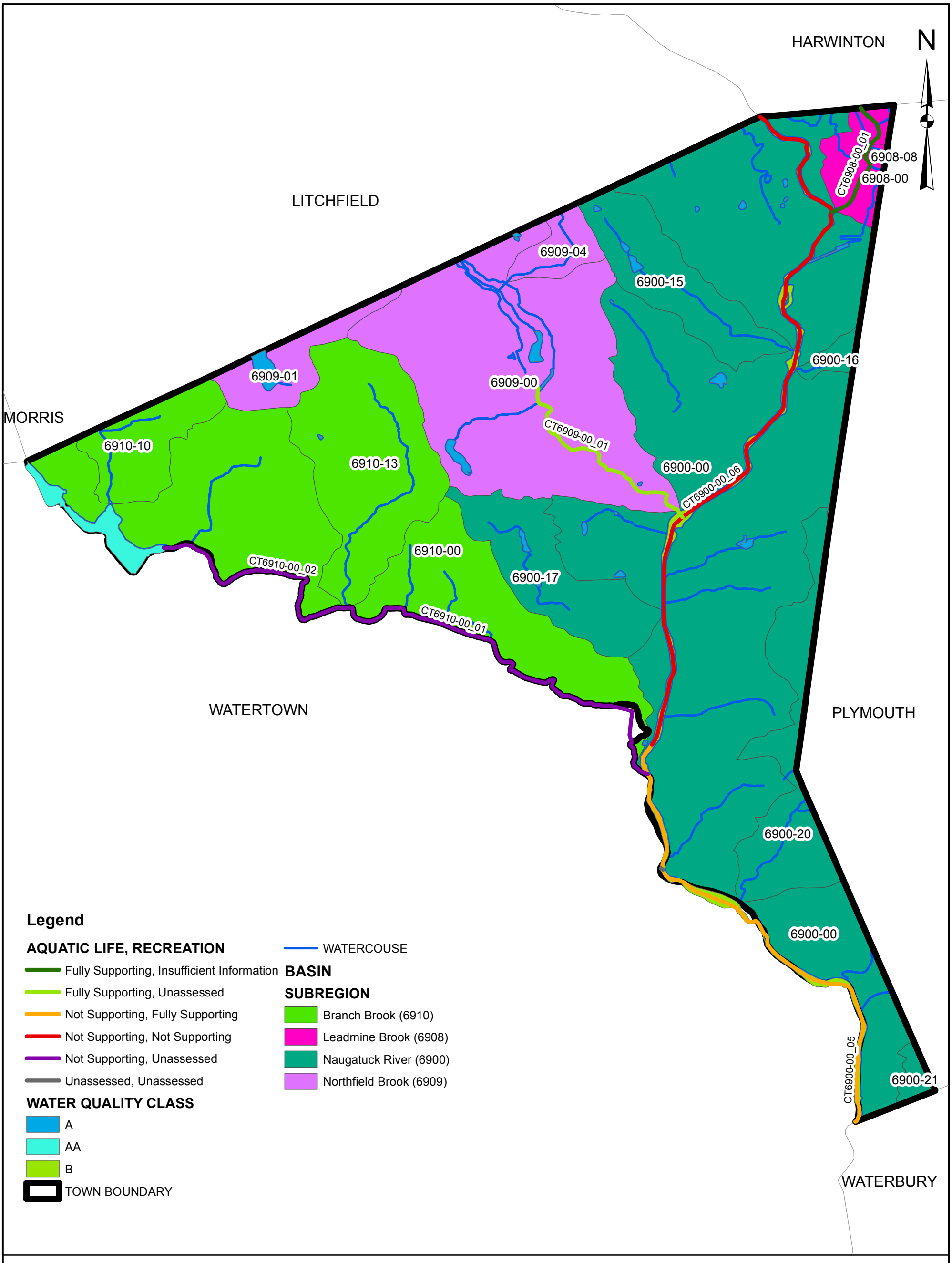


FIGURE 4
WATER QUALITY

STORMWATER
MANAGEMENT PLAN
2017

TOWN OF THOMASTON

SOURCE: CTDEEP GIS DATA 2014

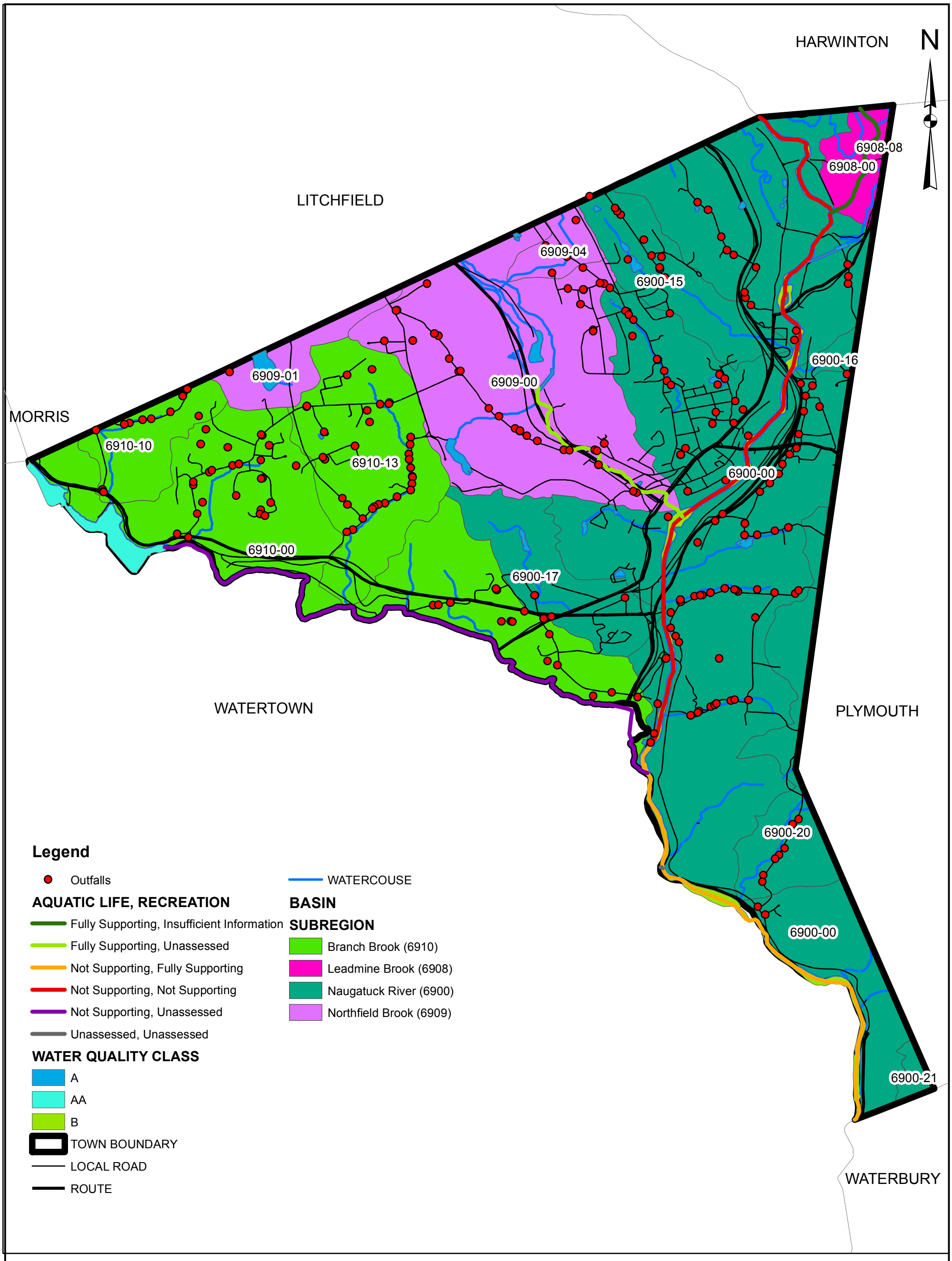


FIGURE 5
WATER QUALITY WITH OUTFALLS

STORMWATER
MANAGEMENT PLAN
2017

TOWN OF THOMASTON

SOURCE: CTDEEP GIS DATA 2014

N

84
85
140
138
139
250
24
23
22
8
21
20
5
4
48

Legend

Outfalls to Sample
Outfalls
WATERCOUSE
TOWN BOUNDARY
LOCAL ROAD
ROUTE

0 0.125 0.25 0.5 0.75 1
Miles

SOURCE: CTDEEP GIS DATA 2014

FIGURE 6
OUTFALLS TO SAMPLE

STORMWATER
MANAGEMENT PLAN
2017

TOWN OF THOMASTON

TOWN OF THOMASTON CONNECTICUT

APPENDIX C

REFERENCE MATERIAL

RIVER BANKS & BUFFERS

Backyard Buffers

No. 2

for the Connecticut River Watershed

That river or stream in your back yard is telling you something. It's reminding you that humans aren't the only ones who prefer riverfront property. You might be sharing it with kingfishers, trout, salamanders, or otters. You're also responsible for whether the water is better or worse off when it leaves your land.

THE REASON FOR CONCERN

The backyard buffer: boundary between the natural and man-made worlds.

Riparian buffers (streamside plants) link the land and the water together. Whether your waterfront slice of the 11,720 square mile Connecticut River watershed is a large river or a small, intermittent creek, the water is affected by what happens on your home turf. In fact, we are all riverfront landowners because we live in a watershed — even that storm drain at the bottom of your driveway or street eventually leads to a waterway.

The bad news is that a residential neighborhood can be a major source of pollution. Water flowing over roads, lawns, and yards picks up sediments, lawn fertilizers, pesticides, herbicides, heavy metals, and other pollutants that people don't want in their waterways. Americans have long loved the park with its neatly trimmed grass. But disturbing the riverfront to expand a lawn, create a view, or build a boat landing invites these troubles:

- **erosion**: cutting riverbank vegetation destabilizes the shoreline and can lead to loss of land. The area between the water's edge and the top of the bank must stand up to scouring currents, fluctuating water levels, moving ice, flooding, surface runoff from higher ground, and, on a large river, boat wakes and wind-driven waves.
- **flooding**: land development increases runoff from impervious surfaces such as roofs, roads, sidewalks, and parking lots. Rainwater can run off lawns twice as fast as from forests. More water reaches the stream faster than it would naturally, causing it to flood during heavy rains and run low or even dry out during dry spells.
- **water damage**: building structures within the riparian area places them in harm's way.
- **unsightly algae blooms**: just as fertilizers make your lawn green, they make your river green by feeding algae and aquatic weeds.
- **damage to fisheries**: clearing trees exposes waters to more sunlight, raising water temperatures and stressing fish and their food supplies.
- **loss of habitat**: the river's edge is prime real estate for birds and other wildlife. Backyard bird feeders are no substitute for good plant cover and natural food.
- **loss of privacy**: thirty years of pollution control have given us clean rivers to enjoy once again. The Connecticut River and its tributaries have been discovered by boaters, anglers, water skiers, jetskiers, and swimmers. Shoreline vegetation screens homes from public view and helps reduce noise from boats on the water.

Understand the risks involved in building or living near a river.

BUFFER BENEFITS

The good news is that plants protect your property by slowing runoff and allowing it to soak into the ground, recharging wells and reducing flooding. Roots help hold the soil and control erosion. Trees cast their shade over the water to keep it cool for fish and frogs, and provide perching places for birds. Buffer plants can provide seasonal blooms and autumn color to beautify your yard while attracting butterflies and birds.

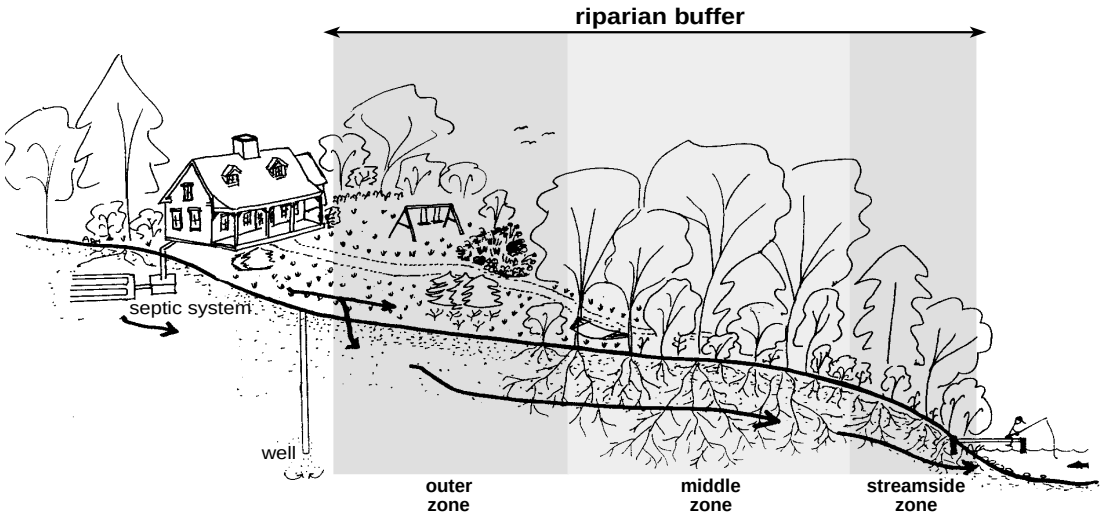
Permanent vegetation along your streambank provides a "living filter" for both surface and subsurface water running off the land, while providing your home landscape with privacy and the pleasure of watchable wildlife.

The flood and erosion "insurance" provided by a riparian buffer is all the more important now that weather patterns are taking a turn. Whether global climate warming is natural or human-induced, New England is seeing a definite shift toward heavy storms that deliver several inches of rain in a single day. Sturdy plantings on your streambank are the best protection you can provide for your own property and your neighbors.

No stream is too small to benefit from a buffer. In fact, the smaller the stream, the more your buffer will help. It is those many little streams that make up the mighty Connecticut.

ANATOMY OF A RIPARIAN BUFFER

Use the description below as a general guide which can be altered to fit the available space between the river and your home. Every bit of buffer counts. Even a 50' buffer is better than no buffer at all. (See *Introduction to Riparian Buffers*, No. 1 in this series, for more on buffer width.)



A THREE ZONE BUFFER SYSTEM — the most effective backyard buffer has three zones:

- **streamside**: from the water to the top of the bank. Protects the bank and offers habitat. The best buffer has mature forest but large shrubs may be a better choice where trees have collapsed a bank. Let it grow and let it go for the best protection.
- **middle zone**: from the top of the bank inland. Protects stream water quality and offers habitat. Varies in width depending on size of stream and the slope and use of nearby land. The best buffer has trees, shrubs, and perennial ground plants. It can allow some clearing for recreational use.
- **outer zone**: the yard, garden, or woods between your home and the rest of the buffer. Traps sediment; play areas, gardens, compost piles, and other common residential activities are suitable here.

A buffer is a right-of-way for a stream.

BEGINNING YOUR BUFFER

First Steps

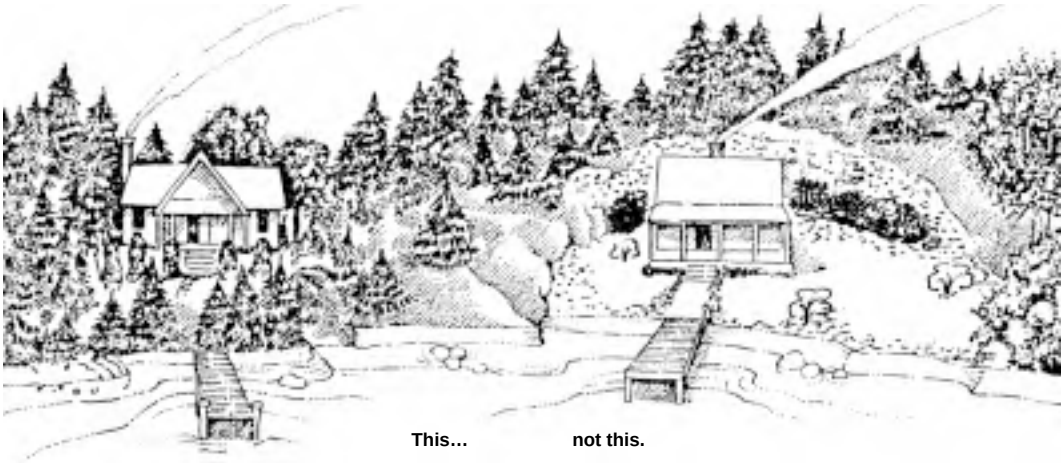
Spend some time outside during a heavy rainstorm, watching your property to see where the water goes. Your buffer does the best job of filtering runoff when the water spreads out and does not flow straight to the stream in a channel. Regrade, or use stones or landscape timbers to divert runoff into flatter areas where it can soak in. If your land receives stormwater runoff from a road, an engineer's advice is useful.

If you have an unstable bank, deal with this first. Consult *The Challenge of Erosion in the Connecticut River Watershed*, published by the Connecticut River Joint Commissions. Remember that a buffer will provide good insurance for your riverbank. Your county Conservation District office has an inventory of erosion sites on the Connecticut River mainstem.

Protect a natural buffer from clearing.

Choose building sites wisely: protect your property and the river by not building in the river's flood plain. Streamside land is a high risk area for development even above flood elevation, since a river channel may not stay where you wish it would. Don't be fooled into thinking that you can dramatically change a natural shoreland to fit your desires. *Be certain to get a permit before starting any work on a riverbank or in a wetland.*

The first goal is to avoid planting a lawn to the water's edge. This is the worst and most common mistake homeowners make in setting up housekeeping next to water. Lawns have no habitat value (except for mice and moles). They put your property at risk for erosion, and deliver lawn chemicals directly to the stream, to say nothing of ruining the fishing. You don't have to return your entire yard to a natural forest to protect a stream, however. A lawn nearer your house can work as part of your riparian buffer, by soaking up runoff and catching sediment from driveways and bare ground.



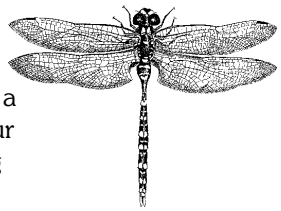
This... not this.

If You Have a Lawn to the Water's Edge

You can begin a buffer by starting a wildflower meadow on the water side of your lawn. Create islands of unmown areas around the edges of the lawn. Seed these with wildflowers, and mow around them if you want a tidier look. Eventually allow these wildflower islands to expand until they create a continuous garden by the water. Keeping grass at a height of 2½-3" encourages deeper rooting to withstand heat and drought. You can create an appealing riverfront garden landscape while eliminating time-consuming lawn care and watering. Even in water-rich New England, as much as 70% of summer water use is for lawns.

The no-mow option is the least expensive and the easiest; the lawn will gradually become a meadow, shrubs will move in, and then trees. If you want to keep part of your yard as a wildflower meadow, mow once every two to three years, except along the immediate streambank.

You can also encourage your meadow to fill in with trees and shrubs, by letting the birds plant them for you. Don't mow, and plant one or two berry-bearing shrubs or trees. This attracts the birds to perch in your yard and distribute seeds through their droppings. Of course, you can speed the process up by planting more nursery-grown plants.



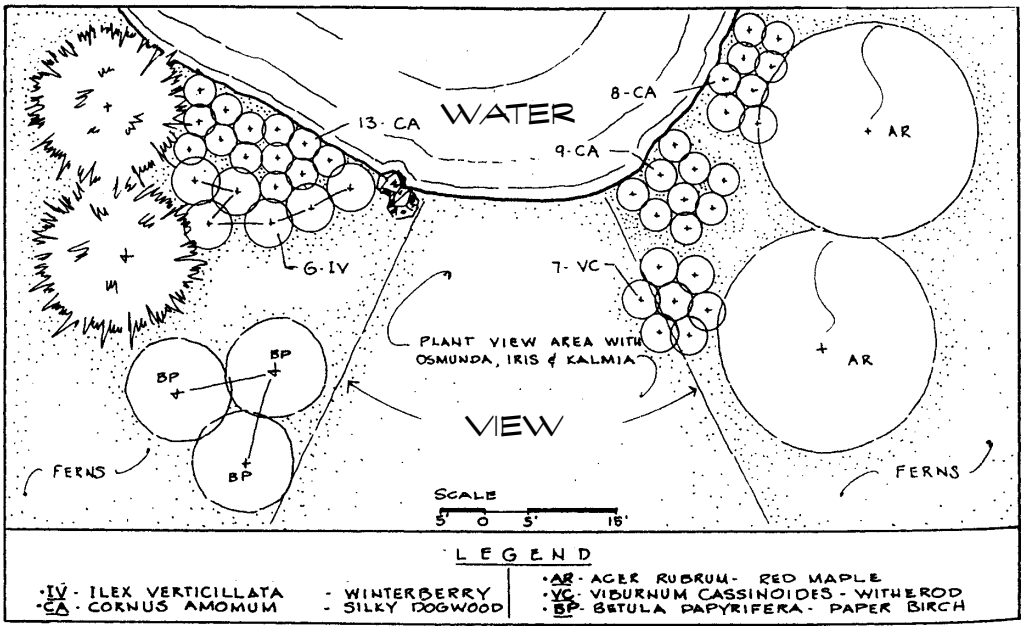
If Natural Vegetation Remains

Consider retaining the natural beauty of a wooded shoreline. You might like the way a natural buffer looks — a carefree collection of native plants. If that's what you have, your best option is to let nature alone. If large trees block your view, consider careful pruning rather than removal. You can always cut a tree later, but it takes decades to replace a mature tree, and its root system is better at removing pollutants. Keep heavy equipment at least 25' from trees you wish to save, and avoid changing the grade around their roots.

Access to the Water

Frame your view of the river or stream with plants that add to your property value, or by careful pruning. If foot access to the stream is important, lay out a curved path and plant around it. Grade the path if necessary to keep it from becoming a tiny stream

channel during rainstorms. Slopes over 15% require constructing steps or stairs. Try to keep children and pets on this path to discourage them from trampling the rest of the riverbank. Choose fence locations with equal care - fences built on flood plains near the water have a bad habit of catching ice floes and debris. If you have a dock, sturdy shoreline vegetation will help protect your riverbank from the wake of your boat.



Select Native Plants

Native plants need less help from you so you can spend more time in the hammock.

Native plants are far better for buffers than exotic ones. Many trees, shrubs, and herbaceous perennials used in conventional landscape plantings are non-native species from Europe or Asia. A number have escaped from cultivation to become pests. Their novelty can also attract nuisance wildlife. Aggressive exotics such as purple loosestrife and glossy buckthorn can overwhelm native plants and turn your yard into a virtual desert where wildlife is concerned. You don't have to settle for a dull buffer, however. Many native plants are particularly attractive, with showy flowers, berries, branching habits, and autumn color. The buffer is also a good place to grow the family's Christmas trees.

Visit some nearby natural areas to see what grows there. You're better off copying Mother Nature: these plants have proven their ability to survive there with no care. They're resistant to most diseases and insects, are adapted to the local climate, and they're what wildlife expect to find. Sheet No. 8 in this series identifies native plants with ornamental value and those that attract birds, butterflies, or other desirable wildlife.

Since the backyard buffer forms the boundary between the natural and man-made worlds, the most successful streamside planting design aims for a less manicured look than one might expect on the street side of the home landscape. Group plants in odd-numbered clusters and repeat plants across the waterfront for a naturalistic effect.

Do not try to transplant wildflowers from the wild — it often fails and is illegal without the landowner's permission. Purchase nursery-grown wildflowers from a responsible supplier.

THE BETTER BUFFER

Copy Mother Nature.

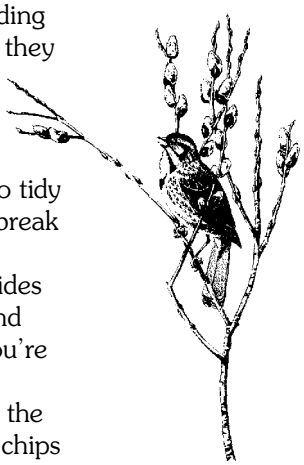
The best safeguard for water quality, both in the river and in your well, is a woodland. A variety of trees and shrubs will do the best job of filtering runoff and providing habitat diversity for wildlife.

The bigger the buffer, the better. Trout streams, those used for water sports, and sources of drinking water need the most protection. You need a wider buffer if you have a lawn, landscaped area or garden where fertilizers and pesticides are used, or if there are parking lots, roads, or hillsides sending runoff through your yard into the stream.

Add buffers between your house and the street to filter runoff before it enters a storm drain or ditch on its way to a river. Another good place for buffers is along a parking area or drive-

way, where they can be disguised as perennial flower beds, shrub borders, or fern gardens.

Trees planted on the south or west side of your stream will do the best job of shading and cooling its waters for fish. Trees cannot entirely shade rivers wider than 75', but they can still help hold the soil, filter runoff, and provide habitat.



CARING FOR YOUR BUFFER

The best care is the least care when it comes to a stream buffer. Resist the urge to tidy up. A natural forest floor, with its "litter" of fallen leaves and twigs, helps the buffer break down pollutants and soak up water. Raking or removing them defeats its purpose.

Fish appreciate natural woody debris which falls into their stream because it provides hiding places and creates resting pools. Remove only debris that could form dams and cause inundation. If a large tree threatens to fall from a steep bank, cut the tree if you're concerned that it will pull the riverbank with it, but leave the root system in place.

Mulch with pine needles or bark chips on high visibility areas if you wish, and leave the rest alone or shield the forest floor with ferns or other herbaceous plants. Fresh wood chips should compost six to twelve months before use. Cedar and redwood bark mulch are not recommended for stream buffers because their chemistry interferes with neutralizing nutrients and other pollutants. If you must fertilize near the water, use only lime or wood ash.

Mowing and removing clippings from a lawn on the land edge of the buffer helps recycle nutrients it has captured and promote vigorous sod growth. Watch your buffer for signs of erosion or channeled runoff. Keep pet droppings from washing into the stream.

Remember that Nature will probably rearrange your efforts to some degree, and that as the buffer grows, natural succession will replace shorter-lived plants with more shade tolerant, long-lived plants.

WHAT ABOUT COST?

It's hard to put a dollar figure on your time behind a lawnmower or the value of watching wildlife. Here are some of the costs and benefits involved in adding a buffer to your backyard.

Costs

- wildflower seed
- plant material: use cuttings or bare root plants from a native source; nursery grown plants are more expensive but more reliable
- mulch; pine needles can be gathered and highway crews can supply chips for free
- labor in planting
- labor in mowing: once/year for meadows

Benefits

- less time spent mowing lawn and maintaining yard
- less money spent on fertilizer, pesticides, herbicides, fuel, equipment maintenance
- reduced air conditioning costs if house is shaded by buffer plants
- reduced heating costs if buffer plants provide winter windbreak
- more stable shoreline: avoid costs of engineering design, permits, bank stabilization
- more interesting birds, butterflies, and wildlife to watch
- better fishing
- cleaner, safer, more attractive water for recreation
- source of decorations — Christmas trees, miniature alder cones, grape vines for wreaths, flowers, fall foliage
- safer, more reliable drinking water from on-site well
- better flood protection
- possible tax benefits from conservation easement on buffer
- increased general property value

Blue-flag iris, *Iris versicolor.*

KNOW STATE AND LOCAL REGULATIONS

Since buffers are amongthe very best means for protecting rivers and streams, state and local authorities protect buffers in several ways. In both Vermont and New Hampshire, septic systems must be set back 75' from rivers and streams. Many towns also have their own local zoning ordinances for buffers and setbacks from surface waters. Some require buffers of a standard width, and others prescribe a range and assign a width appropriate to the site.

In New Hampshire, the Comprehensive Shoreland Protection Act (RSA 483-B) protects existing natural woodland buffers within 150' of the public boundary line on all 4th order streams, including lower portions of the Ashuelot, Ammonoosuc, Cold, Gale, Israel, Mascoma, Mohawk, Sugar, Little Sugar, and Upper Ammonoosuc Rivers, and Mink, Partridge, and Stocker Brooks. On these waterways, not more than 50% of the basal area of trees and a maximum of 50% of the total number of saplings can be removed in a 20 year period. A healthy, well-distributed stand of trees, saplings, shrubs, and ground covers and their living, undamaged root systems must be left in place. While the Connecticut River mainstem was exempt from the Comprehensive Shoreland Protection Act at the time of printing, some riverfront towns have adopted its provisions, and the law may apply to the rest in the future. If you are unsure what laws apply to your riverfront property, contact your town office.

MORE ON MANAGING THE HOME LANDSCAPE

The Homeowner's Guide to Nonpoint Source Pollution in the Connecticut River Valley, CRJC 1994. Available from the Connecticut River Joint Commissions or on the web at [www.crjc.org/pdffiles/homeguide.pdf]

A Guide to Developing and Re-Developing Shoreland Property in New Hampshire, North Country Resource Conservation & Development Area. 1999.

Native Vegetation for Lakeshores, Streamsides, and Wetland Buffers, Vermont Department of Environmental Conservation. 1994.

Wildlife and plant illustrations courtesy of David M. Carroll, NH author and naturalist.
Final drawing by Susan Berry Langsten, NH artist.

Fact sheets in the series *Riparian Buffers for the Connecticut River Watershed*

No. 1 Introduction to Riparian Buffers
No. 2 Backyard Buffers
No. 3 Forestland Buffers
No. 4 Buffers for Habitat
No. 5 Buffers for Agricultural Land
No. 6 Urban Buffers
No. 7 Guidance for Communities
No. 8 Planting Riparian Buffers (& plant list)
No. 9 Field Assessment
No. 10 Sources of Assistance

See also the companion series for land owners:
The Challenge of Erosion in the Connecticut River Valley, Connecticut River Joint Commissions, 1998.

Part of the ***Living with the River*** series. May be reprinted without permission.
Riparian Buffers for the Connecticut River Watershed was prepared by the Connecticut River Joint Commissions of NH & VT with support from the Silvio O. Conte National Fish & Wildlife Refuge Challenge Cost Share Program, PG&E National Energy Group, NH Dept. of Environmental Services, and EPA. Technical assistance was provided by UNH Cooperative Extension Service, USDA Natural Resources Conservation Service, VT Dept. of Environmental Conservation, Connecticut River Conservation District Coalition, Upper Valley Land Trust, Environmental Protection Agency, Appalachian Mountain Club, NH Dept. of Environmental Services, US Fish & Wildlife Service, PG&E National Energy Group, CRJC river commissioners and local river subcommittee members. September 2000

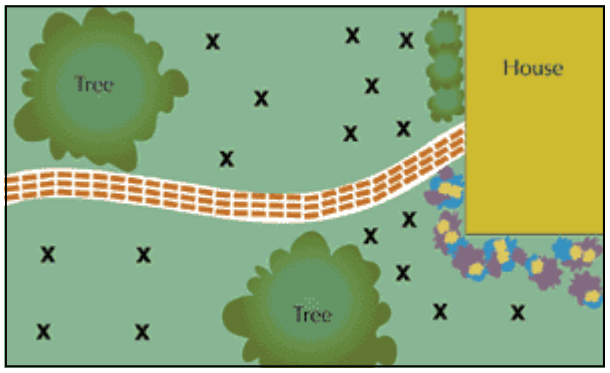
CONNECTICUT RIVER JOINT COMMISSIONS INC

PO Box 1182 • Charlestown NH 03603 • 603-826-4800 • WWW.CRJC.ORG

How to De-Grub Your Lawn... ...Organically

Monitor for White Grub Populations in Mid-August

- White Grubs damage turf by chewing off roots close to the soil's surface. Major damage is inflicted during drought conditions in late August through the fall months. By sampling in mid-August you will get a chance to survey grubs before they start to voraciously consume your lawn.
- Adult beetles lay eggs in sunny, well-managed & well-watered lawns. This is the area you should focus on for your sampling survey.
- To sample for grubs, cut a foot square piece of your lawn and sample to three inches deep. Record #'s of grubs and species. (see pg. two for a guide to grub species)
- Grubs can be damaging in a range of 6-10 grubs per sq ft.



Sample on an grid so you can determine population size. *Illustration by Karen English*

Organic Grub Treatments

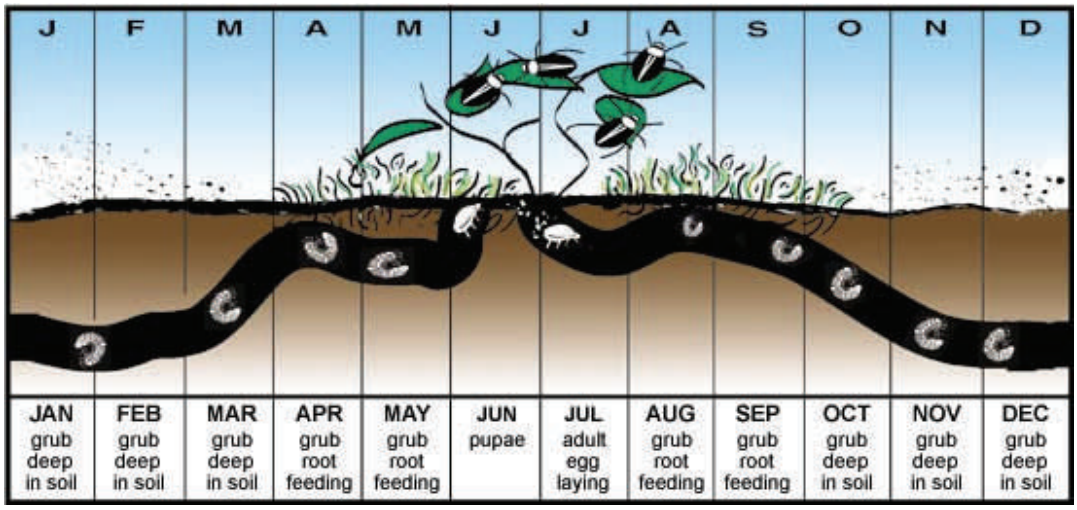
- **Milky spore©** is a natural way to control Japanese Beetles and other grub species. Apply to your lawn mid-August to September.
- There are **Insect Parasitic Nematodes** that can be applied to your lawn that will attack certain varieties of grubs. Once you survey what types of grubs you have you can then go to a local gardening store to purchase various types of Insect Parasitic Nematodes.
- Apply these treatments to your lawn in mid-August to September will be most effective in killing grubs before they start to devour your lawn.
- Both Milky Spore and Insect Parasitic Nematodes are available at local gardening shops. Call before you go. If you have trouble locating a shop, go to www.ctnofa.org to find a local purveyor.

Keeping Your Lawn Free of Grub Damage

- **Plant the right grass:** Plant grasses that have deeper root systems, and resistance to heat and drought. Tall Fescue is known to be the most tolerant followed by Kentucky Bluegrass, Fine Fescue and Perennial Rye Grass
- **Keep your lawn on a 'water diet' during adult beetle activity:** Over-watering during adult beetle activity in summer will attract egg-laying females, especially if surrounding lawns are dryer. Your lawn should be able to survive on one inch of water a week (including rain water). An appropriately irrigated lawn will be more tolerant of feeding grubs.
- **Are beetle traps right for you?** Beetle Traps actually increase and attract larger numbers of females which then feed on surrounding foliage. Traps work better over larger land areas, such as a neighborhood. Get your neighbors involved if it is a regional problem.
- **Focus on Biodiversity:** Ants, parasitic wasps and flies are natural predators of grubs. Keeping your lawn full of flowering plants attracts many different kind of insects.
- **Don't Use Pesticides:** Keeping your lawn free of broad-spectrum pesticides will result in a lawn thriving with beneficial insects that may be natural predators to beetles & grubs.

Grub Life Cycle - A Story

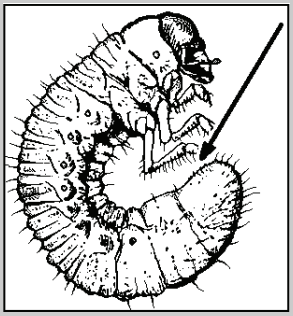
White grubs are the lawn-damaging larvae of a large group of beetles called scarabs. Both as adults and as grubs (the larval stage), scarab beetles are destructive plant pests. Adults feed on the foliage and fruits of several hundred species of fruit trees, ornamental trees, shrubs, vines, and field and vegetable crops. Adults leave behind skeletonized leaves and large, irregular holes in leaves. The grubs develop in the soil, feeding on the roots of various plants and grasses and often destroying turf in lawns, parks, golf courses, and pastures.



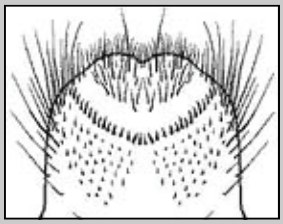
In June and July, adult beetles emerge from the soil to feed on flowering plants, fruit trees and other vegetation. After mating, they lay their eggs just below the soil. The eggs go through three stages before they emerge from the soil and start the cycle all over again. The first two stages, from egg to 1st stage and 1st stage to 2nd stage, each last nearly three weeks. These stages are when the larvae, now known as grubs, are feeding the most and, if combined with summer drought weather, is when your lawn will show the most damage. The 3rd stage grub moves deeper in the soil once the weather gets cooler and will emerge from the soil in the following summer.

Know Your Grubs:

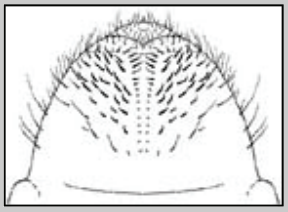
Most grub species can be determined by their raster, located on the underside of their abdomen. (see image at right) A 10x to 15x hand lens will help you to identify which grubs are chewing your lawn.



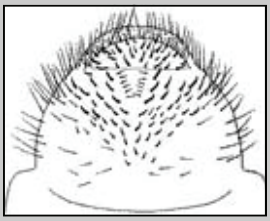
Asiatic Garden Beetle:
Crescent shaped raster. Adult beetles are a velvety brown and 1/4 inch long. They feed at night. Can be controlled with heterorhabditis nematodes.



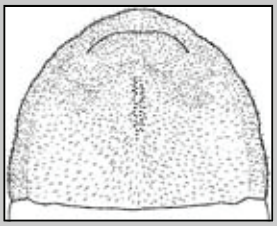
European Chafer Beetle:
"Y" shaped raster. Adults are a reddish-brown with darker head, ½ inch long. Can be controlled with heterorhabditis nematodes.



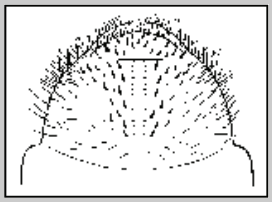
Japanese Beetle :
"V" shaped raster. Adult beetles are metallic green with copper colored wings and ½ inch long. Can be easily controlled with milky disease.



Green June Beetle:
Crescent shaped raster. Adults are velvety green and dull brown and can be 1-inch long. Insect parasitic nematodes steinernema and heterorhabditis can control them.



Oriental Beetle:
"Parallel" shaped raster. Adults are a metallic green with copper colored wing covers and ½ inch long. Can be controlled with nematodes steinernema and heterorhabditis



Thanks to the *NOFA Organic Lawn & Turf Handbook* for all the information on Grubs, species and life cycles.

What's Happening to the Water Cycle?

As we develop our land and increase the amount of paved surfaces and buildings, known as impervious cover, the water cycle is changed. Less rainfall and snowmelt sinks into the ground and more water flows rapidly over the land into our lakes, rivers and estuaries. Stormwater runoff can lead to increased flooding, erosion, pollution and decreased groundwater recharge during dry periods.

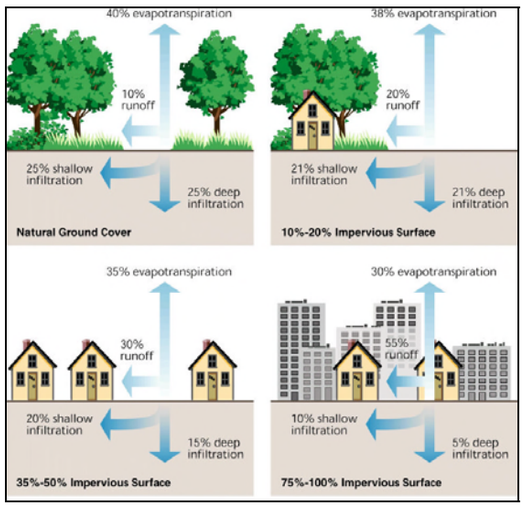


Photo: FISRWG

As impervious surfaces increase, the problems associated with stormwater also increase. Stormwater can contain pollutants such as sediment, nutrients, bacteria and chemicals that can threaten aquatic health, and contribute to the loss of water dependent recreational activities. Stormwater is recognized nationally as the leading cause of water pollution today.

Conventional methods of land development collect and convey stormwater quickly into a series of drains and pipes that flow directly into the closest waterbody with little or no water quality treatment.

How can we fix it? LID!

Low Impact Development (LID) techniques manage stormwater runoff by imitating the natural movement of water in the environment. LID decreases the volume of runoff and improves water quality by infiltrating, filtering, storing and evaporating stormwater. LID transforms stormwater from a nuisance that must be disposed of quickly into an asset that nourishes ground water resources. Ground water is an important source of drinking water supply, and also helps to maintain stream flow during critical dry weather periods when fish and aquatic life are most vulnerable.

The primary goals of LID are to:

- Manage and treat stormwater starting at its source and at multiple locations throughout the landscape
- Protect natural systems and processes (water movement, vegetation, native soils, sensitive/important features)
- Incorporate natural features (wetlands, stream corridors, mature forests) as design features into development plans
- Re-evaluate the cost and use of traditional building techniques and infrastructure (lots, streets, curbs, sidewalks, storm drains)
- Preserve open space and minimize land disturbance

LID techniques can be utilized both within your community and around your home. Practices can be applied singly or in a sequence. When multiple techniques are grouped together, water quality and quantity benefits are maximized.

Low Impact Development Practices

Rain Barrels – Low cost collection devices connected to your downspout that store roof runoff for later use. Using rain water for watering plants or washing your car can lower your water bill and decrease demand during times of drought.

Rain Gardens – Also called bio-retention areas, are depressed perennial or shrub gardens with both water and drought-tolerant plants. Rain gardens manage runoff by collecting rain water from rooftops and lawns into the garden, where it can infiltrate into the ground. Rain gardens are designed to hold water for only a few hours after a storm, so there is limited opportunity for mosquitoes to breed.

Swales – Broad, shallow channels planted with dense vegetation along roads, driveways and parking lots. Properly designed and maintained swales can trap pollutants, increase groundwater recharge and slow the flow of runoff, reducing erosion.

Buffers – Natural or landscaped areas used to separate a body of water from an area of intensive land use, preventing sediment and other pollutants from reaching the water.

Photo: US FHWA

Permeable Pavements – Surfacing materials such as gravels, concrete pavers, and porous asphalt/ concrete which allow rainwater and runoff to infiltrate into the ground, instead of running into the storm drain.

GreenRoofs – Engineered systems of soil and plants that detain, absorb and filter rain, and reduce the volume of roof runoff. Green roofs may be applied to many existing flat roofs and new construction. Some green roof companies will work with a homeowner to supply a "do-it-yourself" kit that is appropriate for a residence.

Photo: UCONN NEMO

Narrowed Roads – Reduce runoff by decreasing the amount of paved area. This will increase infiltration into the ground and decrease the volume of water sent into the storm sewer system. These roads also calm traffic and can add to neighborhood aesthetics.

Photo: City of Seattle, WA

Low Impact Development and You

Every resident can promote the use of LID in their community. Ways that you can be proactive include:

- Incorporate one or more LID practices in your own yard
- Educate others in your neighborhood about the benefits of LID
- Encourage your municipal officials to implement LID demonstration projects in public areas
- Promote discussion of community-wide LID goals
- Participate with your local government to amend existing zoning and/or subdivision regulations to allow the use of LID

All LID features require some maintenance to work properly over their lifespan, but are often less work than traditional landscaping practices.

Low Impact Development Working for You

A number of Connecticut communities are starting to use LID practices. Shown below is a drainage swale created along a busy road in Wallingford designed to capture and filter runoff before it enters a local lake.

Photos: USDA NRCS

The Benefits of Low Impact Development

For Your Town:

- Can preserve features that are important to a town's character
- Helps balance the need for growth with environmental protection
- Reduces the costs of infrastructure maintenance (streets, curbs, sidewalks, storm drains)
- Slows/calms traffic and provides an attractive and pleasing environment for residents through narrower streets and street side plantings
- Can be applied to residential, commercial and even industrial properties
- Is consistent with environmental responsibility while increasing marketability.

For Your Environment:

- Helps maintain the natural hydrology of the site and the health of our surface and ground water supplies
- Preserves the ecological and biological balance of the natural system
- Protects water quality by reducing sediments, nutrients, and other pollutants
- Preserves trees and other natural vegetation
- Provides habitat for wildlife

Want to Know More? Click to Explore!

UCONN's Nonpoint Education for Municipal Officials (NEMO) website provides tools, resources, publications and more:
www.nemo.uconn.edu

For NEMO's LID elements, site design and more:
http://nemo.uconn.edu/tools/stormwater/index.htm

For NEMO's guide to building a rain garden:
http://www.nemo.uconn.edu/tools/publications.htm

The USDA Natural Resource Conservation Service has information about rain gardens at:
http://www.ct.nrcs.usda.gov/eln-educational_materials.html

Jordan Cove Urban Watershed Project discusses the creation of a LID neighborhood in CT:
http://jordancove.uconn.edu/

The CT DEP Stormwater Quality Manual provides guidance on including LID in development:
www.ct.gov/dep/stormwater

Boston Metropolitan Area Planning Council, LID Toolkit provides information and resources:
http://www.mapc.org/LID.html

U.S. EPA LID website offers information:
http://www.epa.gov/owow/nps/lid/

First Brochure of the LID Series

For more information contact CT DEP's Watershed Management Program:
Jessica Morgan - LID Coordinator
jessica.morgan@ct.gov
860-418-5994
http://www.ct.gov/dep/watershed

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Rainfall as a Resource

A Resident's Guide to Low Impact Development In Connecticut

This neighborhood in Waterford, CT was constructed using multiple Low Impact Development techniques. Photo: Jordan Cove Urban Watershed Project, UCONN.

Connecticut Department of Environmental Protection
Bureau of Water Protection and Land Reuse
Planning and Standards Division
79 Elm Street, Hartford, Connecticut 06106

What's Happening to the Water Cycle?

As we develop our land and increase the amount of paved surfaces and buildings (known as impervious cover), the water cycle is changed. Less rainfall and snowmelt sinks into the ground and more water flows rapidly over the land into our lakes, rivers and estuaries. Stormwater runoff can lead to increased flooding, erosion and pollution and decreased groundwater recharge during dry periods.

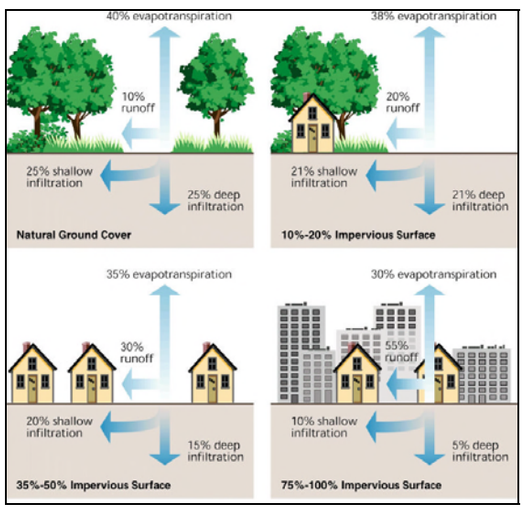

Photo: FISRWG

As impervious surfaces increase, the problems associated with stormwater quality also increase. Stormwater can contain pollutants such as sediment, nutrients, bacteria and chemicals that can threaten aquatic health, and contribute to the loss of water dependent recreational activities. Unmanaged stormwater is recognized nationally as the leading cause of water pollution today.

Conventional methods of land development collect and convey stormwater quickly into a series of drains and pipes that flow directly into the closest waterbody with little or no water quality treatment.

How can we help? Consider Pervious Pavement!

Low Impact Development (LID) techniques manage stormwater runoff by mimicking the natural movement of water in the environment. A great way to recharge groundwater resources, decrease the volume of stormwater runoff, and improve water quality is to consider **INSTALLING A PERVIOUS PAVEMENT** patio, walkway, or driveway. Pervious pavements are designed to allow water to percolate through the pavement into the ground. Installing pervious pavement is an easy way to make your home environmentally friendly!

Why Pervious Pavement?

Installing pervious pavement can reduce the amount of stormwater runoff and improve water quality in your community. Infiltrating stormwater runoff through pervious pavement can help to:

Photo: CT DEP

- Filter nonpoint source pollutants from paved areas and prevent them from flowing into nearby waterways
- Recharge local groundwater resources
- Protect rivers and streams from erosion
- Help to control local flooding
- Help to reduce the need for sewer upgrades by reducing the amount of stormwater entering sanitary sewer lines

Pervious pavements can be used for a variety of purposes including driveways, patios, sidewalks, roads, and parking areas. The type of product should be chosen by the intensity and frequency of use the area will receive.

What is Pervious Pavement?

Pervious pavements allow precipitation to infiltrate on site, close to where it falls. These products are part of an engineered stormwater system and should be professionally installed.

Pervious concrete and **pervious asphalt** have compositions similar to traditional pavement, without the fine particles. This creates open areas in the mixture that allow water to drain through the material and into the ground. These products can be used in most of the same areas as traditional concrete and asphalt but should be avoided in areas with high sediment loads, such as soil or mulch storage areas.

Photo: CT DEP

Concrete block pavers and **concrete grid pavers** are not permeable materials but contain spaces in between the blocks or grids to allow for infiltration. These pavers are best used for parking areas, driveways, patios, and sidewalks.

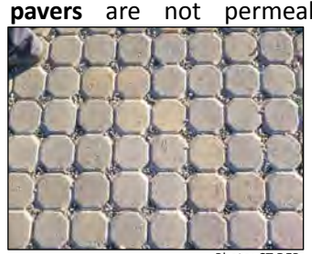

Photo: CT DEP

Plastic grid pavers contain void areas for grass or gravel, which allow water to infiltrate into the soil, while still providing support for vehicles. Often made from recycled materials, these pavers are best used for overflow parking lots, pathways, and driveways.

Photo: CT DEP

How Pervious Pavements Work

Pervious pavements require an engineered subsurface to allow for adequate infiltration into the ground. A typical installation includes an uncompacted subsurface recharge bed overlaid by the pervious product. In order to function properly, appropriate soil types are necessary beneath the recharge bed and the groundwater table needs to be deep enough to allow for infiltration. Environmental conditions may restrict the use of pervious pavements in certain areas so it is recommended that they be professionally designed and installed.

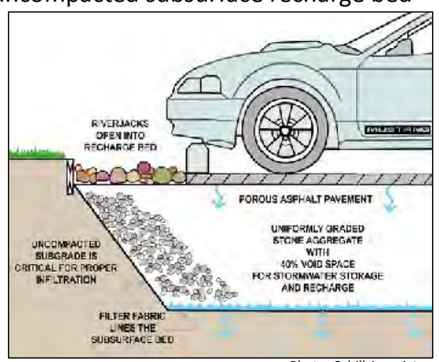

Photo: Cahill Associates

Residential Options for Pervious Pavement Projects

Permeable pavements are a great option for many residential projects including:

- Driveways
- Walkways
- Patios
- Sidewalks
- Shoulder parking
- Pool areas

Photo: UCONN

By minimizing the amount of impervious cover on your property through the use of pervious pavements, you can personally make a difference in the health of Connecticut's rivers, lakes, streams, and estuaries!

Common Questions About Pervious Pavement

Do pervious pavements work in the winter?

Properly designed pervious pavements can perform better than traditional pavements in the winter months. Unlike traditional pavements, water does not pool on pervious pavements – it infiltrates into the ground. This prevents snow and ice from refreezing on the surface and organic activity in the soils prevents the recharge bed from freezing. Pictures from a University of New Hampshire Stormwater Center study* compare two 25°F parking lots after plowing:

Pervious Asphalt

Traditional Asphalt

Pervious pavements should not be treated with sand, to prevent clogging the infiltration spaces. Studies have shown that pervious pavements can use up to 75% less salt for deicing purposes than traditional pavements.

How do you maintain pervious pavements?

Pervious pavements should be vacuumed with a specially designed vacuum 2-4 times a year to remove debris and excess sediments from the void spaces. Although pervious pavements can still infiltrate water when they are partially clogged, proper maintenance is important to maximize water quality benefits.

How much does pervious pavement cost?

The costs of pervious pavement can vary, depending on the type of pavement, soil types and depth to groundwater, and the size of the project. The initial costs may be higher than traditional pavements but this is often offset by savings in infrastructure costs such as stormwater ponds and curbs, and less need for deicing in the winter.

Want to Know More? Click to Explore!

Resources in Connecticut:

Connecticut DEEP's Watershed Management Program:
www.ct.gov/dep/watershed

Connecticut DEEP's *2004 Connecticut Stormwater Quality Manual*:
www.ct.gov/dep/cwp/view.asp?a=2721&q=325704&depNav_GID=1654

UCONN's Nonpoint Source Education for Municipal Officials (NEMO*) Planning for Stormwater* web site:
www.nemo.uconn.edu/tools/stormwater/index.htm

UNH Stormwater Center Resources:

Main web site:
http://www.unh.edu/erg/cstev/

Winter Maintenance Guidelines for Porous Pavements:
http://www.unh.edu/erg/cstev/pubs_specs_info/winter_maintenance_fact_sheet.pdf

*Publications, Specifications, and Information on Pervious Pavements:
http://www.unh.edu/erg/cstev/pubs_specs_info.htm

Environmental Protection Agency Resources:

The EPA's Green Infrastructure Web Site – Permeable Pavements:
http://cfpub.epa.gov/npdes/greeninfrastructure/technology.cfm#permpavements

The EPA's LID Web Site Provides Information on Permeable Pavements and LID Costs:
http://www.epa.gov/nps/lid/

Other Resources:

An article on the longevity of pervious pavements in the journal *Stormwater*:
http://stormh2o.com/may-june-2003/pavement-porous-bmps.aspx

Additional Town Information:

Including contacts and local resources

Fourth Brochure of the LID Series

For more information contact Connecticut DEEP's Watershed Managment Program:

(860) 424-3020

http://www.ct.gov/dep/watershed

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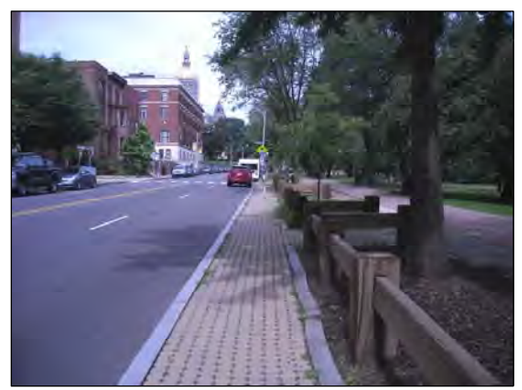
Rainfall as a Resource

A Resident's Guide to Pervious Pavement in Connecticut



This pervious pavement sidewalk at Bushnell Park in Hartford was funded in part by a Section 319 Clean Water Act Grant. Photo: CT DEEP

Connecticut Department of Energy and Environmental Protection
Bureau of Water Protection and Land Reuse
Planning and Standards Division
79 Elm Street, Hartford, Connecticut 06106

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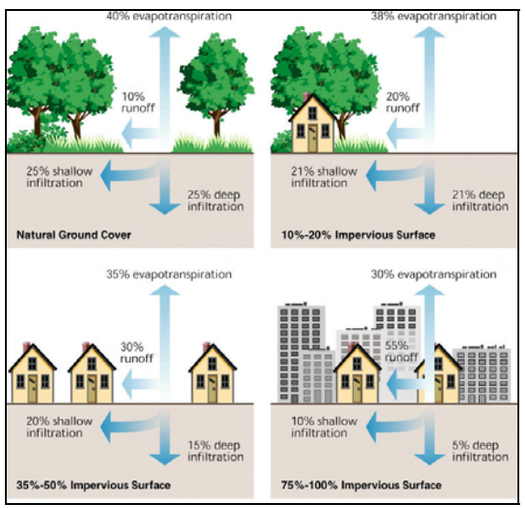

Photo: FISRWG

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Conventional methods of land development collect and convey stormwater quickly into a series of drains and pipes that flow directly into the closest waterbody with little or no water quality treatment.

How can we help? Install a Rain Barrel!

Low Impact Development (LID) techniques manage stormwater runoff by mimicking the natural movement of water in the environment. One of the easiest and most cost effective methods for conserving water and improving water quality is to **INSTALL A RAIN BARREL**. Rain barrels collect water from rooftops and store it for later use. The water can then be reused for a variety of water needs. Using a rain barrel at your home can:

- Capture a valuable resource that would otherwise be lost to storm drains
- Divert stormwater back to the landscape
- Conserve tap water and energy use
- Lower your water and utility bills

Installing a rain barrel is also an easy way to make your home environmentally friendly!

Photo Aaron's Rain Barrels

What is a Rain Barrel?

Rain barrels are specially designed containers that hold about 40-75 gallons of water. Rain barrels come in a variety of different styles, colors, and materials ranging from wooden barrels to recycled plastics. Designs include a screen or closed top for keeping debris and mosquitoes out of your rain barrel.

Why Use a Rain Barrel?

Installing a rain barrel can reduce the amount of stormwater runoff and improve water quality in your community. Diverting runoff from your roof into a rain barrel reduces the amount of stormwater being discharged into storm sewers that empty into nearby rivers, lakes, and streams. Collecting rooftop runoff in rain barrels and using it for other purposes can help to:

- Help to control local flooding
- Recharge local groundwater resources
- Protect rivers and streams from erosion
- Keep pollutants from paved areas from entering waterways
- Help to reduce the need for sewer upgrades in combined sewer overflow communities

Installing a rain barrel is a simple and easy way to save money and conserve water, with the added benefits of decreasing stormwater runoff and improving water quality!

How a Rain Barrel Works

A rain barrel is a container that stores water from the downspout of a rooftop gutter. Rain barrels have a spigot at the bottom that attaches to a garden hose and an overflow device to route excess water away from the foundation. They have better water pressure when full - elevating the barrel can help the water to drain more easily due to gravity. Rain barrels can weigh up to 500 lbs. when full, so it is important to place the barrel on a firm, level surface such as cement blocks or pavers.

Photo: CT DEEP

It Pays to Conserve Water!

Reduce Local Flooding – Rain barrels can help to reduce local flooding if used on a larger scale. If 100 houses in a neighborhood installed three 50-gallon rain barrels, 15,000 gallons of water could be saved after just ¼ inch of rainfall. That is enough water to run the average sprinkler for over 62 hours!

Photo: NE Rain Barrel Company

Save Water and Energy– Most people don't realize that conserving water can also save energy. Over 9% of the electricity in the United States is used to pump, treat and heat water! By collecting water in rain barrels, you can personally make a difference in reducing the energy use that contributes to excess greenhouse gases. Rainwater harvesting can help to reduce water related energy use as well as save you money.

Photo: A. Cadman

Save Money – Just ¼ of an inch of rainfall can yield up to 150 gallons of water from a 1000 ft^2 rooftop – enough to fill three rain barrels! If you have public water, you can save money on your water bill. If you have your own well, a few rain barrels could provide savings on your energy bills.

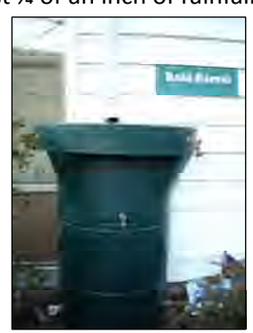

Photo: CT DEEP

Frequently Asked Questions

Do rain barrels provide mosquito habitat?

Most rain barrels are fully enclosed or have a screen and caulking around the downspout to prevent mosquitoes and other debris from entering the barrel. If the rain barrel is properly installed and maintained, mosquitoes do not have the opportunity to breed.

How much does a rain barrel cost?

An average rain barrel costs between $55 and $120. Many watershed associations and garden clubs offer reduced pricing on rain barrels. You can save even more money by making your own rain barrel. The reference section has a web site with detailed instructions on how to construct a rain barrel.

How do I maintain my rain barrel?

To keep your rain barrel in good condition:

1. Use the water in your rain barrel frequently so that storage is available for the next rain event
2. Before the winter months, drain the barrel, clean it with a non-toxic cleaning solution, and check all of the connections for repairs
3. Store the empty barrel upside down to keep it from freezing until you are ready to use it again in the Spring.

If properly maintained, the average life span of a rain barrel is 20 years – a great investment!

How can I use the water in my rain barrel?

You can use the water to irrigate your lawn, water indoor/outdoor plants, fill outdoor fountains, wash your car, or clean household windows. The water in the rain barrel can collect pollutants from your roof and *should not be used for drinking water.* Depending on your property, the water may not be suitable for vegetable gardens. Larger collection systems called cisterns can be used as a potable water source if the water is properly treated prior to use. Further details on rainwater harvesting can be found in the reference section.

Want to Know More? Click to Explore!

Resources in Connecticut:

Connecticut DEEP's Watershed Management Program:
www.ct.gov/dep/watershed

The CT DEEP's *2004 Connecticut Stormwater Quality Manual*:
www.ct.gov/dep/cwp/view.asp?a=2721&q=325704&depNav_GID=1654

UCONN's Nonpoint Source Education for Municipal Officials (NEMO*) Planning for Stormwater* web site:
www.nemo.uconn.edu/tools/stormwater/index.htm

How to Construct Your Own Rain Barrel:

Center for Watershed Protection's *How to Build and Install a Rain Barrel* Fact Sheet:
www.cwp.org/Resource_Library/Center_Docs/Residential/rainbarrelgarden.pdf

For Local Vendors That Sell Rain Barrels:

Check your local garden supply center
Ask your local watershed association
Google Search for: "Rain Barrel and Connecticut"

Other resources:

The EPA's Municipal Handbook - Rainwater Harvesting Policies:
www.epa.gov/npdes/pubs/gi_munichandbook_harvesting.pdf

The EPA's *WaterSense* Program:
www.epa.gov/watersense/water/simple.htm

The American Rainwater Catchment Systems Association:
www.arcsa.org/

The Texas Manual on Rainwater Harvesting:
www.twdb.state.tx.us/publications/reports/RainwaterHarvestingManual_3rdedition.pdf

Information on the link between energy use and water:
www.rivernetwork.org/water-energy-nexus

Additional Town Information:

Including contacts and local resources

Third Brochure of the LID Series

For more information contact Connecticut DEEP's Watershed Management Program:

(860) 424-3020

http://www.ct.gov/dep/watershed

The DEP is an affirmative action/equal opportunity employer. In conformance with the ADA individuals with disabilities who need information in an alternative format, to allow them to benefit and/or participate in the agency's programs and services, should call (860)-424- 3051 or (860) 418-5937 and make their request to the AAO staff person. Requests for accommodations to attend meetings and/or educational programs, sponsored by the DEP, must be made at least two weeks prior to the program date. These requests may be made directly to Marcia Z. Bonitto, ADA Coordinator, via e-mail: Marcia.Bonitto@ct.gov

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Rainfall as a Resource

A Resident's Guide to Rain Barrels in Connecticut

Rain barrels collect and store water from rooftop runoff for later use. Photo: P. Young

Connecticut Department of Energy and Environmental Protection
Bureau of Water Protection and Land Reuse
Planning and Standards Division
79 Elm Street, Hartford, Connecticut 06106

What's Happening to the Water Cycle?

As we develop our land and increase the amount of paved surfaces and buildings (known as impervious cover), the water cycle is changed. Less rainfall and snowmelt sinks into the ground and more water flows rapidly over the land into our lakes, rivers, and estuaries. Stormwater runoff can lead to increased flooding, erosion, pollution, and decreased groundwater recharge during dry periods.

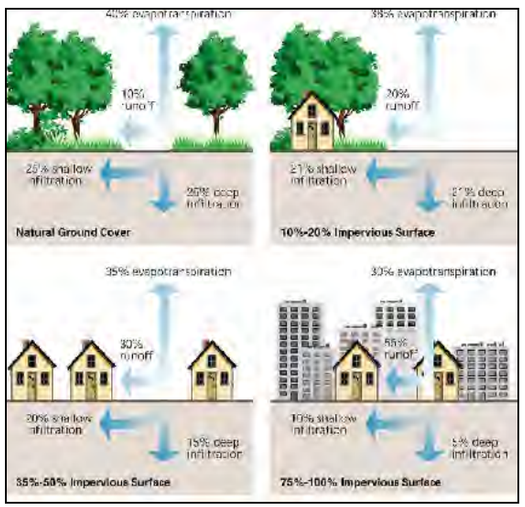

Photo: FISRWG

As impervious surfaces increase, the problems associated with stormwater also increase. Stormwater can contain pollutants such as sediment, nutrients, bacteria, and chemicals that can threaten aquatic health and contribute to the loss of water dependent recreational activities. Stormwater is recognized nationally as the leading cause of water pollution today.

Conventional methods of land development collect and convey stormwater quickly into a series of drains and pipes that flow directly into the closest waterbody with little or no water quality treatment.

How can we help? A Rain Garden!

Low Impact Development (LID) techniques manage stormwater runoff by mimicking the natural movement of water in the environment. One of the easiest and most cost effective methods for recharging groundwater resources, decreasing the volume of stormwater runoff, and improving water quality is to **INSTALL A RAIN GARDEN**. Rain gardens help to infiltrate water on site and improve water quality by filtering out pollutants. Rain gardens can also be attractive additions to the landscape that provide habitat for birds, butterflies, and other wildlife year round.

Photo: TRBP

What is a Rain Garden?

Rain gardens, also called bio-retention areas or bio-filters, are depressed garden beds filled with a variety of native perennials and shrubs that are both water and drought-tolerant. Rain gardens collect runoff from impervious surfaces and allow it to infiltrate into the ground. Designed to fill with a few inches of water from a storm, rain gardens slowly release runoff into the ground rather than allowing it to flow into the stormwater system.

Why Plant a Rain Garden?

Studies suggest that stormwater runoff is the number one source of water pollution in the nation. Planting a rain garden can improve water quality in your community by preventing sediment, nutrients, bacteria, and chemicals from flowing into streams, rivers, and lakes. By infiltrating stormwater, rain gardens can:

- Keep oil and grease from paved areas from entering waterways
- Filter pesticides and fertilizers from lawns
- Protect rivers and streams from erosion
- Recharge local groundwater resources
- Provide habitat for beneficial insects and birds and other wildlife

Installing a rain garden is as easy as planting a regular garden, with the added benefits of improving water quality and decreasing stormwater runoff! However, it is important to properly plan your rain garden to maximize stormwater infiltration.

Planting a Rain Garden

Location – The rain garden should be located 10 feet from the house and away from septic tanks, wells or areas that remain wet. A flat site with plenty of sun works best.

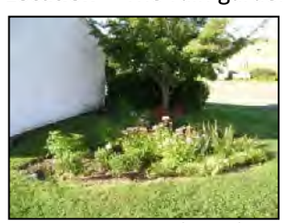

Photo: E. Thomas

Soils – The soil of your rain garden should allow for proper infiltration. If you are unsure of your soil, dig a hole 6 inches deep and fill it with water. If water remains after 24 hours, the site is not suitable for a rain garden.

Photo: TRBP

Size– The rain garden should be able to retain and infiltrate the first one inch of runoff from the area that drains to it. Detailed examples can be found in the manuals cited at the end of this brochure.

Photo: E. Thomas

Design – A rain garden is just like any other garden that you might have in your yard. The only difference is the plants must be able to handle both wet and dry conditions. A variety of native plants and shrubs that bloom throughout the season will add color and interest as well as food and habitat for birds, butterflies and other wildlife.

Photo: E. Thomas

Installation- Dig the garden about eight inches deep, creating a flat basin where the water will collect. The extra soil can be used to create a berm to help retain the water. Be sure that there are no underground utilities that will be in the way. Use the toll free CT *Call Before You Dig* service (1-800-922-4455) if you are unsure.

Photo: TRBP

Maintenance– Maintaining a rain garden does not require specialized gardening skills. As with any garden, it is necessary to water the garden until it is established, weed, replace dead plants, and add mulch as needed.

Photo: TRBP

Common Questions About Rain Gardens

Does a rain garden hold standing water?

No. Rain gardens are designed to infiltrate water and remain dry between rainfall events. The water that collects in the rain garden should infiltrate within 36 hours after a storm. Properly constructed rain gardens do not provide breeding areas for mosquitoes because 1-2 weeks of standing water are needed to successfully complete the mosquito life cycle.

How much does a rain garden cost?

An average residential rain garden costs between 3-5 dollars per square foot. The main expenses are associated with purchase of plants and any necessary drainage piping. These costs can be minimized by using native plants transplanted from elsewhere in your yard or from a friend's property. Another way to minimize costs is to install it yourself. A simple rain garden can be created in just a few hours with help from family or friends.

Do rain gardens work in winter?

Yes. If it is warm enough to rain or for snow to melt, the soil will absorb runoff. The roots of the plants will also help to infiltrate the water. The garden can also be designed to provide wildlife with winter food and habitat and provide year-round interest.

Are rain gardens difficult to maintain?

No. A rain garden requires no more effort to maintain than a regular garden bed. As with all new gardens, rain gardens may require additional watering and weeding until the plants establish root systems. Yearly mulching and pruning will help to maintain the functionality and aesthetic qualities of your rain garden.

Want to Know More? Click to Explore!

Statewide Information:

The CT DEP's Watershed Management Program:
http://www.ct.gov/dep/watershed

Call Before You Dig
http://www.cbyd.com/
1-800-922-4455

The UCONN Cooperative Extension System's guide to building a rain garden:
http://www.nemo.uconn.edu/tools/publications.htm

The Connecticut Master Gardener Association:
http://www.ctmga.org/

Planting Information:

The *Connecticut Native Tree and Shrub Availability List* published by the CT DEP:
http://www.ct.gov/dep/lib/dep/wildlife/pdf_files/habitat/ntvtree.pdf

The Connecticut College Arboretum's information on native plants:
http://arboretum.conncoll.edu/

The *Connecticut Native Plant and Resource List* by the US DOT Federal Highway Administration:
http://www.fhwa.dot.gov/environment/rdsduse/ct.htm

Local Connecticut Examples:

Town of Coventry Rain Garden Demonstration:
http://www.thamesriverbasinpartnership.org/coventry.raingarden.htm

The USDA Natural Resource Conservation Service information about rain gardens at:
http://www.ct.nrcs.usda.gov/eln-educational_materials.html

Other State Resources:

The Vermont Rain Garden Manual:
http://www.vermontconservation.org/images/stories/vtraingardenmanual.pdf

The Wisconsin Department of Natural Resources Rain Garden Manual:
http://www.dnr.state.wi.us/org/water/wm/dsfm/shore/documents/rgmanual.pdf

The Kansas City 10,000 Rain Gardens Project:
http://www.rainkc.com/

Additional Town Information:

Including contacts and local resources

Second Brochure of the LID Series

For more information contact CT DEP's Watershed Management Program:

- Jessica Morgan - LID Coordinator
  jessica.morgan@ct.gov
  860-418-5994

http://www.ct.gov/dep/watershed

The Department of Environmental Protection is an affirmative action/equal opportunity employer, providing programs and services in a fair and impartial manner. In conformance with the Americans with Disabilities Act, DEP makes every effort to provide equally effective services for persons with disabilities. Individuals with disabilities needing auxiliary aids or services, or for more information by voice or TTY/TDD, call (860) 424-3000.

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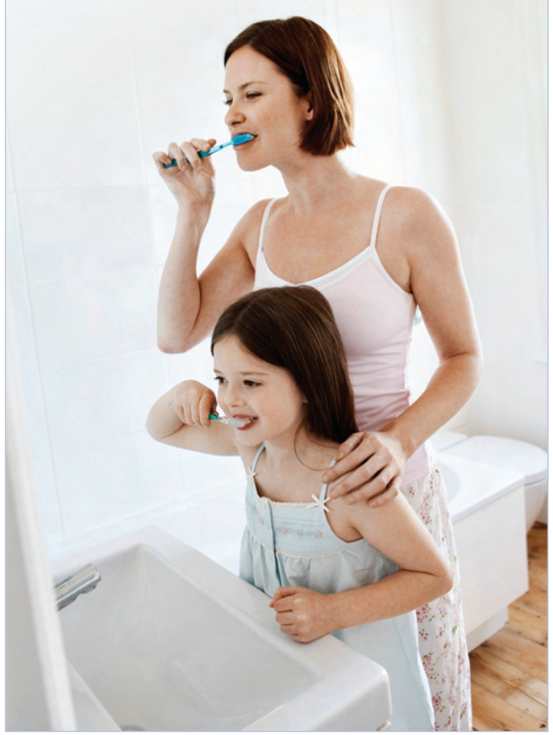
Rainfall as a Resource

A Resident's Guide to Rain Gardens in Connecticut

This rain garden in Vernon, CT was constructed as a demonstration project to treat and infiltrate runoff from an outdoor pavilion. Photo: USDA NRCS

Connecticut Department of Environmental Protection
Bureau of Water Protection and Land Reuse
Planning and Standards Division
79 Elm Street, Hartford, Connecticut 06106

Saving water around the home is simple and smart. The average household spends as much as $500 per year on its water and sewer bill but could save about $170 per year by retrofitting with water-efficient fixtures and incorporating water-saving practices.



Let WaterSense® show you how to save water—and your wallet.

How much money you save will depend on the cost of water where you live, but it makes sense that using less water lowers your utility bill. More importantly, using less water preserves this limited resource for generations to come.

look for WaterSense Meets EPA Criteria

(866) WTR-SENS (987-7367)
www.epa.gov/watersense watersense@epa.gov

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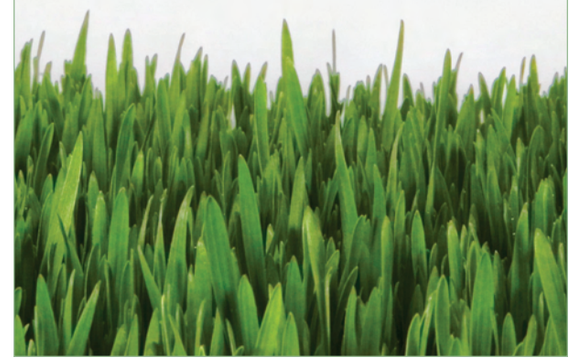
March 2008 EPA-832-F-07-011

EPA WaterSense

Simple Steps to Save Water



Inside the Home

By giving your bathroom a water efficiency makeover with WaterSense labeled toilets and faucets, you could save more than 11,000 gallons annually—and that's no drop in the bucket.

Get Flush With Savings

- Consider installing a WaterSense labeled toilet, which uses 20 percent less water while offering equal or superior performance. Compared to older, inefficient models, WaterSense labeled toilets could save a family of four more than $90 annually on its water utility bill, and $2,000 over the lifetime of the toilets.
- Check for toilet leaks by adding food coloring to the tank. If the toilet is leaking, color will appear in the bowl within 15 minutes. (Make sure to flush as soon as the test is done, since food coloring can stain the tank.)

Accessorize Your Faucet

- Installing a WaterSense labeled aerator is one of the most cost-effective ways to save water. Also consider replacing the entire faucet with a WaterSense labeled model. Either way, you can increase the faucet's efficiency by 30 percent without sacrificing performance.
- Repair dripping faucets and showerheads. A drip rate of one drip per second can waste more than 3,000 gallons per year.

Clean Up With Savings

- A full bathtub can require up to 70 gallons of water, while taking a 5-minute shower uses only 10 to 25 gallons.
- Turning off the tap while you brush your teeth can save 8 gallons per day.

Lighten Your Loads

- Wash only full loads of dishes and clothes or lower the water settings for smaller loads.
- Replace your old washing machine with a high-efficiency, ENERGY STAR® labeled model, which uses up to 50 percent less water and electricity.

The average single-family suburban home uses at least 30 percent of its water for outdoor purposes such as irrigation and as much as 70 percent in dry climates. Some experts estimate that more than 50 percent of landscape water is wasted due to evaporation, wind, or overwatering.

Water When Needed

- Water your lawn or garden during the cool morning hours, as opposed to midday, to reduce evaporation.
- Look for sprinklers that produce droplets, not mist, or use soaker hoses or trickle irrigation for trees and shrubs.
- Set sprinklers to water lawns and gardens only. Check that you're not watering the street or sidewalk.
- Try not to overwater your landscaping. Learn plants' water needs and water different types appropriately.

Grow Green Grass

- Don't overfertilize. You will increase the lawn's need for water.
- Raise your lawn mower blade to at least 3 inches. Taller grass promotes deeper roots, shades the root system, and holds soil moisture better than a closely cropped lawn.

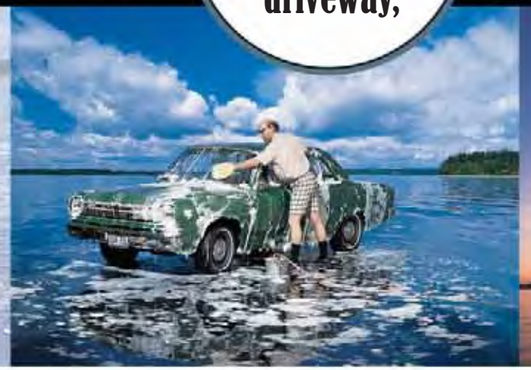
Garden With Care

- Plant climate-appropriate species. Try plants that are native to where you live, which don't require as much water, and group plants together by water requirements.
- Use mulch around trees and plants to help reduce evaporation and control water-stealing weeds.

Outside the Home

LONG ISLAND SOUND STUDY

When you're washing your car in the driveway,



...you're not just washing your car in the driveway.

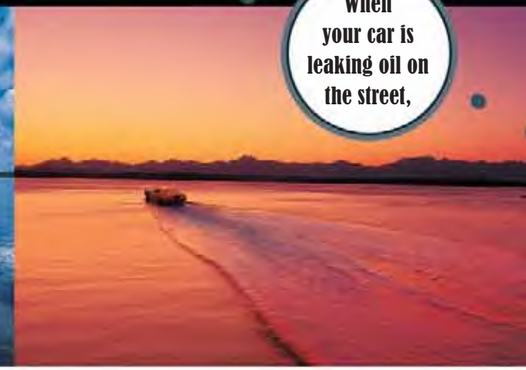
When your pets go on the ground,

...they're not just going on the ground.

When you're fertilizing the lawn,

...you're not just fertilizing the lawn.

When your car is leaking oil on the street,



...it isn't just leaking oil on the street.

Step by Step

A citizen's guide to curbing polluted runoff

www.longislandsoundstudy.net

A Partnership to Restore and Protect the Sound

If you wash your car on the street or driveway, soap, scum, and oily grit will be washed into nearby storm drains and into lakes, streams, and Long Island Sound without any treatment. This causes pollution that is unhealthy for fish and people.

So how do you avoid this mess? Wash your car on grass or gravel surfaces instead of on paved streets. Or better yet, take it to a commercial car wash where the water is treated and recycled.

If pet waste is not properly disposed of, that waste is washed into nearby storm drains by rain or melting snow. Pet waste can be a source of bacteria. Storm sewers drain directly into lakes, streams, and Long Island Sound, delivering bacteria and other pollutants to the water.

So what to do? Take a pooper scooper or plastic bag along on your next walk. Flush only the waste, or if local law allows, seal it in a plastic bag and dispose of it in the garbage.

If you apply fertilizer just before a rainstorm, much of it will be washed into nearby storm drains and into lakes, streams, and Long Island Sound without any treatment. Once in the water, fertilizers spur a growth and decay process in algae. The algae then use up oxygen, which fish need to survive.

So when you fertilize your lawn, avoid applying it before a rainstorm, use it sparingly, and use organic, slow-release fertilizers.

When oil leaks from our cars onto streets and driveways, it is washed into nearby storm drains and eventually makes its way into lakes, streams, and Long Island Sound. Picture the number of cars in your area and imagine the amount of oil that finds its way from leaky gaskets into our waterways.

So please, fix oil leaks and never dump motor oil or other engine fluids down storm drains or onto the ground.

Visit these web sites for information about polluted runoff

Long Island Sound Study:
www.longislandsoundstudy.net/runoff

Connecticut Department of Environmental Protection: http://dep.state.ct.us/wtr

New York State Department of Environmental Conservation: www.dec.state.ny.us/website/dow

U.S. Environmental Protection Agency:
www.epa.gov/nps

Be a Part of the Pollution Solution!

What is Polluted Runoff?

Polluted runoff occurs when it rains or when snow melts. Water washes over roads, parking lots, lawns, and sidewalks, removing oil, debris, soil, and fertilizer from those surfaces. The water and pollutants then flow directly into waterways, or into nearby storm drains and are carried—untreated—to our rivers, lakes, and oceans.

In recent years, sources of water pollution originating from industrial and sewage treatment plants have been greatly reduced. If we want to continue to make progress, more effort is needed to control polluted runoff, such as oil leaking from cars or fertilizer washing off lawns. And remember, don't dump! Only rainwater should go down a storm drain.

Help Clean up Long Island Sound.

A Clean Long Island Sound is Important to All of Us.

You don't have to live near Long Island Sound for your actions to affect its water quality. Oil spilled within the Sound's watershed may eventually find its way into the Sound. The environmental impacts from polluted runoff are gradual, but severe. The cumulative effects of polluted runoff can make the water unhealthy for fish and for people.

It's up to all of us to keep our lakes, streams, and Long Island Sound clean. Polluted runoff can be reduced significantly if everyone incorporates small preventive measures into their regular everyday activities, such as properly disposing of pet waste or minimizing use of lawn fertilizers.

The Long Island Sound Study is a partnership of federal, state, and local government agencies, private organizations, educational institutions, and other concerned organizations and individuals. Through a cooperative effort, these groups are working together to restore and protect Long Island Sound.

For more information about Long Island Sound or to order additional copies of this brochure, call the office at (203) 977-1541, or (631) 632-9216, or visit www.longislandsoundstudy.net.

What You Can Do

Wash your car on a grassy area so the ground can filter the water naturally.

Use soap sparingly and use non-phosphate detergents.

Use a high-pressure, low-volume hose that has a trigger nozzle to save water.

Empty your bucket of used, soapy water down the sink, not on the driveway or in the street.

Best of all, take your car to a commercial car wash. Most car washes reuse wash-water several times before sending it to a sewage treatment plant.

If you plan to hold a car wash fund-raising event, contact your public works department for suggested disposal methods of the soapy water.

What You Can Do

Scoop up pet waste.

Flush the waste—as long as the droppings are not mixed with litter or other materials. This method is best because then your community sewage system treats the pet waste.

Seal the waste in a plastic bag and put it in the garbage, if local laws allow.

Bury the waste.

Never dump pet waste into a storm drain.

If your community does not regulate pet waste, encourage your local government to adopt a "Pooper-scooper" ordinance.

If your local parks do not provide pet waste stations, encourage them to do so.

What You Can Do

Use fertilizers sparingly. Lawns and many plants do not need as much fertilizer as you might think.

Use organic, slow-release fertilizers.

Don't fertilize before a rain storm or a frost.

Use commercially available compost, or make your own using garden/yard waste. Mixing compost with your soil means your plants will need less chemical fertilizer and puts your waste to good use. Commercial compost may be available from your local solid waste utility or a garden store.

Don't bag grass clippings. Use a mulching lawn mower and naturally fertilize your lawn with the grass clippings.

Wash your spreader and equipment on a pervious area like the lawn, not on the driveway. This allows natural absorption of excess fertilizer.

Maintain a buffer strip of unmowed natural vegetation bordering all water bodies to trap excess fertilizers and sediment.

What You Can Do

Check your car often for drips and oil leaks and fix them promptly.

Have your car tuned-up regularly to reduce oil use.

Use ground cloths or drip pans under your vehicle if you have leaks or are doing engine work.

Recycle used motor oil. Many auto supply stores, car-care centers, and gas stations will accept used oil. Many communities have hazardous-waste collection days and locations where used oil can be properly disposed.

Clean up spills immediately; you can use kitty litter or sand to soak up the liquid.

Collect all used oil in containers with tight-fitting lids. Old plastic jugs are excellent for this purpose.

Do not mix waste oil with gasoline, solvents or other engine fluids. This contaminates the oil, which may be reused, and may form a more hazardous chemical.

Never dump motor oil, antifreeze, transmission fluid, or other engine fluids down storm drains, into road gutters, on the ground, or into a ditch.

EPA
NEIWPCC

The Long Island Sound Study thanks the Washington State Department of Ecology, King County and the cities of Bellevue, Seattle and Tacoma for letting us adapt these images and concepts for use in educating the Long Island Sound community about polluted runoff. This brochure was developed for the Long Island Sound Study by the New England Interstate Water Pollution Control Commission through a cooperative agreement with the U.S. Environmental Protection Agency.

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PRIVATE DRINKING WATER IN CONNECTICUT

Publication Date: May 2013

Publication No. 24: Private Well Testing

Testing your well water provides you with information on the quality of your drinking water. Testing is the best way to ensure that your drinking water supply is safe from harmful chemicals. In addition, water testing can determine whether nuisance impurities are present, such as iron and manganese. The purpose of this fact sheet is to assist private well owners in deciding how frequently to test their private well water and what to test for. It also provides homeowners with information about how to get their water tested, understanding their water test results and protecting their well from contamination.

Private Water Supplies

Homeowners with private wells are responsible for the quality of their own drinking water. They are generally not required to test their drinking water. However, testing is a good idea even if you do not suspect a problem because testing is the only way to be sure your water is safe to drink. A good time to test is when buying a home so that you can make any contamination findings part of your home purchase decision. The best time of the year to test is after a spring or summer heavy rainy period. Even if your current water supply proves to be clean and safe to drink, regular testing is important because it establishes a record of water quality that may help identify and solve future problems.

In accordance with Section 19-13-B101 of the Public Health Code, testing is required for new wells. However, the required tests do not cover all contaminants. Water tests done during home purchases are usually required by the bank providing the mortgage. Contrary to common belief, such tests are not required by law. Water tests done for a home purchase do not necessarily cover all contaminants.

This fact sheet provides general guidelines for private well water testing. However, these are just guidelines. Check with your Local Health Department to find out whether there are water quality problems specific to your area. It is also a good idea to ask your neighbors whether they have ever had water quality problems. The Connecticut Department of Public Health (DPH) Private Well Program is also a resource for questions about private well testing. DPH's Environmental and Occupational Health Assessment Program is a resource for questions about safe limits of chemicals in water and health concerns. Contact information is provided at the end of this fact sheet.

What To Test For? How Frequently to Test?

Even if you do not suspect any well water problems, it is important to test your water to ensure that it is safe to drink. Table 1 lists the tests we recommend for all private wells even if you do not notice any problems with your water. Table 3 lists water quality issues you might encounter and what tests you should do if you have a particular issue with your water. Whenever you notice a change in the taste, color, odor, or clarity of your water, contact your Local Health Department or DPH for assistance.

Produced by The State of Connecticut Department of Public Health
Environmental Health Section, Private Well Program
450 Capitol Avenue, MS#51REC, PO Box 340308, Hartford, CT 06134
Phone: 860-509-7296 Fax: 860-509-7295

Table 1. Recommended Tests for All Private Wells

Type of Test	When?	Why?
Basic Indicators (Potability) See Table 2 below	**Every Year** Also test after repair or replacement of your well, pump or water pipes. *If 5 years of results show no problems, test once every 5 years.*	Provides a general indication of water quality. Can provide clues that additional tests are needed. Required for all new wells.
Lead	**At Least Once** Also test when planning a pregnancy or if you have a child under 6 years old. *If your water is corrosive (pH less than 6.0), test every 3-5 years.*	Lead can leach from plumbing (pipes and faucets). Lead pipes may be in homes built before 1930. Lead-based solder may be in homes built before 1988. Brass is used in new plumbing and fixtures. All brass contains small amounts of lead. Corrosive water leaches more lead. Young children are more susceptible to harmful effects from lead exposure.
Arsenic, Uranium, Radon	**At Least Once** Ideally, repeat test every 5 years	Arsenic, uranium and radon are naturally occurring in some groundwater in CT. Private wells with high levels have been found sporadically around CT. Levels can fluctuate over time.
Volatile Organic Compounds (VOCs)	**At Least Once**	Gasoline, oil, solvents or industrial chemicals spilled or leaked on the ground could get into your well water.
Fluoride	**Every 5 years when a child under 12 is present**	Fluoride can occur naturally in wells throughout CT. A child's permanent teeth can become discolored from excess fluoride. Too little fluoride can increase risk of tooth decay. Your child's dentist will likely ask you about the fluoride level in your well water.

Some acceptable limits are based on aesthetics and some are based on health. If your water exceeds a Basic Indicator Parameter, contact your Local Health Department for advice about whether you should stop drinking the water.

Table 2. Basic Indicators Test

Parameter	Acceptable Limit
Total Coliform Bacteria	None Present
Nitrate-Nitrogen	10 mg/L
Nitrite-Nitrogen	1 mg/L
pH	6.4 - 8.5 Standard Units
Odor	Less than 2
Chloride	250 mg/L (milligrams per liter)
Hardness	150 mg/L
Apparent Color	Less than 15 Standard Units
Sulfate	250 mg/L
Turbidity	Less than 5 Standard Units
Iron	0.3 mg/L
Manganese	0.05 mg/L (taste/odor concern) 0.5 mg/L (health concern)

Table 3. Private Well Water Quality Issues and Testing Recommendations

Water Quality Issue	Possible Cause(s)	Recommended Water Test(s)
Low pH (pH less than 6.0)	Naturally corrosive (low pH) water, low hardness, low alkalinity	Hardness, Alkalinity, Sulfate, Lead, Copper, Cadmium, Zinc
Buildup of limescale (off-white chalky solids) on hot water plumbing, fixtures, kettles. Reduced soap lathering.	Hard water (hardness level exceeding 150 mg/L)	Hardness
Blue or reddish stains on plumbing, fixtures or laundry. Plumbing leaks.	Corrosive (low pH) water.	Hardness, Alkalinity, Sulfate, Lead, Copper, Cadmium, Zinc
Rust-colored water, foul odor, rust stains on clothing and plumbing fixtures, rust coating in toilet tank	Elevated Iron or Manganese, Iron Bacteria	Iron, Manganese
Rotten egg odor, musty or swampy odor, tarnished copper and silverware, yellow or black stains on plumbing fixtures	Hydrogen sulfide gas, high sulfates, sulfur bacteria, iron/manganese bacteria, coliform bacteria	Odor, Hydrogen Sulfide, Sulfate, Coliform Bacteria, Iron, Manganese
Cloudy, Turbid, Muddy Water	Silt, Sediment, microorganisms	Turbidity and Coliform Bacteria, Check Well Construction with an expert
Chemical, fuel or fruity odor	Leaking underground fuel tank, gas station fuel spill, industrial chemical spill, road runoff	Volatile Organic Compounds (VOCs)
Nitrates exceed 10 mg/L Nitrites exceed 1 mg/L	Fertilizer runoff, malfunctioning septic system	Pesticides (contact your local health department about pesticide use in your area), Coliform Bacteria
Radon in Air exceeds 4 picocuries per liter	Naturally-occurring uranium in bedrock	Radon water test
Recurrent gastrointestinal illness	Human or animal waste contaminating well, cracked well casing, flooded well, malfunctioning septic system	Coliform Bacteria, Nitrates, Nitrites
Bitter, metallic taste	Corrosive (low pH) water	pH, Lead, Copper
Salty, brackish taste	Road salt runoff, nearby salt storage, well near salt water, improper setting on water softener	Chloride, Sodium, Total Dissolved Solids
Well within 1/4 mile of current or former orchard or farmland	Agricultural and/or arsenic-based pesticides get into well	Arsenic, Nitrates, Pesticides (ask for EPA Method 505)*
Well within 1/4 mile of commercial or industrial area	Gasoline, oil, solvents leaked or spilled on the ground get into well	Volatile Organic Compounds (VOCs)
Well flooding, ponding around well	Heavy rains, poor drainage around well	Basic Indicators
House foundation treated for termites before 1990	Termite pesticides leach into well	Pesticides dieldrin and chlordane
Noticeable change in taste, color, odor, or clarity of your water.	Unknown	Contact your local health department or DPH

* Contact your Local Health Department or CT Dept. of Energy and Environmental Protection for advice about whether you should test for additional pesticides.

What If I Already Have A Treatment System In My Home?

If you have water treatment equipment in your home, you should monitor whether the treatment system is doing its job by testing for the specific contaminant(s) that the system is treating. Be aware that water treatment systems are designed for specific contaminants. Treatment systems will not necessarily remove all contaminants! Periodically you should test your water before and after treatment to be sure the system is continuing to work properly. Refer to Purchasing Water Treatment Equipment for more information about treatment.

How Do I Get My Water Tested?

You can have your water tested at any State-certified water testing lab. A current list of certified labs can be obtained from your local health department or from the DPH Certified Environmental Labs website. Make sure the private lab is certified to test drinking water for the contaminants you are requesting.

In most cases, you can collect a sample of your tap water yourself, although many labs will send a technician to collect a sample if you request. If you collect your own sample, carefully follow the laboratory's instructions to obtain a good sample. How to take a sample varies depending on the tests being done. For example, some contaminants such as lead and copper may require that water remains stagnant in the pipes for a minimum of 6 hours and is collected upon the first draw of water. Other contaminants require that the water be flushed or run for a minimum period of time before collecting the sample. Some contaminants require special sample bottles and procedures. Cleanliness is a must; make sure that nothing but the water comes in contact with the opening of the bottle or the inside of the cap. Timeliness is important, too. Some contaminants deteriorate or change form with time. Most water samples need to be kept cool when being taken to the lab. To assure accurate results, make certain the lab receives your water sample within the specified time directed on the instructions.

Keep Records

Keep a record of all your water tests for reference. Include the date and the test results. A change in the concentration of a contaminant may indicate that a water quality problem is developing. By comparing test results over time, you may find that a change in treatment is necessary or that a treatment device is not functioning properly.

Understanding Your Water Test Results

There are federal and state criteria for many of the substances that you might find in your well water. These criteria represent the concentration above which your water might not be safe to drink or might have a noticeable taste or odor.

DPH sets state drinking water criteria specifically for private wells, called Action Levels. Action levels are developed to protect you from health risks. Federal drinking water criteria to protect your health are set by the Environmental Protection Agency (EPA) and are called Maximum Contaminant Levels (MCLs). You should compare the results of your private well tests to these criteria to determine whether the water is safe. If any chemical detected in your water is higher than an Action Level or an MCL, you should:

- Retest the water to confirm the exceedance,
- Stop drinking the water until the issue is resolved,
- Contact your Local Health Department, DPH, or DEEP for specific advice about using your water.
- Consider treatment to remove the contaminant(s) from your water. Refer to DPH's Publication about Purchasing Water Treatment Equipment for more information about treatment.

Refer to DPH's factsheet Chemical Contaminants in Private Wells factsheet for more information about drinking water criteria.

EPA also sets drinking water criteria to protect you from aesthetic concerns such as taste, color and odor. These criteria are called Secondary Standards. Secondary contaminants themselves do not present a health risk but could be an indication that your water has problems that could pose a health risk. One example is pH. If the pH of your water is too low, you might notice a bitter taste. The bitter taste does not pose a health risk but water with low pH is corrosive and corrosive water can leach metals like lead from pipes and fixtures. High levels of lead in your water does pose a health risk, particularly for young children.

Results of a Basic Indicators Test should be compared with the appropriate limits shown in Table 2 in this fact sheet. However, be aware that some of the parameters in the Basic Indicators Test are based on aesthetics (taste/color/odor) and some are based on health risk. If your water tests results exceed any of the limits on the Basic Indicators Test, contact your Local Health Department for advice regarding whether you should stop drinking the water.

Protect Your Well!

You can protect your private well by paying careful attention to what you do in and around your home as well as your neighbor's activities near your well. Regular testing and good practices to prevent contamination can help ensure that your well supplies you and your family with good quality drinking water. Here are some important ways you can protect your drinking water well.

⇒ Locate a new well far from potential contamination sources.
⇒ Hire a professional to construct a new well and periodically inspect an existing well.
⇒ Use backflow prevention devices on outside faucets.
⇒ Properly seal abandoned and unused wells.
⇒ Never flush gasoline, motor oils, automotive chemicals, painting chemicals or solvents down the sink or toilet into a septic system.
⇒ Inspect and maintain your septic system.
⇒ Keep livestock and pet waste away from well.
⇒ Do not allow road, driveway or roof runoff to collect around well.
⇒ Do not mix or use pesticides, herbicides, fertilizers, fuels or other hazardous materials near well.
⇒ Do not allow waste oils or gasoline to get into soil. Make sure home heating tanks are above ground or in basement. Never do automotive maintenance or repair on exposed soils in your yard.
⇒ Test your well water according to recommendations in this fact sheet.
⇒ As needed, consult sources of additional information listed at the end of this fact sheet.

For more information on well protection refer to Publication #26: Private Drinking Water Wells-Types of Construction

For More Information

For more information, please contact:

CT Department of Public Health

- Environmental and Occupational Health Assessment Program: 860-509-7740
- Private Well Program: 860-509-7296

CT Department of Energy and Environmental Protection

- Remediation Division: 860-424-3705

Your Local Health Department

For more information, click on the following links:

***Safe Drinking Water Limits*:**

- Action Levels
- MCLs
- Secondary MCLs

CT Department of Energy and Environmental Protection

- Potable Water Program
- Remediation Division

DPH Private Well Fact Sheets:

- Arsenic in Private Wells
- Lead in Private Wells
- Uranium in Private Wells
- Fluoride in Private Wells
- Bacteria in Private Wells
- Iron and Manganese in Private Wells (1), Iron and Manganese in Private Wells (2)
- Nitrogen Contamination in Private Wells
- pH Acidity of Private Wells
- Questions to Ask When Purchasing Water Treatment Equipment
- Flood and Storm Water Concerns for Private Wells
- Private Wells-Types of Construction
- Hardwater-Softeners Facts and Issues
- Corrosion of Copper Pipe and Fittings

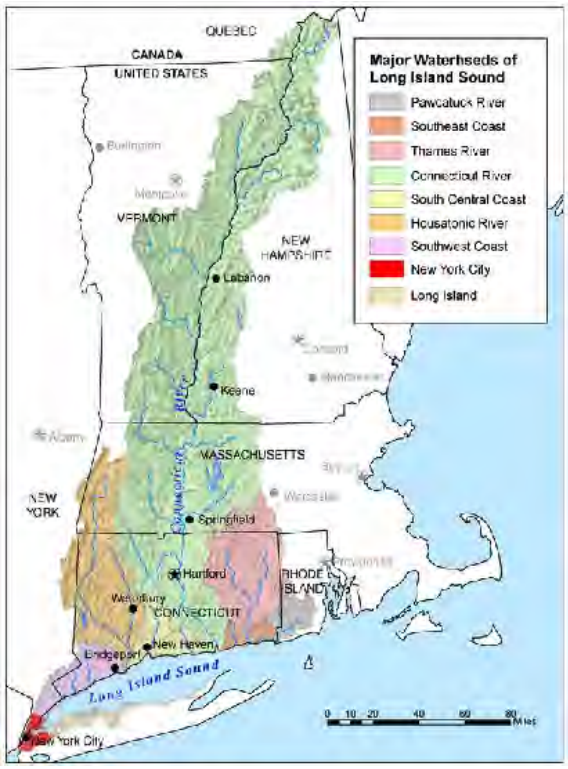
Other Resources:

- DPH Certified Environmental Labs
- Chemical Contaminants in Private Wells Fact Sheet
- DPH Groundwater and Well Contamination Publications
- DPH Private Well Program Publications
- ATSDR Hazardous Substances Fact Sheets (ToxFAQs)
- Hazardous Waste Site Lists
- EPA Office of Groundwater and Drinking Water
- EPA New England

If you require aid/accommodation to fully and fairly enjoy this publication, please contact 860 - 509 -7740.

Think Green, Stay Blue: Clean Water Starts with You!

The future health of Connecticut's water depends on the actions of every individual. No matter where we live, work, or play, we are somehow connected to a nearby river, stream, lake, pond, wetland, or shoreline. The rain that falls around us will always moves according to gravity, following a path to the nearest downhill body of water and, in Connecticut, eventually to Long Island Sound. This simple fact means that the health of Long Island Sound -- and every river and stream that flows into it -- is connected to how we live on the land. Yet, many people still think that water pollution is caused mostly by discharges from business and industry and are unaware of the unique role we play in determining the fate of our waterways.



The good news is that industrial discharges are largely under control thanks to the Clean Water Act passed in 1972. With passage of this act, we saw the number of healthy rivers across the nation (those considered clean enough for fishing and swimming) increase from just 20% in the mid-1900's to 57% by 1994. The bad news is that just ten years later we saw that number drop slightly to 53% and by 2012, only 48% of rivers and streams were considered clean enough for fishing and swimming.

With industrial discharges under control, what is causing the decline in river health? According the U.S. Environmental Protection Agency, it is polluted runoff. Runoff is the water that does not soak into the ground during a storm. Forests and meadows are excellent places for water to soak into the ground, but with a growing population these areas are giving way to more developed land (i.e. more buildings, roads, parking lots, lawns) and the volume of runoff is increasing. So is the amount polluted runoff -- water that picks up nutrients, salts, sediments, bacteria, pesticides, and other widely-used chemicals (like cleaning supplies and automotive fluids) from the landscape and carries them to nearby waterways. With fewer natural areas for water to soak into the ground and more pollutants being used in excess, nature's cleaning systems are overloaded, causing more pollutants to end up in our waterways.

With the health of our nation's rivers declining over the past two decades, now is the time for you to make a real and positive difference around your home to reduce polluted runoff. Here are just some of simple, River Smart steps you can take:

1. **Nurture native trees, shrubs, and flowers.** Native species require no fertilizers or pesticides or watering to keep healthy. They thrive in the local habitat and provide great food and shelter birds, pollinators, and other wildlife.
2. **Reduce the size of grass lawns.** Lawns limit the amount of water that can soak into the ground and often require large amounts of fertilizers and pesticides. If you do have a lawn, follow the rule "mow high and let it lie." By letting your grass grow taller, you also let the roots grow deeper, and leaving the clippings provides a natural fertilizer. Altogether, you will improve the lawn's ability to absorb water, stabilize soil, control weeds, and not dry out.

3. **Limit the amount of paved areas and create natural places for the water to soak into the ground.** Rain gardens and swales are excellent ways to attenuate and treat runoff from roofs and driveways. Pervious material like gravel, porous concrete, and field stone can be used for patios, driveways, and walkways.
4. **Plant or grow natural buffers at the edges of rivers/streams, lakes/ponds, and wetlands.** These buffers – made up of trees, shrubs, woody and herbaceous perennials and ground cover – prevent shoreline erosion, reduce flood impacts, capture and treat runoff by trapping sediment and removing nutrients, regulate water temperature, and provide food and habitat for wildlife.
5. **Reduce or eliminate use of fertilizers and pesticides.** These chemicals washed from your property with every rainstorm into a nearby waterway where they can cause algal blooms and be deadly to aquatic organisms. Before applying chemicals, get your soil tested to determine what you actually need and if necessary, use only a slow-release, low-concentration fertilizer or natural compost. If applying pesticides, spot treat only when absolutely necessary and carefully follow the safety guidelines provided.
6. **Dispose of pet waste in the trash or a pet-waste processor.** It is full of bacteria that can make our waterways unsafe for drinking, swimming and fishing.
7. **Have your septic tank pumped and inspected regularly.** A faulty system can release harmful bacteria to our waterways and can be costly to repair. Every system is different, but a good rule of thumb is to pump out every 3 to 5 years.
8. **Check and fix all the taps on sinks, baths, toilets, and hoses for leaks and drips.** Upgrade to more water-efficient appliances and fixtures, like those with the "WaterSense" logo (the water version of EnergyStar).
9. **Dispose of unused and unwanted medications in the trash; do not flush them down the toilet.** The fate of these chemicals interacting in the environment is still unclear and we are only just beginning to understand their effects on aquatic organisms.

To find resources to help you get started with these and other River Smart practices or to learn more about how polluted runoff affects the health of our local rivers, visit www.riversmartct.org. The River Smart program will introduce you to and provide you with the tools you need to and create areas to naturally absorb and filter runoff, to reduce chemical use, and to conserve water.

The future health of our water is in our hands. Working collectively, we CAN reduce water pollution and restore the health of our rivers, streams, lakes, and the Long Island Sound. Show your commitment to clean water by visiting **www.riversmartct.org** and make the River Smart Pledge today. Pledge participants will a River Smart yard sign, a pledge reminder magnet, and a resource packet (while supplies last).

River Smart is led cooperatively by Housatonic Valley Association, Pomperaug River Watershed Coalition, Kent Land Trust, Weantinoge Heritage Trust, Rivers Alliance of Connecticut, and the Farmington River Watershed Association. The River Smart initiative was made possible through generous grant support from Connecticut Community Foundation, Ellen Knowles Harcourt Foundation, LUSH Cosmetics' Charity Pot Program, Council of Governments of Naugatuck Valley, and the Merchant of New Preston Village. Publication Date: January 2015.

Don’t Flush Trouble!

It’s a toilet, not a trash can.
These items belong in the trash.

Cleaning wipes / Leftover Cleaners

Cigarette Butts

Moistened Wipes
(face, hands, etc)

Dental Floss

Feminine Products

Bandages

Hair

Condoms & Wrappers

Medications

Diapers and Baby Wipes

Cotton Swabs and Swipes

Cat Litter

Cooking Fats, Oils, Grease

The label might say “flushable” but disposable wipes and other products are clogging sewer pipes and damaging pumps and aerators. These problems can also cause raw sewage overflows into homes, businesses, and waterways. Plus, they are expense to fix and cost us all big bucks!

Going Green Keeps Water Clean. River Smart is led cooperatively by Housatonic Valley Association, Pomperaug River Watershed Coalition, Kent Land Trust, Weantinoge Heritage Trust, Rivers Alliance of Connecticut, and the Farmington River Watershed Association. The River Smart initiative was made possible through generous grant support from Connecticut Community Foundation, Ellen Knowles Harcourt Foundation, LUSH Cosmetics’ Charity Pot Program, Council of Governments of Naugatuck Valley, and the Merchant of New Preston Village.
Publication Date: January 2015.

Proper Maintenance

The accumulated solids at the bottom of the septic tank should be pumped out every three to five years (depending on use) to prolong the life of your system. Contact your local septic system pumper for an initial pump out and inspection.

A properly designed and maintained septic system:

- Requires minimal care
- Costs less to maintain than sewer fees
- Helps replenish groundwater

Neglect or abuse of your septic system can cause it to fail resulting in **tens of thousands of dollars in repair costs** and causing a serious health threat to your family, neighbors and even your community.

Common causes of failure are:

- Overloading the systems with more water than it is designed to treat
- Improper disposal of liquids (chemicals) and solids (trash) into the septic tank
- Neglecting to have the septic tank pumped – full tank or clogged leach field
- High water table flooding the leach field
- Improper placement of decks, garages, swimming pools, trees near leach field or pipes

The signs of a failing septic system are:

- Sluggish drains or odor
- Wastewater backups into house
- Squishy areas above leach field
- Lush grass above leach field

Why are we concerned about septic systems?

The Pomperaug River Watershed is the primary source of clean drinking water for its residents. A malfunctioning septic system can pollute our rivers and lakes with weed enriching nutrients, and the groundwater from which we draw our drinking water with bacteria and chemicals.

Nearly all homes in our watershed are served by private septic systems. Private septic systems must be maintained by the homeowner. Unfortunately, septic systems are often neglected and not routinely maintained after the initial installation. Treatment and disposal of wastewater should be one of the primary concerns of any homeowner in an unsewered area.

atlantic states
RURAL WATER & WASTEWATER ASSOC.

POMPERAUG RIVER WATERSHED COALITION

River Smart
ASPETUCK POMPERAUG RIVER PARTNERS

Atlantic States Rural Water and Wastewater Association
(www.asrwwa.org)

Pomperaug River Watershed Coalition
(www.pomperaug.org)

Aspetuck-Pomperaug River Partners
(www.APriverpartners.org)

Funding to print this brochure comes through the Watershed Assistance Small Grant Program, conducted in association with the Connecticut Department of Environmental Protection under Section 319 of the Clean Water Act. The small grants program is administered by Rivers Alliance of Connecticut.

Image credits: (Cover) Environmental Health Dept., Washentaw County, Michigan - http://www.ewashtenaw.org/government/departments/environmental_health/wells_septic. (Inside panel) Septic System Fact Sheet by Clear Waters, a partnership between CT Sea Grant and CT NEMO - http://www.cag.uconn.edu/ces/sustainability/pdf/cleanwater/cwfact3.pdf

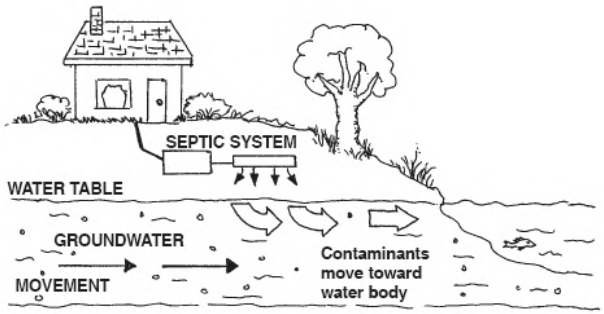
What's in Your Yard?

When you flush your toilet, or pour something down your drain, do you know where it goes?

If your home is not on a municipal sewer or community septic system, your wastewater probably goes into an on-site sewage disposal system, commonly called a septic system. A septic system is designed to collect, treat and dispose of wastewater on site so that it can percolate into the ground without contaminating ground or surface waters. In Connecticut, nearly 40% of homes use some form of on-site sewage disposal system to treat and dispose of household wastewater.

Septic System Basics

When properly designed, installed and maintained, septic systems can actually treat wastewater so it meets drinking water standards. They also replenish groundwater and they are cost effective. All septic systems need regular maintenance. It is much less expensive to keep them operating properly through regular inspections and pumping than it is to replace them when they fail. With proper care a conventional septic system can last at least 20 years or longer.



The Septic Tank separates solids from liquids before sending wastewater to the leach field. A layer of sludge settles at the bottom and a layer of scum forms at the top, so only the clearest wastewater goes into the ground. Keeping solids in the tank and out of the leach field is the best way to prolong system life. That means the tank needs to be cleaned or pumped out periodically.

The Leach Field distributes the wastewater to the soil. They are usually constructed of two or more parallel, stone-lined ditches with perforated pipe. Liquid wastewater from the septic tank seeps into the soil and is treated by soil bacteria.

Septic System Dos & Don'ts

Do learn the location of your septic tank, distribution box, and leach field and create a sketch of it for future reference. Your local health department is a good place to start.

Do have your septic tank pumped out every two to five years (depending on capacity of tank and volume of usage). Have your system inspected to determine appropriate rate for your household.

Do conserve water and fix leaky faucets.

Do plant only grass over your leach field.

Do divert surface water away from system.

Do educate household members about the proper use of your septic system.

Don't flush or dispose of **any** solids other than human waste and toilet paper.

Don't dispose of medicines in drains.

Don't dispose of fats, grease or paint in drains.

Don't put strong chemical cleaners in drains.

Don't use septic system additives.

Don't drive over septic system components or leach field.

Keep a Record

Use the chart below to keep a record of your septic system maintenance and remind you of your next pump out.

Date	Work Done	Firm

For More Information Contact

Town(s)	Health Department/District
Woodbury Southbury Oxford	Pomperaug Health District 203-264-9616 http://pomperaughealthdistrict.org/
Bethlehem Kent Middlebury Morris Warren Watertown	Torrington Area Health District 860-489-0436 http://www.tahd.org/
New Milford	New Milford Health Department (860) 355-6035 http://www.newmilford.org/content/3088/3146/default.aspx
Washington	Washington Health Department 860-868-0423 www.washingtonct.org/health.html
Roxbury Newtown Bridgewater	Newtown Health District 203 270-4291 http://www.newtown-ct.gov/Public_Documents/NewtownCT_Health/index

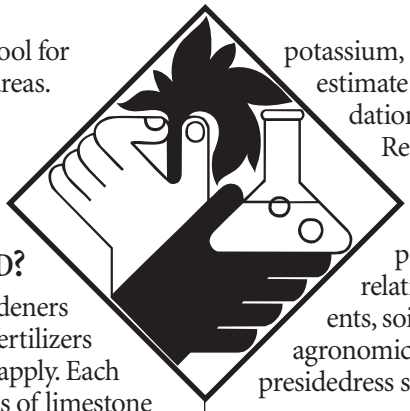
Soil Nutrient Analysis Laboratory

Soil Nutrient Analysis Laboratory, 6 Sherman Place, Unit 5102, Storrs, CT 06269-5102 • Phone: (860) 486-4274, Fax: (860) 486-4562
Location: Union Cottage, Depot Campus, Mansfield

Soil Testing for Lawns, Gardens and Commercial Crops

By Dawn Pettinelli, Manager, Soil Nutrient Analysis Laboratory

Soil testing is an inexpensive, yet valuable, tool for assessing the fertility of lawn and garden areas. Test results indicate the soil's pH level, the amounts of available plant nutrients, and the existence of nutrient imbalances, excesses or deficiencies.



Why Should I Have My Soil Tested?

Soil testing eliminates the guesswork many gardeners face when deciding the kinds and amounts of fertilizers or soil amendments they should purchase and apply. Each soil test report contains recommended amounts of limestone and/or fertilizer needed for optimum plant growth. Knowing how much to apply saves time and money.

It is a smart decision to test the soil every few years. Furthermore, it is particularly important in new garden bed installations or in established plantings that are not performing as well as expected. Regardless of whether you garden organically or use synthetic fertilizers, you will find that plants grow best when their nutritional requirements are met. This is achieved not only by the addition of nutrients such as nitrogen, phosphorus and potassium but also by sometimes modifying the soil's pH through the incorporation of limestone or sulfur.

Soil pH is a measurement of the acidity of the soil. A pH of 7.0 is neutral, below 7.0 is acidic, and above 7.0 is alkaline. Native soils tend to be acidic. It may be necessary to raise the pH by adding limestone. Plant species vary in their soil pH preference. Blueberries and broad-leaved evergreens, such as rhododendrons, may develop iron deficiencies if the soil pH is too high. Lack of calcium from low soil pH may contribute to the physiological condition known as blossom end rot, which affects tomatoes and summer squash.

Applying the proper amounts of limestone and fertilizer promotes healthy, productive plants. In addition, it minimizes the potential for water pollution from overapplication of nutrients, especially nitrogen and phosphorus.

What Can Soil Tests Determine?

The standard nutrient analysis will provide the soil sample's pH and the available amounts of phosphorus, potassium, calcium, magnesium, micronutrients and an estimate of total lead. Site specific fertilizer recommendations are provided based on the soil test results. Recommendations for modifying the soil pH with limestone or sulfur are made if necessary.

Separate analyses offered by the lab include: percent organic matter, particle size analysis (the relative amounts of sand, silt and clay), micronutrients, soilless media and soluble salts. Commercial agronomic or vegetable growers may be interested in our presidedress soil nitrate test.

What Can Soil Tests Not Determine?

The soil fertility test performed at the University of Connecticut cannot detect the presence of contaminants such as pesticides or petroleum products. A listing of state approved environmental laboratories which can perform these analyses is available at the Connecticut Department of Public Health's website, ***www.state.ct.us/dph***

Our soil tests also cannot identify problems due to insects, diseases, poor or excessive drainage, environmental stresses such as drought or winter injury, or improper cultural techniques.

When is the Best Time of Year to Have My Soil Tested?

A soil sample can be collected any time the ground is not frozen. The lab performs soil analyses year round. Fall is an optimal time for sampling because added amendments can begin to react with the soil over the winter. When submitting samples in the springtime, try to send them in early enough to give yourself time to prepare your beds before planting. Generally, the turnover time is 3 to 5 days in the lab but may be longer in April and May.

A soil test every 3 to 5 years is adequate for most situations. An exception to this would be sites requiring large nutrient additions or pH adjustments. In this case, it would be advisable to test one year after the recommendations for limestone and/or fertilizer were followed to monitor their effect. Whenever comparisons of results are desired, take samples at the same time of year.

University of Connecticut
DEPARTMENT OF PLANT SCIENCE
College of Agriculture and Natural Resources
COOPERATIVE EXTENSION SYSTEM

How Do I Get My Soil Tested?

Directions for sample collection, fees and mailing directions are listed in our free soil testing brochure that is available at your local **Cooperative Extension Center**, at the **UConn Home and Garden Education Center [toll-free (877) 486-6271]**, at some Connecticut garden centers or by calling the **Soil Nutrient Analysis Laboratory** at **(860) 486-4274**. You can also visit our web site, ***www.canr.uconn.edu/plsci/stlab.htm*** Those preferring the convenience of our prepaid soil test collection kit, can contact the lab. Soils in the prepaid kits receive the standard nutrient analysis. Kits are prepaid for the soil test, not for mailing, which usually costs less than $2 per sample.

Where Can I Get Answers to My Questions?

Specific plant-related questions or problems that are included with soil samples are submitted to the horticulturists at the **UConn Home and Garden Education Center** along with your soil test results. Questions regarding the results or recommendations can be directed to the **Soil Nutrient Analysis Laboratory**. Commercial growers should contact their Extension Specialist.

For additional information concerning soil testing contact:

Dawn Pettinelli, Manager
University of Connecticut Soil Nutrient Analysis Laboratory
6 Sherman Place, Unit 5102
Storrs, CT 06269
(860) 486-4274
dawn.pettinelli@uconn.edu

These locations stock both brochures and prepaid soil test collection kits:

Hartford County Extension Center (860) 570-9010
Litchfield County Extension Center (860) 626-6240
Middlesex County Extension Center (860) 345-4511
New London County Extension Center (860) 887-1608
Tolland County Extension Center (860) 875-3331
Windham County Extension Center (860) 774-9600

These locations have brochures only:

Fairfield County Extension Center (203) 207-3261
New Haven County Extension Center (203) 407-3161
Master Gardeners at the Bartlett Arboretum (203) 322-6971 ext. 15

The information in this material is for educational purposes. The recommendations contained are based on the best available knowledge at the time of printing. Any reference to commercial products, trade or brand names is for information only, and no endorsement or approval is intended. The Cooperative Extension System does not guarantee or warrant the standard of any product referenced or imply approval of the product to the exclusion of others which also may be available.

All agrochemicals/pesticides listed are registered for suggested uses in accordance with federal and Connecticut state laws and regulations as of the date of printing. If the information does not agree with current labeling, follow the label instructions. The label is the law.

WARNING! Agrochemical/pesticides are dangerous. Read and follow all directions and safety precautions on labels. Carefully handle and store agrochemical/pesticides in originally labeled containers out of reach of children, pets and livestock. Dispose of empty containers right immediately in a safe manner and place. Contact the Connecticut Department of Environmental Protection for current regulations.

The user of this information assumes all risks for personal injury or property damage.

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7/07

UCONN COOPERATIVE EXTENSION SYSTEM
College of Agriculture and Natural Resources

University of Connecticut

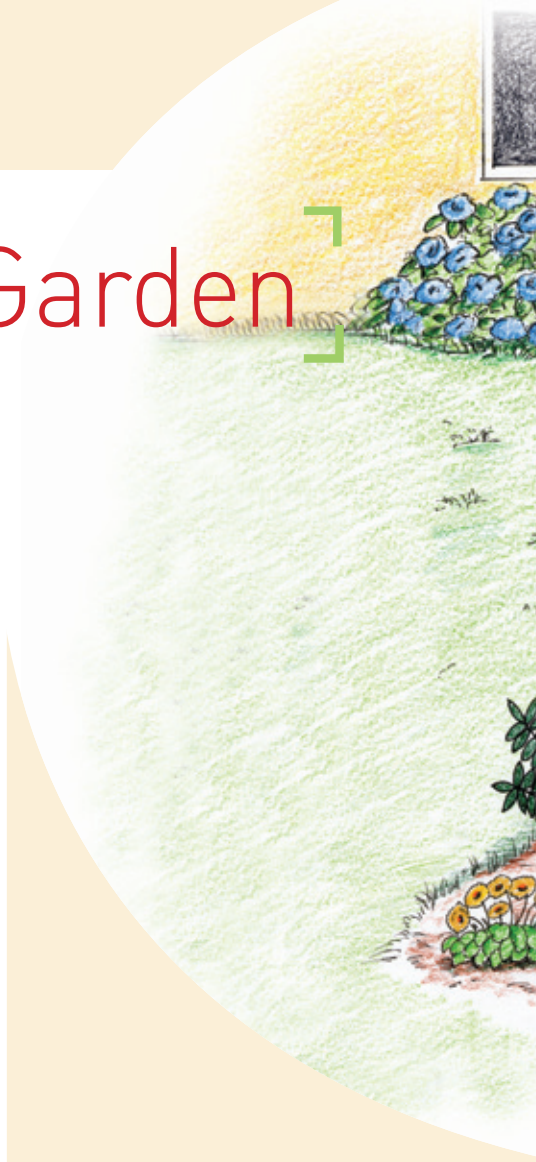
RAIN GARDENS

A DESIGN GUIDE FOR HOMEOWNERS

in Connecticut

Helping to improve water quality in your community.

Consider a Rain Garden



What is a rain garden?

It is a depression (about 6 inches deep) that collects runoff from a roof, driveway or yard and allows it to infiltrate into the ground. Rain gardens are typically planted with shrubs or perennials, and can be colorful, landscaped areas in your yard that will also provide important environmental benefits.

Why build a rain garden at your home?

You can make a difference! Every time it rains, water runs off impervious surfaces such as roofs, driveways, roads and parking lots, collecting pollutants along the way. This runoff has been cited by the United States Environmental Protection Agency as a major source of pollution to our nation's waterways. By building a rain garden at your home, you can reduce the amount of pollutants that leave your yard and enter nearby lakes, streams and ponds. As more rain gardens are installed, the amount of pollutants that reach the Long Island Sound will be lessened. We can all play a role in preserving the health of the Sound!

The intent of this brochure is to provide homeowners with an easy to use quick-reference tool for designing a rain garden at their home. Placement of the garden, sizing, installation, planting, and maintenance will be addressed.

Rain Gardens are beneficial to our environment in several ways. They:

- Reduce the amount of pollutants that wash into lakes, streams, ponds and wetlands.
- Help sustain adequate stream flow during dry spells through infiltration and recharge.
- Enhance the beauty of your yard and the neighborhood.
- Help protect communities from flooding and drainage problems.
- Reduce the need for costly municipal storm water treatment structures.

Adapted from University of Wisconsin Extension, Rain Gardens: A How-to Manual for Homeowners.

Concerns regarding rain gardens:

We often hear we should avoid standing water on our property to decrease the amount of mosquitoes. Won't a rain garden create an unwanted pond? No. A rain garden IS NOT a pond. A properly designed rain garden will hold water for only about 6 hours after a storm. Mosquitoes need much more time than this to lay and hatch eggs.

Will it be expensive or difficult to install or maintain at my house? Once the shallow depression (about 6 inches) is dug for the rain garden, it won't be any more expensive than planting other landscaped areas in your yard. Most of the recommended plants can be purchased at local nurseries, and once established, you maintain them just like any other plants in your yard.

Designing your garden

Take some time to consider placement of your rain garden. It is important to locate your garden where it will collect the most amount of runoff possible. Placing your rain garden downhill from paved surfaces where water would naturally flow will maximize its ability to collect runoff.

Some questions to answer at this point may be:

- *Will the garden be close enough to the downspout to install a pipe without having the pipe be in the way or look out-of-place?*
- *Does the overall shape of the garden fit with the rest of my yard? Rain gardens are versatile; they can be any size or shape imaginable.*

STEP 1 Placement of the rain garden

Here are some factors to consider when locating your rain garden:

- To avoid potential water problems, rain gardens should not be placed closer than about 10 feet from the foundation of a house with a basement.
- Do not build/locate the rain garden over a septic system, or very close to a water supply or well.
- Avoid placing the rain garden in a low spot in the yard that always seems wet. Remember, a rain garden is not a water garden. Placing it in poorly drained soils may lead to slow infiltration and unwanted long term ponding.
- It is easier to construct and maintain a rain garden in a flat or slightly sloped area. For highly sloped areas there are alternative designs. [See pages 1-25 in the Prince George's County Bioretention Manual.]

http://www.goprincegeorgescounty.com/government/agencyindex/der/esd/bioretention/bioretention.asp

STEP 2 Soils

One way to determine if the soils are suitable at your rain garden site is to perform a small percolation test. Dig a hole about 6 inches deep and fill it with water. If there is still water in the hole after 24 hours, the site is not suitable for a rain garden. **The sizing method on the following page is suited for loamy or sandy soils where water infiltrates easily.**

STEP 3

Sizing

This sizing method is designed to capture the majority (more than 90%) of runoff from the roof. If a gutter downspout will run directly into the garden, the only information that you will need is the area of the roof that contributes to that gutter. Don't worry, this doesn't require a trip to the roof!

- Just measure the footprint of your house (the area taken up by your house if you were looking down from above).
- Then, estimate how much of this area actually contributes to the gutter downspout. In other words, if it were raining, what portion of the roof area would be contributing water to the garden?
- Next, divide this area by 6. This calculation sizes the garden to hold one inch of roof runoff in a garden 6 inches deep. This is the area you need for your rain garden (see example on the following page).

If you are placing the garden in an area of lawn, and the runoff from your downspouts travels over more than 30 feet before it gets to your garden, the garden may not need to be as large. Some water will sink into the grass before entering the garden. However, if there is a large area of grass that will also contribute runoff to the rain garden, consider using the size calculated above. While it won't hurt to have the garden be a bit larger than necessary, if size or cost is a constraint, the garden can be smaller and still provide some treatment. Every little bit helps!

If the percolation test shows that your soils are suitable, or if you know that the soils are loamy/sandy, then you can move on to the installation section. Even with soils that are silty or clayey, you can still have a rain garden. Remember, if the soils are poorly drained, or your test hole still had water after 24 hours, the site is not suitable for a rain garden. If there was some infiltration but it was slow, increasing the size of your garden can make up for the tight soils. With silty soils, the size can be increased about 50%. If the soils are clayey, the size can be increased up to 100%. This increase will provide the same amount of treatment as if your soils were sandy. However, if an increased size is not feasible due to cost or space constraints, don't worry. You will still be providing some treatment of the runoff, and therefore a benefit to the local waterways.

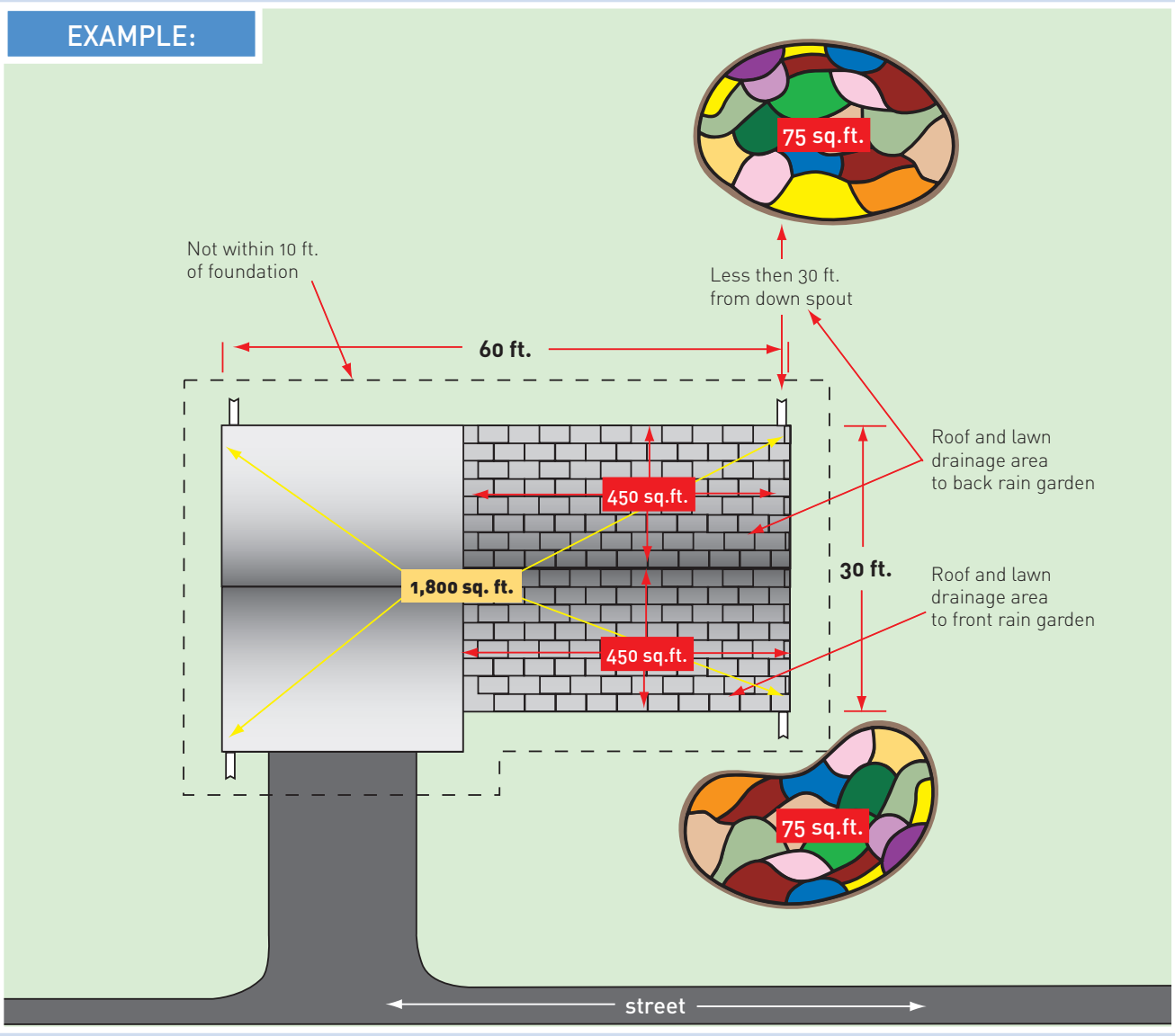
A more detailed design manual with accommodations for silty or clayey soils can be found at the following website:
http://www.dnr.state.wi.us/org/water/wm/nps/rg/#plant_lists

Calculating the size of your rain garden

Based on the amount of roof runoff from your home.

The house has a footprint of **60 feet x 30 feet, or 1800 ft²**. One quarter of the roof area contributes to the gutter near where the rain garden is to be built. So the contributing area would be **1800 ft² x 0.25 = 450 ft²**. This area is then divided by 6, so that the square footage of the rain garden would be: **450 ft² / 6 = 75 ft²**. A nicely shaped rain garden might be **10 ft x 7.5 ft**. However, you have the flexibility to make it any shape you want, as long as you approximate the size.

EXAMPLE:



Diagrams above dapted from the University of Wisconsin Extension, Rain Gardens: A How-to Manual for Homeowners.

STEP 4

Installation

Now it's time to start digging! Smaller gardens can be dug by hand with a shovel, or equipment can be rented for larger gardens. Most gardens for average sized homes can be dug by hand if you are in good health, or have some extra help.

Before digging, be sure to call the "Call Before You Dig" hotline to locate any underground utilities:

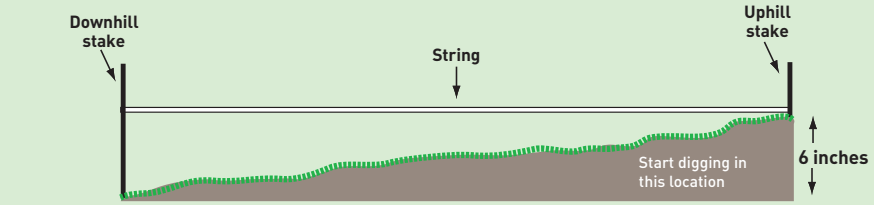
1-800-922-4455

Once you feel confident in the placement of the garden, **lay out the shape to define where to dig**. A string can be helpful for this. If the yard is fairly level, you can just dig out the bowl to the proper depth, which is 6 inches deep, or a couple of inches deeper if mulch will be used. If the yard is sloped, you may need to construct a small berm (mound) at the downslope side of the garden to prevent the soil from washing away after a storm. Use the soil that was removed from upslope side of the garden and add it to the downslope side.

The bottom of the garden should be fairly level to maintain the storage area inside the garden. A string or board can be helpful for this: just lay either across the garden (make sure the string is tight) at the level of the lawn, and measure down with a tape measure. **Slope the edges of the garden**, but don't make them too steep. Steep slopes tend to erode easily. Mulch or a ground cover will help to stabilize the soils.

WHERE TO DIG

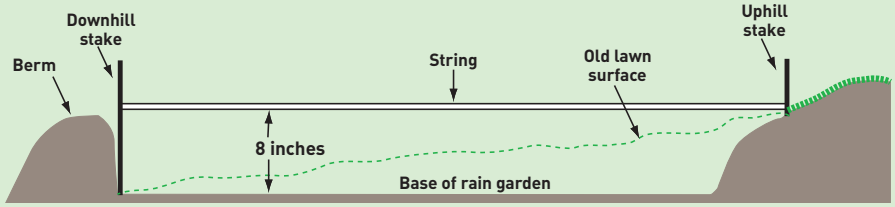
Diagram illustrates before digging has occurred.



Adapted from University of Wisconsin Extension, Rain Gardens: A How-to Manual for Homeowners.

WHERE TO PUT THE SOIL YOU'VE DUG

Diagram illustrates after digging has occurred.



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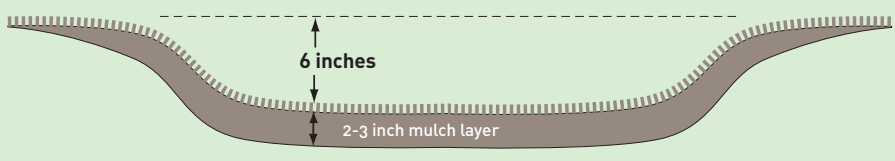
CROSS SECTION OF RAIN GARDEN



A word on newer houses...

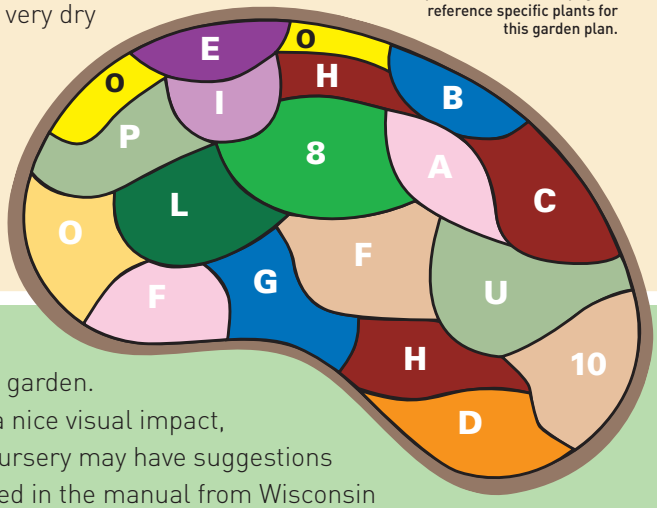
If you have a newer house or if heavy equipment has been used in the area of the rain garden, you may want to loosen up the soil with a rototiller, or by hand, to allow water to soak in more easily. In this situation or any other rain garden, compost or other soil conditioner can be added to enhance plant growth. Just dig the garden a bit deeper to account for the added material.

STEP 5

Planting

Now it's time to plant! The plants that tend to do well in rain gardens are the ones that can tolerate wet conditions, but also very dry conditions. Many plants that are native to Connecticut fit this description. Refer to page 9 for a list of perennials and shrubs (that will do well in most locations in full sun to partial shade), for Connecticut rain gardens. The list is from John Alexopoulos, Landscape Architecture Program at the University of Connecticut.

Sample layout
See plant list on the next page to reference specific plants for this garden plan.

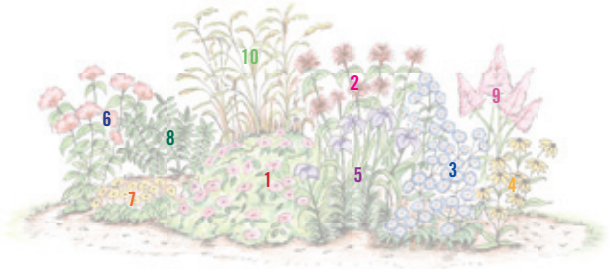


There are many ways to combine plants in a rain garden. Groupings of the same species tend to produce a nice visual impact, but it's really up to you. Be creative! Your local nursery may have suggestions for design layouts, and several examples are listed in the manual from Wisconsin mentioned on page 5. **See illustration below for an example of plant selections you could use for your rain garden.**

After planting, a vegetative ground cover or hardwood mulch can be applied to reduce weeds and conserve moisture. If using mulch, make sure that it is shredded hardwood, since pine bark chips tend to float. **See cross section diagram on page 7.**

Plants selection:

1. Swamp Azalea
2. Cardinal Flower
3. New York Aster
4. Black-Eyed Susan
5. Iris
6. Joe Pyeweed
7. Lanceleaf Coreopsis
8. Royal Fern
9. Astilbe
10. Switch Grass



Sample layout
See plant list on the next page to reference specific plants for this garden plan.

Suggested plant list for Connecticut rain gardens

PERENNIALS

A. Swamp milkweed *(Asclepias incarnata)*
B. New York aster *(Aster novae-belgii)*
C. Astilbe *(Astilbe spp.)*
D. Tickseed sunflower *(Bidens aristosa)*
E. Joe Pye weed *(Eupatorium fistulosum)*
F. Rose mallow *(Hibiscus moscheutos)*
G. Iris *(Iris versicolor)*
H. Cardinal flower *(Lobelia cardinalis)*
I. Spiked gay feather *(Liatris spicata)*
J. Sensitive fern *(Onoclea sensibilis)*
K. Cinnamon fern *(Osmunda cinnamomea)*
L. Royal fern *(Osmunda regalis)*
M. Marsh fern ***(Thelypteris palustris)***
N. Spiderwort *(Tradescantia virginiana)*
O. Black-Eyed Susan *(Rudbeckia birta)*

GRASSES

P. Creeping bentgrass *(Agrostis stolonifera)*
Q. Meadow foxtail *(Alopecurus pratensis)*
R. Blue joint *(Calamogrostis Canadensis)*
S.Tussock sedge *(Carex stricta)*
T. Tufted hair grass *(Deschampsia caespitosa)*
U. Switch grass *(Panicum virgatum)*
V. Ribbon grass *(Phalaris arundinacea)*

SHRUBS

1. Red chokeberry *(Aronia arbutifolia)*
2. Buttonbush *(Cephalanthus occidentalis)*
3. Summersweet clethra *(Clethra alnifolia)*
4. Silky dogwood *(Cornus amomum)*
5. Gray dogwood *(Cornus racemosum)*
6. Red osier dogwood *(Cornus sericea)*
7. Inkberry *(Ilex glabra)*
8. Winterberry *(Ilex verticillata)*
9. Spicebush *(Lindera aestivale benzoin)*
10. Pinxterbloom azalea *(Rhododendron periclymenoides)*
11. Swamp azalea *(Rhododendron viscosum)*
12. Elderberry *(Sambucus Canadensis)*
13. Lowbush blueberry *(Vaccinium angustifolium)*
14. Highbush blueberry *(Vaccinium corymbosum)*
15. Witherod *(Viburnum cassinoides)*
16. Arrowwood *(Viburnum dentatum)*
17. Nannyberry *(Viburnum lentago)*
18. Black haw *(Viburnum prunifolium)*
19. American cranberry *(Viburnum trilobum)*

One or more trees can be added to a rain garden, depending upon its size. Caution should be used though, as a tree can quickly take over the garden and create a different look. Remember, most trees will grow very large unless they are purposely kept small. If a tree is desired, the following types are recommended:

TREES

20. River birch *(Betula negra)*
21. Red maple *(Acer rubrum)*
22. Sweetgum *(Liquidambar styraciflua)*
23. Swamp white oak *(Quercus bicolor)*
24. Pin oak *(Quercus palustris)*
25. Larch *(Larix laricina)*
26. Cottonwood *(Populus deltoides)*
27. Shadblow *(Amelanchier spp.)*
28. Green ash *(Fraxinus pennsylvanica)*

Helping to improve water quality in your community.

STEP 6

Maintenance

Maintaining your rain garden is not really much different from maintaining any other newly planted landscaped area. Plants will need to be watered until established, and weeding should be performed as necessary. In the years following installation, removal of dead plant material, and replacement of mulch can be performed. Shrubs can be pruned, if desired, but it is not necessary.

Now you can sit back and enjoy the beauty of your rain garden, and also know that it is performing an important function in the protection of our water resources!

RAIN GARDENS

BENEFICIAL | ATTRACTIVE | EASY

University of Connecticut
College of Agriculture and Natural Resources
Cooperative Extension System

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Associate Professor of Plant Science
University of Connecticut
for providing the plant list.

Rain Gardens in Connecticut: A guide for homeowners is available from county Cooperative Extension offices, and online at

www.sustainability.uconn.edu
or
www.nemo.uconn.edu

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RAIN GARDENS

BENEFICIAL | ATTRACTIVE | EASY

WHERE TO DIG

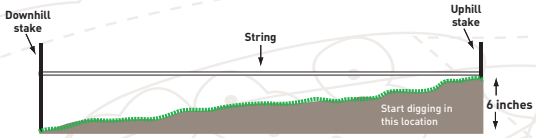


Diagram illustrates before digging has occurred.

WHERE TO PUT THE SOIL YOU'VE DUG

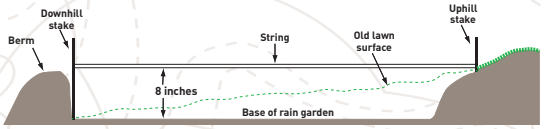


Diagram illustrates after digging has occurred.

Illustrations adapted from University of Wisconsin Extension, Rain Gardens: A How-to Manual for Homeowners.

RAIN GARDENS *in* CONNECTICUT

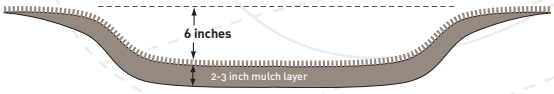
A QUICK REFERENCE GUIDE FOR INSTALLATION AND PLANT SELECTION FOR A HOME RAIN GARDEN

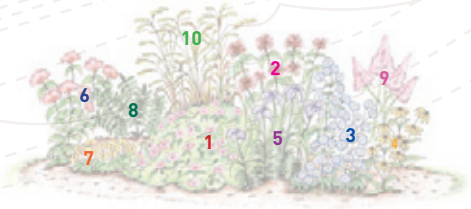
Helping to improve water quality in your community.

Sample Layout

See plant list on the back of the card to reference specific plants for this garden plan.

CROSS SECTION OF A RAIN GARDEN





NEMO

NEW ENGLAND Regional Water Quality Program

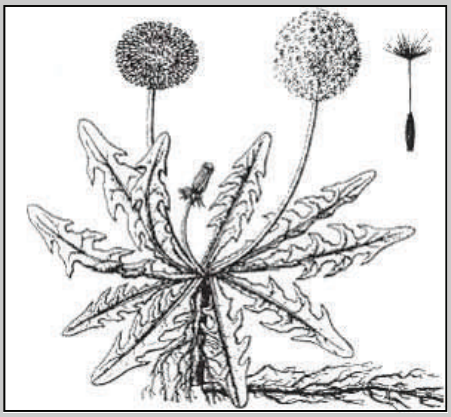
University of Connecticut
College of Agriculture and Natural Resources
Cooperative Extension System

Residential Water Quality
University of Connecticut
Cooperative Extension System

CONNECTICUT DEPARTMENT ENVIRONMENTAL PROTECTION

What Your Weeds Say About Your Lawn

Dandelion (Taraxacum officinale):



Your lawn is a traditionalist. Perhaps you have children that love to blow the seeds everywhere.
Likes: Moist weather, acidic soil, and a lawn that is mowed too low
Control Methods: Mow high, hand weed starting early spring, and raise your soil's calcium levels. Edible

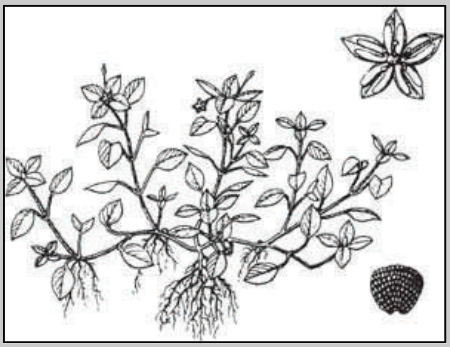
Crabgrass (Digitaria sanguinalis.):

Your lawn values loyalty, this crabgrass has been here since you moved in along the front walk and it's not going anywhere.
Likes: Compacted soil, thrives in hot weather, often found along driveways and walkways and tight spots (along sidewalk cracks).
Control Methods: Aeration is key, do it in the spring and then add compost and reseed.

White Clover (Trifolium repens):

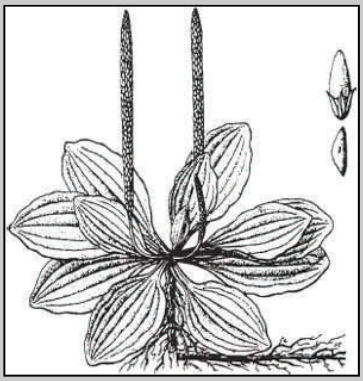
Your lawn is optimistic, it is hoping you will fix it's soil chemistry so that it will stop having to do it for you.
Likes: sunny spots low in nitrogen and high in phosphorus and moist, low fertility soils.
Benefits: Fixes nitrogen. Good bee nectar source
Control Methods: Add nitrogen and decrease phosphorous, mow high, mow off flower heads.

Common chickweed (Stellaria media):



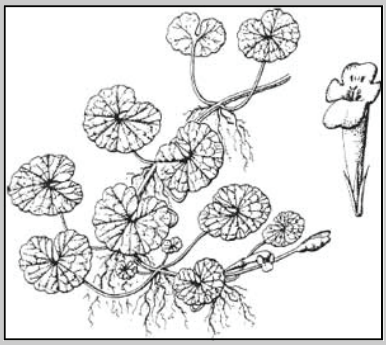
Your lawn is a nature-lover, more specifically, a bird lover. This plant is a favorite for many types of birds.
Likes: Shady, compacted, tight soil.
Control Methods: Add compost, organic material and overseed. When weeding, pull plants completely. Edible, used as an herb.

Broadleaf plantain (Plantago major):



Your lawn is patient, it is waiting for you to discover that not only is this plant maintaining your lawn fertility, but that you can use this plant to treat insect bites and poison ivy. Butterfly caterpillars love this plant.
Likes: Compacted soil and moist areas.
Control methods: Aerate soil, avoid over-watering, and hand weed. Otherwise, get used to it. Edible

Ground ivy (Glecoma hederacea):



Your lawn is just creepy, or more specifically Creeping Charlie. This weed just spreads like crazy, creeping along in long rows.
Likes: moist compacted soil, shady location. Low nitrogen, high calcium.
Control Methods: Fertilize in fall, overseed and mow high. Aerate. Borax can be used as well: 10 oz. diluted in 3 gallons of water sprayed evenly over 1,000 sq ft of lawn. Edible

Thanks to the *NOFA Organic Lawn and Turf Handbook* for the great information on weeds. Pictures from Penn State 's Turfgrass management extension office.

APPENDIX D

ANNUAL REPORT

Weston & Sampson

westonandsampson.com

273 Dividend Road
Rocky Hill, CT 06067
tel: 860.513.1473

REPORT

February 2017

TOWN OF
Thomaston
CONNECTICUT

2016 Stormwater Annual Report (Year 13)

CTDEEP General Permit for the Discharge of Storm Water from Small Municipal Separate Storm Sewer Systems (MS4)

Prepared for: Thomaston, Connecticut
Registration Number: GSM# 000039

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INTRODUCTION / OVERVIEW

I.1 INTRODUCTION

This Annual Report comprises the Town's Stormwater Management Plan (SWMP) for 2016 (Year 13), and it was developed by the Town of Thomaston for the purpose of reporting the status of compliance with the CTDEEP General Permit (GP) for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems. The report includes an assessment of the appropriateness of the identified best management practices in the SWMP and the Part B registration, and the progress towards achieving the implementation dates and measurable goals for each of the Minimum Control Measures.

Additional information contained in this report includes all other information collected and analyzed under Section 6(a)(3) of the GP collected during the reporting period, all monitoring data collected and analyzed in accordance with Section 6(h) of the GP, a summary of the stormwater activities the Town plans to undertake during the next reporting period, and any change in identified measurable goals or implementation dates applicable to program elements.

Per the Town's request, the report format is based on and follows previous formats established by preceding consultants. Similarities in language, format, content, and recommendations are intentional in order to maintain consistency with previous reports and established approaches.

I.2 TOTAL MAXIMUM DAILY LOAD (TMDL)

A Total Maximum Daily Load (TMDL) analysis was completed for indicator bacteria in the Naugatuck River Regional Basin. The Naugatuck River is listed on the CT "*Impaired Waters List*" due to exceedences of the indicator bacteria criteria contained within the State *Water Quality Standards*. Under section 303(d) of the Federal Clean Water Act (CWA), States are required to develop TMDLs for waters impacted by pollutants for which technology-based controls are insufficient to achieve water quality standards, and the TMDLs are included on their Impaired Waters Lists. Generally speaking, the TMDL represents the maximum loading that a waterbody can receive without exceeding the water quality criteria, which have been adopted into the WQS for that parameter. The TMDL analysis is a management tool used to restore impaired waters by establishing the maximum amount of a pollutant that a waterbody can receive without adverse impacts to fish, wildlife, recreation, or other public uses, and provides guidance for responsible parties to use as a framework for developing a TMDL implementation plan. The "Total Maximum Daily Load Analysis for Recreational Uses of the Naugatuck River Regional Basin" report was approved by the Environmental Protection Agency on June 6, 2008. In accordance with Section 6(k) of the MS4 Permit, municipalities that discharge to TMDL waterbodies must modify their Stormwater Management Plans to address the

TMDL. Since the Town of Thomaston is located in the middle of the Naugatuck River Regional Basin, they are required to adhere to all TMDL requirements.

This report will focus on both the MS4 and TMDL program requirements. The MS4 and TMDL program requirements include the following six control measures:

1. Public education and outreach;
2. Public participation;
3. Illicit discharge detection and elimination (IDDE);
4. Construction stormwater management (greater than 1 acre);
5. Post-construction stormwater management;
6. Pollution prevention and good housekeeping

I.3 ANNUAL REPORT DEVELOPMENT TEAM

As part of the preparation of the Annual Report, a project team was established with representatives of the town and the town's consultant for this assignment, Weston & Sampson Engineers, Inc. (Weston & Sampson)

During the preparation of the Annual Report, the development team met to discuss the status of the SWMP, its best management practices (BMPs), measurable goals and implementation dates. Specifically, the tasks that were completed during the year 2016 and tasks to be undertaken in the year 2017 were discussed in detail so accurate information could be provided in the Annual Report. A list of the project team is provided below.

Table I.1 ANNUAL REPORT DEVELOPMENT TEAM

Name	Organization & Title
Glenn Clark	Town of Thomaston Superintendent of Roads
Christopher Wester, P.E.	Weston & Sampson Vice President
Jeffrey Willson, LEP	Weston & Sampson Project Manager

EXECUTIVE SUMMARY

ES.1 INTRODUCTION

Six minimum control measures are required to be included in the SWMP to satisfy the requirements of the NPDES Phase II program and CTDEP's General Permit for the Discharge of Stormwater from Small Municipal Storm Sewer Systems and the recently implemented Total Maximum Daily Load (TMDL) program requirements. Specific BMPs for each minimum control measure must be selected and incorporated into the plan, and eventually implemented as part of the Town's stormwater management program.

The SWMP that was previously developed by the town outlines a plan of BMPs and measurable goals for each of the six (6) minimum control measures that consist of:

1. Public Education and Outreach
2. Public Involvement / Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff Control
5. Post Construction Stormwater Management
6. Pollution Prevention / Good Housekeeping.

The plan requires that a combination of tasks be undertaken to carry out the BMPs selected for each measure. This includes development of specific programs and products, conducting public information meetings, documentation of ordinances, policies, procedures and training, development of a storm sewer system map, outfall testing, development of new training, and additional maintenance requirements.

The BMPs selected for each minimum control measure are summarized and briefly described in this report. Specific details for each BMP including measurable goals, implementation dates, status, dates completed and positions responsible are stated in each of the respective minimum control measures in this report. The First Selectmen and Superintendent of Roads will be responsible for implementation and future enforcement of each of the BMPs for the six minimum control measures.

This Annual Report will summarize the status of compliance with the TMDL program requirements, the CTDEEP General Permit for the Discharge of Stormwater Associated with Small Municipal Separate Storm Sewer System for each of the BMPs listed in the SWMP and in the Part B registration for the permit. The report includes an assessment of the appropriateness of the identified best management practices in the SWMP and Part B registration and the progress towards achieving the implementation dates and measurable goals for each of the Minimum Control Measures.

The program requirements for the MS4 and the TMDLs are consistent. The stormwater management plan developed for Year 5 was modified from previous

years to incorporate requirements from both programs. The TMDL program has been implemented utilizing an iterative management approach. The first step to complying with the TMDLs involved modifying the stormwater sampling plan to focus on stormwater discharges that outlet into the Naugatuck River and the Naugatuck River itself to establish a benchmark. Once established, the benchmark has allowed the Town to focus on problem areas and tailor its Stormwater Management Plan to remedy to problem areas. The stormwater samples for Year 9 included 2 locations along the Naugatuck River, and 4 locations throughout the Town, each of which ultimately discharges into the Naugatuck River.

ES.2 ANNUAL REPORT REQUIREMENTS AND SUBMISSION DATES

The Annual Report must meet the requirements of General Permit and be submitted by January 1 following the reporting year. The report along with all other pertinent records associated with the General Permit and SWMP must be kept for at least 5 years following the expiration of the General Permit. The annual report and SWMP must be available to the public at reasonable times during regular business hours. A draft copy of the Annual Report must also be made available for public review at least 30 days prior to submission.

SECTION 1 – PUBLIC EDUCATION AND OUTREACH

The following BMPs were selected by the town to address the Public Education and Outreach minimum control measure of the General Permit:

1. Brochures / Fact Sheets
2. Town Website
3. Library of Educational Materials
4. Storm Drain Marking / Stenciling
5. Tributary Signage

Based upon the progress made during the first twelve reporting years and feedback from town employees and the public, it appears that these BMPs are appropriate. The following tables detail the progress made during the reporting period towards achieving the implementation dates and measurable goals for this minimum control measure.

1.1 BROCHURES / FACT SHEETS

Table 1.1 Brochure / Fact Sheet BMP Measurable Goals, Implementation Dates & Status				
Target Date	**Status / Completed - Date**		**Measurable Goal / Activity**	**Responsible Dept. or Person**[1]
	YES	**NO (Reason)**		
Year 1 (2004)	YES – Year 1 Collected CTDEP & EPA Materials		Develop and or collect brochure / fact sheet	LUA / WM
Year 2 (2005)	YES - Year 2 Displayed in First Selectmen's Office and Land Use Office. Displayed at 3 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at Town Hall	LUA / WM
Year 3 (2006)	YES - Year 3 Displayed in First Selectmen's Office and Land Use Office. Displayed at 3 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 1 meeting each for Conservation Commission, Inland Wetlands and Watercourse Commission and Planning and Zoning Commission	LUA / WM
Year 4 (2007)	YES - Year 4 Displayed in First Selectmen's Office and Land Use Office. Displayed at 3 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 3 public information meetings and hearings for Conservation Commission, Inland Wetlands and Watercourse Commission and Planning and Zoning Commission	LUA / WM
Year 5 (2008)	Yes - Year 5 Displayed in First Selectmen's Office and Land Use Office. Displayed at 6 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, Inland Wetlands and Watercourse Commission and Planning and Zoning Commission	LUA / WM
Year 6 (2009)	Yes - Year 6 Displayed in First Selectmen's Office and Land Use Office. Displayed at 6 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, Inland Wetlands and Watercourse Commission and Planning and Zoning Commission	LUA / WM
Year 7 (2010)	Yes - Year 7 Displayed in First Selectmen's Office and Land Use Office. Displayed at 6 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, Inland Wetlands and Watercourse Commission and Planning and Zoning Commission	LUA / WM
Year 8 (2011)	Yes - Year 8 Displayed in First Selectmen's Office and Land Use Office. Displayed at 6 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, Inland Wetlands and Watercourse Commission and Planning and Zoning Commission	LUA / WM
Year 9 (2012)	Yes - Year 9 Displayed in First Selectmen's Office and Land Use Office. Displayed at Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, Inland Wetlands and Watercourse Commission and Planning and Zoning Commission	LUA / WM

Year 10 (2013)	Yes - Year 10 Displayed in First Selectmen's Office and Land Use Office. Displayed at Inland Wetlands Meetings	Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, Inland Wetlands and Watercourse Commission and Planning and Zoning Commission	LUA / WM
Year 11 (2014)	Yes - Year 11 Displayed in First Selectmen's Office and Land Use Office. Displayed at Inland Wetlands Meetings	Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, Inland Wetlands and Watercourse Commission and Planning and Zoning Commission	LUA / WM
Year 12 (2015)	Yes – Although posting of Annual Report on web was delayed. Brochures displayed in First Selectmen's Office and Land Use Office and at Inland Wetlands Meetings	Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, Inland Wetlands and Watercourse Commission and Planning and Zoning Commission	LUA / WM
Year 13 (2016)	Yes – Brochures displayed in First Selectmen's Office and Land Use Office and at Inland Wetlands Meetings	Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, Inland Wetlands and Watercourse Commission and Planning and Zoning Commission	LUA / WM

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

1.2 TOWN WEBSITE

Table 1.2 Town Website BMP Measurable Goals, Implementation Dates & Status				
Target Date	**Status / Completed - Date**		**Measurable Goal / Activity**	**Responsible Dept. or Person**
	YES	**NO (Reason)**		
Year 1 (2004)	NO – Partial Draft SWMP Posted		Post SWMP, links and additional information of website	LUA / WM
Year 2 (2005)	NO - Final SWMP, Links and Educational Materials to be posted in Year 3 as a result of update to Town's entire website.		Post Final SWMP, 2004 Annual Report, links and additional information of website	LUA / WM
Year 3 (2006)	YES - Links and Educational Materials need to be added in Years 4 & 5		Update website as required	LUA / WM
Year 4 (2007)	YES - Educational links and materials added to website		Updated Town website to be published January 2008	LUA / WM
Year 5 (2008)	YES - Website has been maintained and updated accordingly		Maintain and Update the website	LUA / WM
Year 6 (2009)	YES - Website has been maintained and updated accordingly		Maintain and Update the website	LUA / WM
Year 7 (2010)	YES - Website has been maintained and updated accordingly		Maintain and Update the website	LUA / WM
Year 8 (2011)	YES - Website has been maintained and updated accordingly		Town website updated Jan. 2011; updated links to educational materials posted along with Year 7 Annual Report	LUA / WM
Year 9 (2012)	YES - Website has been maintained although Annual Report's posting was delayed		Maintain and Update the website	LUA / WM
Year 10 (2013)	YES - Website has been maintained although Annual Report's posting was delayed		Maintain and Update the website	LUA / WM
Year 11 (2014)	YES - Website has been maintained although Annual Report's posting was delayed		Maintain and Update the website	LUA / WM
Year 12 (2015)	YES - Website has been maintained although Annual Report's posting was delayed		Current plans are to update the website in 2016. All links to education materials will be updated.	LUA / WM
Year 13 (2016)	YES - Website has been maintained and updated accordingly.		Current plans are to update the General Permit in 2017.	LUA / WM

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

1.3 LIBRARY OF EDUCATIONAL MATERIALS

Table 1.3 Library of Educational Materials BMP Measurable Goals, Implementation Dates & Status				
Target Date	**Status / Completed - Date**		**Measurable Goal / Activity**	**Responsible Dept. or Person**
	YES	**NO (Reason)**		
Year 1 (2004)	YES – Year 1 - CTDEP & EPA Materials Collected		Collect data and information	SOR / LUA
Year 2 (2005)	YES – Year 2 - Materials available in First Selectmen's Office and Land Use Office		Establish library and make materials available to town employees and public	SOR / LUA
Year 3 (2006)	YES – Year 3 - Materials available in First Selectmen's Office and Land Use Office		Maintain library	SOR / LUA
Year 4 (2007)	YES – Year 4 - Materials available in First Selectmen's Office and Land Use Office		Maintain library	SOR / LUA
Year 5 (2008)	YES – Year 5 - Materials available in First Selectmen's Office and Land Use Office		Maintain library	SOR / LUA
Year 6 (2009)	YES – Year 6 - Materials available in First Selectmen's Office and Land Use Office		Maintain library	SOR / LUA
Year 7 (2010)	YES – Year 7 - Materials available in First Selectmen's Office and Land Use Office		Maintain library	SOR / LUA
Year 8 (2011)	YES – Year 8 - Materials available in First Selectmen's Office and Land Use Office		Maintain library	SOR / LUA
Year 9 (2012)	YES – Year 9 - Materials available in First Selectmen's Office and Land Use Office		Maintain library	SOR / LUA
Year 10 (2013)	YES – Year 10 - Materials available in First Selectmen's Office and Land Use Office		Maintain library	SOR / LUA
Year 11 (2014)	YES – Year 11 - Materials available in First Selectmen's Office and Land Use Office		Maintain library	SOR / LUA
Year 12 (2015)	YES – Year 12 - Materials available in First Selectmen's Office and Land Use Office		Maintain library	SOR / LUA
Year 13 (2016)	YES – Year 13 - Materials available in First Selectmen's Office and Land Use Office		Maintain library	SOR / LUA

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

1.4 STORM DRAIN MARKING / STENCILING

Table 1.4 Storm Drain Marking / Stenciling BMP Measurable Goals, Implementation Dates & Status				
Target Date	**Status / Completed - Date**		**Measurable Goal / Activity**	**Responsible Dept. or Person**
	YES	**NO (Reason)**		
Year 1 (2004)	YES – Year 1 Markers collected and locations identified		Collect materials from CTDEP and identify appropriate locations for installation	SOR
Year 2 (2005)	YES – Year 2 Markers installed on 37 catch basins		Install storm drain markers / stencils	SOR
Year 3 (2006)	YES – Year 3 Markers installed on 40 additional catch basins		Install storm drain markers / stencils	SOR
Year 4 (2007)	YES – Year 4 Markers installed on 32 additional catch basins		Install storm drain markers / stencils	SOR
Year 5 (2008)	YES – Year 5 Markers installed on 50 additional catch basins		Install storm drain markers / stencils	SOR
Year 6 (2009)	YES – Year 6 Markers installed on 25 additional catch basins		Install storm drain markers / stencils	SOR
Year 7 (2010)	YES – Year 7 Markers installed on 20 additional catch basins		Install storm drain markers / stencils	SOR
Year 8 (2011)	NO – Year 8 (Town resources focused on road program and storm cleanup. MS4 activities will resume in 2012.)		Install storm drain markers / stencils	SOR
Year 9 (2012)	NO – Year 9 - (Town resources focused on road program. MS4 activities will resume in 2013.)		Install storm drain markers / stencils	SOR
Year 10 (2013)	NO – Year 10 – Lack of Town resources / personnel.		Install storm drain markers / stencils	SOR
Year 11 (2014)	NO – Year 11 – Lack of Town resources / personnel.		Install storm drain markers / stencils	SOR
Year 12 (2015)	YES – Year 12 – Markers installed on 50 catch basins.		Install storm drain markers / stencils	SOR
Year 13 (2016)	YES – Year 13 – Markers installed on 70 catch basins.		Install storm drain markers / stencils	SOR

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

1.5 TRIBUTARY SIGNAGE

Table 1.5
Tributary Signage BMP
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	NO – Lack of Town Resources To be completed in Year 2		Develop tributary signage program and identify locations for installation	SOR
Year 2 (2005)	YES – Partial 2 suitable locations identified. 2 Signs to be ordered and installed in Year 3.		Install tributary signage at 1 location	SOR
Year 3 (2006)	YES – Partial 1 Sign installed at Unnamed Tributary to Branch Brook		Install tributary signage at 2 locations	SOR
Year 4 (2007)	YES - 2 Signs installed at Unnamed Tributary to Branch Brook and Unnamed Tributary to Naugatuck River		Install tributary signage at 2 locations	SOR
Year 5 (2008)	YES – 2 Signs installed at Unnamed Tributary to Branch Brook, 1 Sign at Unnamed Tributary to Thomaston Reservoir and 1 Sign at Unnamed Tributary to Naugatuck River		Install tributary signage at 4 locations, 2 signs along Old Northfield Rd, 1 along Altar Avenue and 1 sign along West Hill Rd.	SOR
Year 6 (2009)	YES – 2 Signs installed at Unnamed Tributaries		Install tributary signage at 2 locations	SOR
Year 7 (2010)	YES – 6 Signs installed at 3 Tributary locations (Altair Avenue, Old Northfield Road, and West Hill Road)		Install tributary signage at 3 locations	SOR
Year 8 (2011)	NO – (Town resources focused on road program and Hurricane Irene & October Nor'easter cleanup - MS4 activities will resume in 2012.)		None added	SOR
Year 9 (2012)	YES – Inspected installed signs		None added	SOR
Year 10 (2013)	YES – Inspected installed signs		None added	SOR
Year 11 (2014)	YES – Inspected installed signs		None added	SOR
Year 12 (2015)	YES – Inspected installed signs		None added	SOR
Year 13 (2016)	YES – Inspected installed signs		None added	SOR

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

SECTION 2 – PUBLIC INVOLVEMENT / PARTICIPATION

The following BMPs were selected by the town to address the Public Involvement / Participation minimum control measure of the General Permit:

- Public Review and Comment
- Brochures at Town Hall and Public Meetings
- Storm Drain Marking/Stenciling

Based upon the progress made during the first twelve reporting years and feedback from town employees and the public, it appears that these BMPs are appropriate. The following tables detail the progress made during the reporting period towards achieving the implementation dates and measurable goals for this minimum control measure.

2.1 PUBLIC REVIEW AND COMMENT

Table 2.1 Public Review and Comment BMP Measurable Goals, Implementation Dates & Status				
Target Date	**Status / Completed - Date**		**Measurable Goal / Activity**	**Responsible Dept. or Person**
	YES	**NO (Reason)**		
Year 1 (2004)	YES		Make Draft SWMP & Part B registration available to public 30 days prior to submission. Inform public via local newspaper	SOR/LUA/WM
Year 2 (2005)	NO - Final SWMP, Links and Educational Materials to be posted in Year 3 as a result of update to Town's entire Website.		Post Final SWMP, 2004 Annual Report, links and additional information of Website	SOR/LUA/WM
Year 3 (2006)	YES – Year 3 - Links and Educational Materials need to be added in Years 4 & 5		Make SWMP, Annual Report and materials available to public via town Website.	SOR/LUA/WM
Year 4 (2007)	YES – Year 4 - Links and Educational Materials were added to website		Make SWMP, 2008 Annual Report and materials available to public via town Website. Updated Town website will be posted in January 2008	SOR/LUA/WM
Year 5 (2008)	YES – Year 5 - Links and Educational Materials were added to website		Make SWMP, 2008 Annual Report and updated materials available to public via town Website.	SOR/LUA/WM
Year 6 (2009)	YES – Year 6 - Links and Educational Materials were added to website		Make SWMP, 2009 Annual Report and updated materials available to public via town Website.	SOR/LUA/WM
Year 7 (2010)	YES – Year 7 - Links and Educational Materials were added to website		Make SWMP, 2010 Annual Report and updated materials available to public via town Website.	SOR/LUA/WM
Year 8 (2011)	YES – Year 8 - Links and Educational Materials were added to website		Make SWMP, 2011 Annual Report and updated materials available to public via town Website.	SOR/LUA/WM
Year 9 (2012)	YES – Year 9 - Links to Educational Materials maintained, although Annual Report upload was delayed.		Make SWMP, 2012 Annual Report and updated materials available to public via town Website.	SOR/LUA/WM
Year 10 (2013)	YES – Year 10 - Links to Educational Materials maintained, although Annual Report upload was delayed.		Make SWMP, 2013 Annual Report and updated materials available to public via town Website.	SOR/LUA/WM
Year 11 (2014)	YES – Year 11 - Links to Educational Materials maintained, although Annual Report upload was delayed.		Make SWMP, 2014 Annual Report and updated materials available to public via town Website.	SOR/LUA/WM
Year 12 (2015)	YES – Year 12 - Links to Educational Materials maintained, although Annual Report upload was delayed.		Make SWMP, 2015 Annual Report and updated materials available to public via town Website.	SOR/LUA/WM

Year 13 (2016)	YES – Year 13 - Links to Educational Materials maintained.	Make SWMP, 2016 Annual Report and updated materials available to public via town Website.	SOR/LUA/WM

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

2.2 BROCHURES AT TOWN HALL AND PUBLIC MEETINGS

Table 2.2
Brochures at Town Hall and Public Meetings BMP
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES – Year 1 - CTDEP & EPA Materials Collected		Develop and or collect brochure / fact sheet	SOR/LUA
Year 2 (2005)	YES - Year 2 - Displayed in First Selectmen's Office and Land Use Office, Displayed at 3 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at Town Hall	SOR/LUA
Year 3 (2006)	YES - Year 3 - Displayed in First Selectmen's Office and Land Use Office. Displayed at 3 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 1 meeting each for Conservation Commission, IWWC, and P&Z Commission	SOR/LUA
Year 4 (2007)	YES - Year 4 - Displayed in First Selectmen's Office and Land Use Office. Displayed at 3 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 3 public information meetings and hearings for Conservation Commission, IWWC, and P&Z Commission	SOR/LUA
Year 5 (2008)	YES - Year 5 - Displayed in First Selectmen's Office and Land Use Office. Displayed at 6 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, IWWC, and P&Z Commission	SOR/LUA
Year 6 (2009)	YES - Year 6 - Displayed in First Selectmen's Office and Land Use Office. Displayed at 6 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, IWWC, and P&Z Commission	SOR/LUA
Year 7 (2010)	YES - Year 7 - Displayed in First Selectmen's Office and Land Use Office. Displayed at 6 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, IWWC, and P&Z Commission	SOR/LUA
Year 8 (2011)	YES - Year 8 - Displayed in First Selectmen's Office and Land Use Office. Displayed at 6 Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, IWWC, and P&Z Commission	SOR/LUA
Year 9 (2012)	YES - Year 9 - Displayed in First Selectmen's Office, Land Use Office, and at Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, IWWC, and P&Z Commission	SOR/LUA
Year 10 (2013)	YES - Year 10 - Displayed in First Selectmen's Office, Land Use Office, and at Inland Wetlands Meetings		Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, IWWC, and P&Z Commission	SOR/LUA

Year 11 (2014)	YES - Year 11 - Displayed in First Selectmen's Office, Land Use Office, and at Inland Wetlands Meetings	Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, IWWC, and P&Z Commission	SOR/LUA
Year 12 (2015)	YES - Year 12 - Displayed in First Selectmen's Office, Land Use Office, and at Inland Wetlands Meetings	Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, IWWC, and P&Z Commission	SOR/LUA
Year 13 (2016)	YES - Year 13 - Displayed in First Selectmen's Office, Land Use Office, and at Inland Wetlands Meetings	Display and distribute brochure/fact sheet at 6 public information meetings and hearings for Conservation Commission, IWWC, and P&Z Commission	SOR/LUA

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

2.3 STORM DRAIN MARKING / STENCILING

Table 2.3 Storm Drain Marking / Stenciling BMP Measurable Goals, Implementation Dates & Status				
Target Date	**Status / Completed - Date**		**Measurable Goal / Activity**	**Responsible Dept. or Person**
	YES	**NO (Reason)**		
Year 1 (2004)	YES – Year 1 - Markers collected and locations identified		Collect materials from CTDEP and identify appropriate locations for installation	SOR
Year 2 (2005)	YES – Year 2 - Markers installed on 37 catch basins		Install storm drain markers / stencils	SOR
Year 3 (2006)	YES – Year 3 - Markers installed on 40 catch basins		Install storm drain markers / stencils	SOR
Year 4 (2007)	YES – Year 5 - Markers installed on 32 catch basins		Install storm drain markers / stencils	SOR
Year 5 (2008)	YES – Year 5 - Markers installed on 50 catch basins		Install storm drain markers / stencils	SOR
Year 6 (2009)	YES – Year 6 - Markers installed on 25 catch basins		Install storm drain markers / stencils	SOR
Year 7 (2010)	YES – Year 7 - Markers installed on 20 catch basins		Install storm drain markers / stencils	SOR
Year 8 (2011)	NO – Year 8 - (Town resources focused on road program and storm cleanup. MS4 activities will resume in 2012.)		Install storm drain markers / stencils	SOR
Year 9 (2012)	NO – Year 9 - (Town resources focused on road program. MS4 activities will resume in 2013.)		Install storm drain markers / stencils	SOR
Year 10 (2013)	NO – Year 10 – Lack of Town resources / personnel.		Install storm drain markers / stencils	SOR
Year 11 (2014)	NO – Year 11 – Lack of Town resources / personnel.		Install storm drain markers / stencils	SOR
Year 12 (2015)	YES – Year 12 – Markers installed on 50 catch basins.		Install storm drain markers / stencils	SOR
Year 13 (2016)	YES – Year 13 – Markers installed on 70 catch basins.		Install storm drain markers / stencils	SOR

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

SECTION 3 – ILLICIT DISHCARGE DETECTION AND ELIMINATION (IDDE)

The following BMPs were selected by the town to address the Illicit Discharge and Detection (IDDE) minimum control measure of the General Permit:

- Ordinance Regarding Non-Stormwater Discharges
- Storm Sewer System Map
- Illicit Discharge Detection and Elimination Program
- Future Illicit Discharge Detection and Elimination

Based upon the progress made during the first twelve reporting years and feedback from town employees and the public, it appears that these BMPs are appropriate. The following tables detail the progress made during the reporting period towards achieving the implementation dates and measurable goals for this minimum control measure.

3.1 ORDINANCE REGARDING NON-STORMWATER DISCHARGES

Table 3.1
Town Ordinance Regarding Non-Stormwater Discharges
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1-2 (2004-5)	YES – Year 1 - Ordinances reviewed. To be revised in Year 2.		Review town ordinances; revise as necessary. Provide training regarding illegal discharges and improper disposal of wastes.	SOR/LUA
Year 2 (2005)	YES – Year 2 - Ordinances reviewed and found to be adequate.		Continue training.	SOR
Year 3 (2006)	YES – Year 3		Continue training.	SOR
Year 4 (2007)	YES – Year 4		Continue training.	SOR
Year 5 (2008)	YES – Year 5		Continue training. Tailgate talks.	SOR
Year 6 (2009)	YES – Year 6		Continue training. Tailgate talks.	SOR
Year 7 (2010)	YES – Year 7		Continue training. Tailgate talks.	SOR
Year 8 (2011)	YES – Year 8		Continue training. Tailgate talks.	SOR
Year 9 (2012)	YES – Year 9		Continue training. Tailgate talks.	SOR
Year 10 (2013)	YES – Year 10		Continue training. Tailgate talks.	SOR
Year 11 (2014)	YES – Year 11		Continue training. Tailgate talks.	SOR
Year 12 (2015)	YES – Year 12		Continue training. Tailgate talks.	SOR
Year 13 (2016)	YES – Year 13		Continue training. Tailgate talks.	SOR

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

3.2 STORMSEWER SYSTEM MAP

Table 3.2 Storm Sewer System Map Measurable Goals, Implementation Dates & Status				
Target Date	**Status / Completed - Date**		**Measurable Goal / Activity**	**Responsible Dept. or Person**
	YES	**NO (Reason)**		
Year 1 (2004)	YES – Year 1		Acquire base mapping from Council of Governments – Naugatuck Valley	SOR / WM
Year 2-3 (2005-6)	Year 2 – 50% of field survey complete currently. 100% expected by end of Year 3.		Perform field survey with GPS	SOR / WM
Year 3 (2006)	Year 3 – Map Completed New Outfalls Mapped as Installed		Develop GIS Map and Database	SOR / WM
Year 4 (2007)	YES – Year 4 - Map completed and updated - additional outfalls updated as installed		Maintain and Update GIS Map and Database	SOR / WM
Year 5 (2008)	YES – Year 5 - No new outfalls added or located		Modify and maintain database and map (GIS)	SOR / WM
Year 6 (2009)	YES – Year 6 - No new outfalls added or located		Modify and maintain database and map (GIS)	SOR / WM
Year 7 (2010)	YES – Year 7 - No new outfalls added or located		Modify and maintain database and map (GIS)	SOR / WM
Year 8 (2011)	YES – Year 8 - No new outfalls added or located		Modify and maintain database and map (GIS)	SOR / WM
Year 9 (2012)	YES – Year 9 - No new outfalls added or located		Modify and maintain database and map (GIS)	SOR / WM
Year 10 (2013)	YES – Year 10 - No new outfalls added or located		Modify and maintain database and map (GIS)	SOR / WM
Year 11 (2014)	YES – Year 11 - No new outfalls added or located		Modify and maintain database and map (GIS)	SOR / WM
Year 12 (2015)	YES – Year 12 - No new outfalls added or located		Modify and maintain database and map (GIS)	SOR / WM
Year 13 (2016)	YES – Year 13 - No new outfalls added or located		Modify and maintain database and map (GIS)	SOR / WM

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

3.3 ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Table 3.3
Illicit Discharge Detection and Elimination Program
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES – Year 1		Perform outfall monitoring 2 Residential, 2 Industrial & 2 Commercial Outfalls to be sampled.	SOR
Year 2 (2005)	YES – Year 2		Perform outfall monitoring 2 Residential, 2 Industrial & 2 Commercial Outfalls to be sampled.	SOR
Year 3 (2006)	YES – Year 3		Perform outfall monitoring 2 Residential, 2 Industrial & 2 Commercial Outfalls to be sampled.	SOR
Year 4 (2007)	YES – Year 4		Perform outfall monitoring 2 Residential, 2 Industrial & 2 Commercial Outfalls to be sampled.	SOR
Year 5 (2008)	YES – Year 5		Perform outfall monitoring 1 Residential, 2 Industrial & 1 Commercial Outfalls to be sampled. 2 samples taken from Naugatuck River.	SOR
Year 6 (2009)	YES – Year 6		Perform outfall monitoring 2 Industrial & 2 Commercial Outfalls to be sampled. 2 samples taken from Naugatuck River.	SOR
Year 7 (2010)	YES – Year 7		Perform outfall monitoring 2 Residential, 1 Industrial & 1 Commercial Outfalls were sampled. 2 samples taken from Naugatuck River.	SOR
Year 8 (2011)	YES – Year 8		Perform outfall monitoring 2 Residential, 1 Industrial & 1 Commercial Outfalls were sampled. 2 samples taken from Naugatuck River.	SOR
Year 9 (2012)	YES – Year 9		Perform outfall monitoring 2 Residential, 1 Industrial & 1 Commercial Outfalls were sampled. 2 samples taken from Naugatuck River.	SOR
Year 10 (2013)	YES – Year 10		Perform outfall monitoring 2 Residential, 1 Industrial & 1 Commercial Outfalls were sampled. 2 samples taken from Naugatuck River.	SOR
Year 11 (2014)	YES – Year 11		Perform outfall monitoring 2 Residential, 1 Industrial & 1 Commercial Outfalls were sampled. 2 samples taken from Naugatuck River.	SOR
Year 12 (2015)	YES – Year 12		Perform outfall monitoring 2 Residential, 1 Industrial & 1 Commercial Outfalls were sampled. 2 samples taken from Naugatuck River.	SOR

Year 13 (2016)	YES – Year 13	Perform outfall monitoring 2 Residential, 1 Industrial & 1 Commercial Outfalls were sampled. 2 samples taken from Naugatuck River.	SOR

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

3.4 FUTURE ILLICIT DISCHARGE DETECTION AND ELIMINATION

Table 3.4
Future Illicit Discharge Detection and Elimination
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES – Year 1 - Monitor Storm Water Discharges		Monitored stormwater discharges	SOR
Year 2 (2005)	YES – Year 2 - Monitor Storm Water Discharges		Monitored stormwater discharges	SOR
Year 3 (2006)	YES – Year 3 - Monitor Storm Water Discharges		Monitored stormwater discharges	SOR
Year 4 (2007)	YES – Year 4 - Monitor Storm Water Discharges		Monitored stormwater discharges	SOR
Year 5 (2008)	YES – Year 5 - Rehabilitated Pipes checked for Illicit Discharges		Monitored stormwater discharges	SOR
Year 6 (2009)	YES – Year 6 - Monitor Storm Water Discharges		Continue to monitor stormwater discharges	SOR
Year 7 (2010)	YES – Year 7 - Monitor Storm Water Discharges		Continue to monitor stormwater discharges	SOR
Year 8 (2011)	YES – Year 8 - Monitor Storm Water Discharges		Continue to monitor stormwater discharges	SOR
Year 9 (2012)	YES – Year 9 - Monitor Storm Water Discharges		Continue to monitor stormwater discharges	SOR
Year 10 (2013)	YES – Year 10 - Monitor Storm Water Discharges		Continue to monitor stormwater discharges	SOR
Year 11 (2014)	YES – Year 11 - Monitor Storm Water Discharges		Continue to monitor stormwater discharges	SOR
Year 12 (2015)	YES – Year 12 - Monitor Storm Water Discharges		Continue to monitor stormwater discharges	SOR
Year 13 (2016)	YES – Year 13 - Monitor Storm Water Discharges		Continue to monitor stormwater discharges	SOR

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

SECTION 4 – CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

The following BMPs were selected by the town to address the Construction Site Stormwater Runoff Control minimum control measure of the General Permit:

- Ordinance Requiring Erosion and Sediment Controls
- Procedures for Notifying Construction Site Developers and Operators of Requirements for Registration
- Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control Best Management Practices
- Requirements for Construction Site Operators to Control Waste at the Site
- Procedures for Site Plan Review
- Procedures for Receipt and Consideration of Information Submitted by the Public
- Procedures for Site Inspection and Enforcement of Control Measures

Based upon the progress made during the first twelve reporting years and feedback from town employees and the public, it appears that these BMPs are appropriate. The following tables detail the progress made during the reporting period towards achieving the implementation dates and measurable goals for this minimum control measure.

4.1 ORDINANCE REQUIRING EROSION AND SEDIMENT CONTROLS

Table 4.1
Ordinance Requiring Erosion and Sediment Controls
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1-2 (2004-5)	YES – Regulations reviewed.		Review and revise current town regulations to include reference to specific documents for design of Erosion and Sediment Control BMPs	SOR / LUA
Year 2 (2005)	YES (Partial) – Review of regulations completed. Revisions are required. To be completed in Year 3.		Continue Requirements and Guidelines for Erosion and Sediment Controls on all Projects	SOR / LUA
Year 3 (2006)	YES – Revisions made		Continue Requirements and Guidelines for Erosion and Sediment Controls on all Projects	SOR / LUA
Year 4 (2007)	YES		Continue Requirements and Guidelines for Erosion and Sediment Controls on all Projects	SOR / LUA
Year 5 (2008)	YES		Continue Requirements and Guidelines for Erosion and Sediment Controls on all Projects	SOR / LUA
Year 6 (2009)	YES		Continue Requirements and Guidelines for Erosion and Sediment Controls on all Projects	SOR / LUA
Year 7 (2010)	YES		Continue Requirements and Guidelines for Erosion and Sediment Controls on all Projects	SOR / LUA
Year 8 (2011)	YES		Continue Requirements and Guidelines for Erosion and Sediment Controls on all Projects	SOR / LUA
Year 9 (2012)	YES		Continue Requirements and Guidelines for Erosion and Sediment Controls on all Projects	SOR / LUA
Year 10 (2013)	YES		Continue Requirements and Guidelines for Erosion and Sediment Controls on all Projects	SOR / LUA
Year 11 (2014)	YES		Continue Requirements and Guidelines for Erosion and Sediment Controls on all Projects	SOR / LUA
Year 12 (2015)	YES		Continue Requirements and Guidelines for Erosion and Sediment Controls on all Projects	SOR / LUA
Year 13 (2016)	YES		Continue Requirements and Guidelines for Erosion and Sediment Controls on all Projects	SOR / LUA

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

4.2 PROCEDURE FOR NOTIFYING CONSTRUCTION SITE DEVELOPER AND OPERATORS OF REQUIREMENTS FOR REGISTRATION

Table 4.2
Procedures for Notifying Construction Site Developers and Operators of Requirements for Registration
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES – Regulations reviewed.		Review and revise current town regulations to include procedures for notifying construction site developers and operators of the requirements for registration under the General Permit	LUA
Year 2 (2005)	YES (Partial) – Review of regulations completed. Revisions are required. To be completed in Year 3.		Continue Compliance with Registration Requirements	LUA
Year 3 (2006)	YES		Continue Compliance with Registration Requirements	LUA
Year 4 (2007)	YES		Continue Compliance with Registration Requirements	LUA
Year 5 (2008)	YES		Continue Compliance with Registration Requirements	LUA
Year 6 (2009)	YES		Continue Compliance with Registration Requirements	LUA
Year 7 (2010)	YES		Continue Compliance with Registration Requirements	LUA
Year 8 (2011)	YES		Continue Compliance with Registration Requirements	LUA
Year 9 (2012)	YES		Continue Compliance with Registration Requirements	LUA
Year 10 (2013)	YES		Continue Compliance with Registration Requirements	LUA
Year 11 (2014)	YES		Continue Compliance with Registration Requirements	LUA
Year 12 (2015)	YES		Continue Compliance with Registration Requirements	LUA
Year 13 (2016)	YES		Continue Compliance with Registration Requirements	LUA

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

4.3 REQUIREMENTS FOR CONSTRUCTION SITE OPERATORS TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES

Table 4.3
Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control BMPs in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES – Regulations reviewed.		Review and revise current town regulations to be in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control	LUA
Year 2 (2005)	YES (Partial) – Review of regulations completed. Revisions are required. To be completed in Year 3.		Continue Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control BMPs	LUA
Year 3 (2006)	YES		Continue Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control BMPs	LUA
Year 4 (2007)	YES		Continue Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control BMPs	LUA
Year 5 (2008)	YES		Continue Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control BMPs	LUA
Year 6 (2009)	YES		Continue Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control BMPs	LUA
Year 7 (2010)	YES		Continue Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control BMPs	LUA
Year 8 (2011)	YES		Continue Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control BMPs	LUA
Year 9 (2012)	YES		Continue Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control BMPs	LUA
Year 10 (2013)	YES		Continue Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control BMPs	LUA

Year 11 (2014)	YES	Continue Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control BMPs	LUA
Year 12 (2015)	YES	Continue Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control BMPs	LUA
Year 13 (2016)	YES	Continue Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control BMPs	LUA

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

4.4 REQUIREMENTS FOR CONSTRUCTION SITE OPERATORS TO CONTROL WASTE AT THE SITE

Table 4.4
Requirements for Construction Site Operators to Control Waste at the Site
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES – Regulations reviewed.		Review and revise current town regulations to include Requirements for Construction Site Operators to Control Waste at the Site	SOR / LUA
Year 2 (2005)	YES (Partial) – Review of regulations completed. Revisions are required. To be completed in Year 3.		Continue Requirements for Construction Site Operators to Control Waste at the Site	SOR / LUA
Year 3 (2006)	YES		Continue Requirements for Construction Site Operators to Control Waste at the Site	SOR / LUA
Year 4 (2007)	YES		Continue Requirements for Construction Site Operators to Control Waste at the Site	SOR / LUA
Year 5 (2008)	YES		Continue Requirements for Construction Site Operators to Control Waste at the Site	SOR / LUA
Year 6 (2009)	YES		Continue Requirements for Construction Site Operators to Control Waste at the Site	SOR / LUA
Year 7 (2010)	YES		Continue Requirements for Construction Site Operators to Control Waste at the Site	SOR / LUA
Year 8 (2011)	YES		Continue Requirements for Construction Site Operators to Control Waste at the Site	SOR / LUA
Year 9 (2012)	YES		Continue Requirements for Construction Site Operators to Control Waste at the Site	SOR / LUA
Year 10 (2013)	YES		Continue Requirements for Construction Site Operators to Control Waste at the Site	SOR / LUA
Year 11 (2014)	YES		Continue Requirements for Construction Site Operators to Control Waste at the Site	SOR / LUA
Year 12 (2015)	YES		Continue Requirements for Construction Site Operators to Control Waste at the Site	SOR / LUA
Year 13 (2016)	YES		Continue Requirements for Construction Site Operators to Control Waste at the Site	SOR / LUA

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

4.5 PROCEDURES FOR SITE PLAN REVIEW

Table 4.5 Procedures for Site Plan Review Measurable Goals, Implementation Dates & Status				
Target Date	**Status / Completed - Date**		**Measurable Goal / Activity**	**Responsible Dept. or Person**
	YES	**NO (Reason)**		
Year 1 (2004)	YES		Continue Site Plan Review Procedures	LUA
Year 2 (2005)	YES		Continue Site Plan Review Procedures	LUA
Year 3 (2006)	YES		Continue Site Plan Review Procedures	LUA
Year 4 (2007)	YES		Continue Site Plan Review Procedures	LUA
Year 5 (2008)	YES		Continue Site Plan Review Procedures	LUA
Year 6 (2009)	YES		Continue Site Plan Review Procedures	LUA
Year 7 (2010)	YES		Continue Site Plan Review Procedures	LUA
Year 8 (2011)	YES		Continue Site Plan Review Procedures	LUA
Year 9 (2012)	YES		Continue Site Plan Review Procedures	LUA
Year 10 (2013)	YES		Continue Site Plan Review Procedures	LUA
Year 11 (2014)	YES		Continue Site Plan Review Procedures	LUA
Year 12 (2015)	YES		Continue Site Plan Review Procedures	LUA
Year 13 (2016)	YES		Continue Site Plan Review Procedures	LUA

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

4.6 PROCEDURES FOR RECEIPT AND CONSIDERATION OF INFORMATION SUBMITTED BY THE PUBLIC

Table 4.6
Procedures for Receipt and Consideration of Information Submitted by the Public
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES		Continue Procedures for Receipt and Consideration of Information Submitted by the Public	OFS / LUA
Year 2 (2005)	YES		Continue Procedures for Receipt and Consideration of Information Submitted by the Public	OFS / LUA
Year 3 (2006)	YES		Continue Procedures for Receipt and Consideration of Information Submitted by the Public	OFS / LUA
Year 4 (2007)	YES		Continue Procedures for Receipt and Consideration of Information Submitted by the Public	OFS / LUA
Year 5 (2008)	YES		Continue Procedures for Receipt and Consideration of Information Submitted by the Public	OFS / LUA
Year 6 (2009)	YES		Continue Procedures for Receipt and Consideration of Information Submitted by the Public	OFS / LUA
Year 7 (2010)	YES		Continue Procedures for Receipt and Consideration of Information Submitted by the Public	OFS / LUA
Year 8 (2011)	YES		Continue Procedures for Receipt and Consideration of Information Submitted by the Public	OFS / LUA
Year 9 (2012)	YES		Continue Procedures for Receipt and Consideration of Information Submitted by the Public	OFS / LUA
Year 10 (2013)	YES		Continue Procedures for Receipt and Consideration of Information Submitted by the Public	OFS / LUA
Year 11 (2014)	YES		Continue Procedures for Receipt and Consideration of Information Submitted by the Public	OFS / LUA
Year 12 (2015)	YES		Continue Procedures for Receipt and Consideration of Information Submitted by the Public	OFS / LUA
Year 13 (2016)	YES		Continue Procedures for Receipt and Consideration of Information Submitted by the Public	OFS / LUA

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster; OFS=Office of First Selectman

4.7 PROCEDURES FOR SITE INSPECTION AND ENFORCEMENT OF CONTROL MEASURES

Table 4.7
Procedures for Site Inspection and Enforcement of Control Measures
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES		Continue Site Inspection and Enforcement of Control Measures	SOR / LUA
Year 2 (2005)	YES		Continue Site Inspection and Enforcement of Control Measures	SOR / LUA
Year 3 (2006)	YES		Continue Site Inspection and Enforcement of Control Measures	SOR / LUA
Year 4 (2007)	YES		Continue Site Inspection and Enforcement of Control Measures	SOR / LUA
Year 5 (2008)	YES		Continue Site Inspection and Enforcement of Control Measures	SOR / LUA
Year 6 (2009)	YES		Continue Site Inspection and Enforcement of Control Measures	SOR / LUA
Year 7 (2010)	YES		Continue Site Inspection and Enforcement of Control Measures	SOR / LUA
Year 8 (2011)	YES		Continue Site Inspection and Enforcement of Control Measures	SOR / LUA
Year 9 (2012)	YES		Continue Site Inspection and Enforcement of Control Measures	SOR / LUA
Year 10 (2013)	YES		Continue Site Inspection and Enforcement of Control Measures	SOR / LUA
Year 11 (2014)	YES		Continue Site Inspection and Enforcement of Control Measures	SOR / LUA
Year 12 (2015)	YES		Continue Site Inspection and Enforcement of Control Measures	SOR / LUA
Year 13 (2016)	YES		Continue Site Inspection and Enforcement of Control Measures	SOR / LUA

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

SECTION 5 – POST CONSTRUCTION STORMWATER MANAGEMENT

The following BMPs were selected by the town to address the Post Construction Stormwater Management minimum control measure of the General Permit:

- Requirements for Structural and Non-Structural BMPs
- Procedures for Addressing Post Construction Runoff from Construction and Reconstruction Projects
- Ensuring Long Term Operation and Maintenance of Best Management Practices

Based upon the progress made during the first twelve reporting years and feedback from town employees and the public, it appears that these BMPs are appropriate. The following tables detail the progress made during the reporting period towards achieving the implementation dates and measurable goals for this minimum control measure.

5.1 REQUIREMENTS FOR STRUCTURAL AND NON-STRUCTURAL BEST MANAGEMENT PRACTICES

Table 5.1
Requirements for Structural and Non-Structural BMPs
Measurable Goals and Implementation Dates

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES – Regulations reviewed.		Review and modify current town regulations to be in accordance with guidelines and procedures for Structural and Non Structural BMPs listed in the SWMP.	Superintendent of Roads
Year 2 (2005)	YES (Partial) Review of regulations completed. Revisions are required. To be completed in Year 3.		Implementation of BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 3 (2006)	YES		Implementation of BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 4 (2007)	YES		Continue implementation of BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 5 (2008)	YES		Continue implementation of BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 6 (2009)	YES		Continue implementation of BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 7 (2010)	YES		Continue implementation of BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 8 (2011)	YES		Continue implementation of BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 9 (2012)	YES		Continue implementation of BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 10 (2013)	YES		Continue implementation of BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 11 (2014)	YES		Continue implementation of BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 12 (2015)	YES		Continue implementation of BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 13 (2016)	YES		Continue implementation of BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

5.2 PROCEDURES FOR ADDRESSING POST-CONSTRUCTION BEST MANAGEMENT PRACTICES

Table 5.2
Procedures for Addressing Post Construction BMPs
Measurable Goals and Implementation Dates

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES		Continue procedures for addressing post construction BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 2 (2005)	YES		Continue procedures for addressing post construction BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 3 (2006)	YES		Continue procedures for addressing post construction BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 4 (2007)	YES		Continue procedures for addressing post construction BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 5 (2008)	YES		Continue procedures for addressing post construction BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 6 (2009)	YES		Continue procedures for addressing post construction BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 7 (2010)	YES		Continue procedures for addressing post construction BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 8 (2011)	YES		Continue procedures for addressing post construction BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 9 (2012)	YES		Continue procedures for addressing post construction BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 10 (2013)	YES		Continue procedures for addressing post construction BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 11 (2014)	YES		Continue procedures for addressing post construction BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA

Year 12 (2015)	YES	Continue procedures for addressing post construction BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA
Year 13 (2016)	YES	Continue procedures for addressing post construction BMPs including projects with greater than or equal to 1 acre in disturbance area	SOR / LUA

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

5.3 ENSURING LONG-TERM OPERATION AND MAINTENANCE OF BEST MANAGEMENT PRACTICES

Table 5.3
Ensuring Long-Term Operation and Maintenance of BMPs
Measurable Goals and Implementation Dates

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES		Continue operation and maintenance of BMPs	SOR / LUA
Year 2 (2005)	YES		Continue operation and maintenance of BMPs	SOR / LUA
Year 3 (2006)	YES		Continue operation and maintenance of BMPs	SOR / LUA
Year 4 (2007)	YES		Continue operation and maintenance of BMPs	SOR / LUA
Year 5 (2008)	YES		Continue operation and maintenance of BMPs	SOR / LUA
Year 6 (2009)	YES		Continue operation and maintenance of BMPs	SOR / LUA
Year 7 (2010)	YES		Continue operation and maintenance of BMPs	SOR / LUA
Year 8 (2011)	YES		Continue operation and maintenance of BMPs	SOR / LUA
Year 9 (2012)	YES		Continue operation and maintenance of BMPs	SOR / LUA
Year 10 (2013)	YES		Continue operation and maintenance of BMPs	SOR / LUA
Year 11 (2014)	YES		Continue operation and maintenance of BMPs	SOR / LUA
Year 12 (2015)	YES		Continue operation and maintenance of BMPs	SOR / LUA
Year 13 (2016)	YES		Continue operation and maintenance of BMPs	SOR / LUA

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

SECTION 6 – POLLUTION PREVENTION / GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

The following BMPs were selected by the town to address the Pollution Prevention / Good Housekeeping for Municipal Operations minimum control measure of the General Permit:

- Operation and Maintenance Program
- Employee Training Program
- Street Sweeping Program
- Catch Basin Maintenance Program
- Preventative Maintenance Program

Based upon the progress made during the first twelve reporting years and feedback from town employees and the public, it appears that these BMPs are appropriate. The following tables detail the progress made during the reporting period towards achieving the implantation dates and measurable goals for this minimum control measure.

6.1 OPERATION AND MAINTENANCE PROGRAM

Table 6.1
Operation and Maintenance Program BMP
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES – O & M procedures reviewed. Revised procedures to meet the requirements of the G.P.		Review current Operation and Maintenance procedures and revise to meet the requirements of the General Permit.	SOR
Year 2 (2005)	YES		Implement Operation and Maintenance requirements. Switched to soy-based degreaser versus diesel fuel.	SOR
Year 3 (2006)	YES		Continue Operation and Maintenance requirements. Alternative sand/salt applications to reduce sediment put down.	SOR
Year 4 (2007)	YES		Continue Operation and Maintenance requirements. Switched to all salt-based product.	SOR
Year 5 (2008)	YES		Continue Operation and Maintenance requirements.	SOR
Year 6 (2009)	YES		Continue Operation and Maintenance requirements.	SOR
Year 7 (2010)	YES		Continue Operation and Maintenance requirements.	SOR
Year 8 (2011)	YES		Continue Operation and Maintenance requirements.	SOR
Year 9 (2012)	YES		Continue Operation and Maintenance requirements.	SOR
Year 10 (2013)	YES		Continue Operation and Maintenance requirements.	SOR
Year 11 (2014)	YES		Continue Operation and Maintenance requirements.	SOR
Year 12 (2015)	YES		Continue Operation and Maintenance requirements.	SOR
Year 13 (2016)	YES		Continue Operation and Maintenance requirements.	SOR

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

In year 4, the highway department switched to an all salt-based product to minimize the amount of sediment displaced. The Town has noticed a significant reduction in the amount of sediment found on local roads since the switch to an all salt-based product.

6.2 EMPLOYEE TRAINING PROGRAM

Table 6.2
Employee Training Program
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES – Tailgate Meetings revised to include G.P. requirement discussion		Modify Existing Employee Training "Tailgate Meetings" to incorporate the requirements of the General Permit	SOR
Year 2 (2005)	YES – Tailgate Meetings held on a regular basis.		Implement Employee Training requirements	SOR
Year 3 (2006)	YES – Tailgate Meetings held on a regular basis.		Continue Employee Training requirements	SOR
Year 4 (2007)	YES – Tailgate Meetings held on a regular basis.		Continue Employee Training requirements	SOR
Year 5 (2008)	YES – Tailgate Meetings held on a regular basis		Continue Employee Training requirements	SOR
Year 6 (2009)	YES – Tailgate Meetings held on a regular basis		Continue Employee Training requirements	SOR
Year 7 (2010)	YES – Tailgate Meetings held as time allows		Continue Employee Training requirements	SOR
Year 8 (2011)	YES – Tailgate Meetings held as time allows		Continue Employee Training requirements	SOR
Year 9 (2012)	YES – Tailgate Meetings held as time allows		Continue Employee Training requirements	SOR
Year 10 (2013)	YES – Tailgate Meetings held as time allows		Continue Employee Training requirements	SOR
Year 11 (2014)	YES – Tailgate Meetings held as time allows		Continue Employee Training requirements	SOR
Year 12 (2015)	YES – Tailgate Meetings held as time allows		Continue Employee Training requirements	SOR
Year 13 (2016)	YES – Tailgate Meetings held as time allows		Continue Employee Training requirements	SOR

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

6.3 STREET SWEEPING PROGRAM

Table 6.3
Street Sweeping Program BMP
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES		Implemented Street Sweeping requirements - Priority Streets swept multiple times as per SWMP. 1,124.4 tons of material collected in Year 1.	SOR
Year 2 (2005)	YES		Street sweeping program continued – Priority Streets swept multiple times as per SWMP. 666.9 tons of material collected in Year 2.	SOR
Year 3 (2006)	YES		Street sweeping program continued – Priority Streets swept multiple times as per SWMP. 575 tons of material collected in Year 3.	SOR
Year 4 (2007)	YES		Street sweeping program continued – Minimal material collected as a result of change in sand/salt mixture to all salt.	SOR
Year 5 (2008)	YES		Street sweeping program continued – Sweep each street a minimum of 1 time.	SOR
Year 6 (2009)	YES		Continue Street Sweeping requirements – Sweep each street a minimum of 1 time. Jackson Street, River Street and Prospect Street swept twice.	SOR
Year 7 (2010)	YES		Continue Street Sweeping requirements – Sweep each street a minimum of 1 time.	SOR
Year 8 (2011)	YES		Continue Street Sweeping requirements – Sweep each street a minimum of 1 time.	SOR
Year 9 (2012)	YES		Continue Street Sweeping requirements – Sweep each street a minimum of 1 time.	SOR
Year 10 (2013)	YES		Continue Street Sweeping requirements – Sweep each street a minimum of 1 time.	SOR
Year 11 (2014)	YES		Continue Street Sweeping requirements – Sweep each street a minimum of 1 time.	SOR
Year 12 (2015)	YES		Continue Street Sweeping requirements – Sweep each street a minimum of 1 time.	SOR
Year 13 (2016)	YES		Continue Street Sweeping requirements – Sweep each street a minimum of 1 time.	SOR

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

In years 4, 5 6, 7, 8, and 9 as a result of an all salt-based product, there was no longer the need to perform multiple sweepings of priority areas. The amount of material on the roads has been so minimal that the volume of material collected has not been tracked. All roads within the town will continue to be swept a minimum of 1 time per year.

6.4 CATCH BASIN MAINTENANCE PROGRAM

Table 6.4
Catch Basin Maintenance Program BMP
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	NO – Limited catch basin clean out.		Implemented Catch Basin Maintenance requirements	SOR
Year 2 (2005)	YES – New Vac. Truck obtained in October 2005. 37 Catch Basins cleaned.		Continued Catch Basin Maintenance requirements	SOR
Year 3 (2006)	YES – 470 Catch Basins cleaned.		Continued Catch Basin Maintenance requirements	SOR
Year 4 (2007)	YES – 40 Catch Basins Cleaned		Continued Catch Basin Maintenance requirements – Less catch basins cleaned as a result of switch to an all salt-based product	SOR
Year 5 (2008)	YES – 50 Catch Basins Cleaned		Continue Catch Basin Maintenance requirements	SOR
Year 6 (2009)	YES – 50 Catch Basins Cleaned		Continue Catch Basin Maintenance requirements	SOR
Year 7 (2010)	YES – 25 Catch Basins Cleaned		Continue Catch Basin Maintenance requirements	SOR
Year 8 (2011)	NO – (Town resources focused on road program and storm cleanup. MS4 activities will resume in 2012.)		Continue Catch Basin Maintenance requirements	SOR
Year 9 (2012)	YES – 100 Catch Basins Cleaned		Continue Catch Basin Maintenance requirements	SOR
Year 10 (2013)	YES – 100 Catch Basins Cleaned		Continue Catch Basin Maintenance requirements	SOR
Year 11 (2014)	YES – 100 Catch Basins Cleaned		Continue Catch Basin Maintenance requirements	SOR
Year 12 (2015)	YES – 100 Catch Basins Cleaned		Continue Catch Basin Maintenance requirements	SOR
Year 13 (2016)	YES – 100 Catch Basins Cleaned		Continue Catch Basin Maintenance requirements	SOR

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

In years 4, 5 6, 7, 8, and 9 as a result of an all salt-based product, the amount of sediment in catch basins has been significantly reduced. This has also resulted in a reduced number of catch basins that need to be cleaned out, similarly to street sweeping.

6.5 PREVENTATIVE MAINTENANCE PROGRAM

Table 6.5
Preventative Maintenance Program
Measurable Goals, Implementation Dates & Status

Target Date	Status / Completed - Date		Measurable Goal / Activity	Responsible Dept. or Person
	YES	NO (Reason)		
Year 1 (2004)	YES		Implemented Preventative Maintenance requirements	SOR
Year 2 (2005)	YES		Continued Preventative Maintenance requirements	SOR
Year 3 (2006)	YES		Continued Preventative Maintenance requirements	SOR
Year 4 (2007)	YES		Continued Preventative Maintenance requirements	SOR
Year 5 (2008)	YES		Continue Preventative Maintenance requirements	SOR
Year 6 (2009)	YES		Continue Preventative Maintenance requirements	SOR
Year 7 (2010)	YES		Continue Preventative Maintenance requirements	SOR
Year 8 (2011)	YES		Continue Preventative Maintenance requirements	SOR
Year 9 (2012)	YES		Continue Preventative Maintenance requirements	SOR
Year 10 (2013)	YES		Continue Preventative Maintenance requirements	SOR
Year 11 (2014)	YES		Continue Preventative Maintenance requirements	SOR
Year 12 (2015)	YES		Continue Preventative Maintenance requirements	SOR
Year 13 (2016)	YES		Continue Preventative Maintenance requirements	SOR

[1]Responsible Parties: SOR=Superintendent of Roads; LUA=Land Use Administrator; WM=Webmaster

SECTION 7 – SUMMARY OF STORMWATER ACTIVITIES

The original General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems was issued on January 9, 2004 with a 5-year term. CTDEP has extended the Permit terms with no modifications. As a result of the extension, the following is a summary of BMPs and stormwater activities that are anticipated for completion during Year 13 of the General Permit for each of the minimum control measures. These control measures will continue to include TMDL program requirements.

7.1 PUBLIC EDUCATION AND OUTREACH

It is anticipated the following activities will be completed:

- Town web site will continue to be updated with additional information.
- Educational materials will continue to be made available in the First Selectmen's Office and Land Use Office.
- A public hearing will be scheduled at which the Town will review pending updates to the stormwater management planning process and the impending 2017 Stormwater Management Plan draft.
- Tributary signage to be inspected at all locations.

7.2 PUBLIC INVOLVEMENT / PARTICIPATION

It is anticipated the following activities will be completed:

- Annual Report and educational materials have been made available to the public via the town website which will be maintained and updated with new materials.
- Additional Storm Drain Markers will be installed and existing stencils will be maintained/repaired as required.

7.3 ILLICIT DISCHARGE DETECTION AND ELIMINATION

It is anticipated the following activities will be completed:

- Continue training regarding illegal discharges and improper disposal of wastes.
- Maintain/Modify storm sewer outfall GIS Map and Database
- Continue monitoring stormwater discharges

7.4 CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

It is anticipated the following activities will be completed:

- Continue Requirements and Guidelines for Erosion and Sediment Controls on all Projects
- Continue Compliance with Registration Requirements
- Continue Requirements for Construction Site Operators to Implement Appropriate Erosion and Sediment Control Best Management Practices
- Continue Requirements for Construction Site Operators to Control Waste at the Site
- Continue site plan review procedures.
- Continue procedures for receipt of information submitted by the public.
- Continue site inspection and enforcement of control measures.

7.5 POST CONSTRUCTION STORMWATER MANAGEMENT

It is anticipated the following activities will be completed:

- Implementation of BMPs including projects with greater than or equal to 1 acre in disturbance area.
- Town staff will review applicability of existing and consideration of updates for ordinance(s) related to the Town's stormwater runoff plan.
- Continue procedures for addressing Post Construction BMPs.
- Continue operation and maintenance of Post Construction BMPs.

7.6 POLLUTION PREVENTION / GOOD HOUSEKEEPING

It is anticipated the following activities will be completed:

- Continue O & M requirements as per General Permit.
- Continue Employee Training. Tailgate Meetings to be held with a section on General Permit Requirements and Stormwater Pollution Prevention.
- Continue Street-Sweeping Requirements. Sweep all areas 1-time per year.

- Continue to Utilize vacuum truck to perform catch basin clean out. Clean priority areas multiple times.

- Continue preventative maintenance and inspection of existing outfalls. Plan and implement maintenance activities to improve any deficient outfall infrastructure.

SECTION 8 - CERTIFICATION AND SIGNATURE

8.1 CERTIFICATION REQUIREMENTS

This plan and any document, including but not limited to any notice, information or report, which is submitted to the commissioner of the CTDEP under the general permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems shall be signed by the chief elected official or principal executive officer, and by the individual or individuals responsible for preparing such document as defined in Section 22a-430-3(b) (2) of the Regulations of Connecticut State Agencies.

8.2 PLAN CERTIFICATION AND SIGNATURE

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

Preparer's Signature
Edmond V. Mone
First Selectman
Town of Thomaston, Connecticut

3/31/17
Signature and Date

Preparer's Signature
Glen Clark
Superintendent of Roads
Town of Thomaston, Connecticut

3/31/2017
Signature and Date

Preparer's Signature
Christopher Wester, P.E.
Vice President
Weston & Sampson Engineers, Inc.

3/31/17
Signature and Date

Preparer's Signature
Jeffrey Willson, LEP
Project Manager
Weston & Sampson Engineers, Inc.

3/31/17
Signature and Date

APPENDIX A:

YEAR 13 MONITORING DATA

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

Stormwater Monitoring Report Form

Please send completed form to: STORMWATER GROUP
BUREAU OF MATERIALS MANAGEMENT & COMPLIANCE ASSURANCE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

PERMITTEE INFORMATION

Town: Thomaston, Connecticut

Mailing Address: 158 Main Street

Contact Person: Glenn Clark Title: Hwy. Superint.

Phone: 860-283-4030 Permit Registration #GSM: 000039

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): Sample ID: C-1-16 (Catch Basin In Front Of Center School) Northing-306226, Easting-511206 (CT Grid System - Feet)

Please check the appropriate area description: ☐ Industrial ☒ Commercial ☐ Residential

Receiving Water (name, basin): Naugatuck River (6900)

Time of Start of Discharge: Continuous Flow

Date/Time Collected: 11/15/2016 12:40 PM Water Temperature: 15.0C

Person Collecting Sample: William Sirotnak (Weston & Sampson)

Storm Magnitude (inches): .66" (wunderground.com) Storm Duration (hours): 8.0 hrs

Date of Previous Storm Event: 10/30/2016

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	SM 4500H+B	6.67(pH units)	Phoenix Environmental Lab
Rain pH	YSI pH Meter	6.30(pH units)	By Sample Collector
Hardness	EPA 130.2	16.2(mg/l)	Phoenix Environmental Lab
Conductivity	SM2510B	18.0(umhos/cm)	Phoenix Environmental Lab
Oil & Grease	EPA 1664 Rev.A	9.6(mg/l)	Phoenix Environmental Lab
COD	EPA 410.1	283.0(mg/l)	Phoenix Environmental Lab
Turbidity	EPA 180.1	37.1(NTU)	Phoenix Environmental Lab
TSS	SM2540D	750.0(mg/l)	Phoenix Environmental Lab
TP	EPA 365.3	1.08(mg/l)	Phoenix Environmental Lab
Ammonia	EPA 350.1	0.24(mg/l)	Phoenix Environmental Lab
TKN	EPA 351.1	2.74(mg/l)	Phoenix Environmental Lab
NO_3+NO_2	SM 4500-NO3F	0.06(mg/l)	Phoenix Environmental Lab
E. coli	SM9222B/G	<10(MPN/100mls)	Phoenix Environmental Lab

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the MS4 General Permit. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: _____
(Print Name)

Signature: _____ Date: _____

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

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BUREAU OF MATERIALS MANAGEMENT & COMPLIANCE ASSURANCE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

PERMITTEE INFORMATION

Town: **Thomaston, Connecticut**

Mailing Address: **158 Main Street**

Contact Person: **Glenn Clark** Title: **Hwy. Superint.**

Phone: **860-283-4030** Permit Registration #GSM: **000039**

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): **Sample ID: I-1-16 (Maple Street at River Street) Northing-304629, Easting-511122 (CT Grid System - Feet)**

Please check the appropriate area description: ☒ Industrial ☐ Commercial ☐ Residential

Receiving Water (name, basin): **Naugatuck River (6900)**

Time of Start of Discharge: **Approx. 12:00 AM**

Date/Time Collected: **11/15/2016 12:30 PM** Water Temperature: **15.0 C**

Person Collecting Sample: **William Sirotnak (Weston & Sampson)**

Storm Magnitude (inches): **.66" (wunderground.com)** Storm Duration (hours): **8.0 hrs**

Date of Previous Storm Event: **10/30/2016**

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	SM 4500H+B	6.44(pH units)	Phoenix Environmental Lab
Rain pH	YSI pH Meter	6.30 (pH units)	By Sample Collector
Hardness	EPA 130.2	2.1(mg/l)	Phoenix Environmental Lab
Conductivity	SM2510B	11.0(umhos/cm)	Phoenix Environmental Lab
Oil & Grease	EPA 1664 Rev.A	<1.4(mg/l)	Phoenix Environmental Lab
COD	EPA 410.1	14.0(mg/l)	Phoenix Environmental Lab
Turbidity	EPA 180.1	8.82(NTU)	Phoenix Environmental Lab
TSS	SM2540D	6.0(mg/l)	Phoenix Environmental Lab
TP	EPA 365.3	0.081(mg/l)	Phoenix Environmental Lab
Ammonia	EPA 350.1	<0.05(mg/l)	Phoenix Environmental Lab
TKN	EPA 351.1	0.23(mg/l)	Phoenix Environmental Lab
NO_3+NO_2	SM 4500-NO3F	0.06(mg/l)	Phoenix Environmental Lab
E. coli	SM9222B/G	41.0(MPN/100 mls)	Phoenix Environmental Lab

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the MS4 General Permit. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: _____
(Print Name)

Signature: _____ Date: _____

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79 ELM STREET
HARTFORD, CT 06106-5127

PERMITTEE INFORMATION

Town: **Thomaston, Connecticut**

Mailing Address: **158 Main Street**

Contact Person: **Glenn Clark** Title: **Hwy. Superint.**

Phone: **860-283-4030** Permit Registration #GSM: **000039**

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): **Sample ID: R-1-16 (CEDAR MOUNTAIN ROAD AT WEST HILL ROAD INTERSECTION) Northing-297140, Easting-512615 (CT Grid System - Feet)**

Please check the appropriate area description: ☐ Industrial ☐ Commercial ☒ Residential

Receiving Water (name, basin): **Naugatuck River (6900)**

Time of Start of Discharge: **11:40 AM**

Date/Time Collected: **11/15/2016 12:00 AM** Water Temperature: **15.00 C**

Person Collecting Sample: **William Sirotnak (Weston & Sampson)**

Storm Magnitude (inches): **.66" (wunderground.com)** Storm Duration (hours): **8.0 hrs**

Date of Previous Storm Event: **10/30/2016**

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	SM 4500H+B	6.94(pH units)	Phoenix Environmental Lab
Rain pH	YSI pH Meter	6.30(pH units)	By Sample Collector
Hardness	EPA 130.2	16.3(mg/l)	Phoenix Environmental Lab
Conductivity	SM2510B	29.0(umhos/cm)	Phoenix Environmental Lab
Oil & Grease	EPA 1664 Rev.A	7.8(mg/l)	Phoenix Environmental Lab
COD	EPA 410.1	247(mg/l)	Phoenix Environmental Lab
Turbidity	EPA 180.1	1.79(NTU)	Phoenix Environmental Lab
TSS	SM2540D	240(mg/l)	Phoenix Environmental Lab
TP	EPA 365.3	0.901(mg/l)	Phoenix Environmental Lab
Ammonia	EPA 350.1	0.25(mg/l)	Phoenix Environmental Lab
TKN	EPA 351.1	2.76(mg/l)	Phoenix Environmental Lab
NO_3+NO_2	SM 4500-NO3F	0.22(mg/l)	Phoenix Environmental Lab
E. coli	SM9222B/G	6490(MPN/100 mls)	Phoenix Environmental Lab

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the MS4 General Permit. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: _____
(Print Name)

Signature: _____ Date: _____

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DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

PERMITTEE INFORMATION

Town: **Thomaston, Connecticut**

Mailing Address: **158 Main Street**

Contact Person: **Glenn Clark** Title: **Hwy. Superint.**

Phone: **860-283-4030** Permit Registration #GSM: **000039**

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): **Sample ID: R-2-16 (Outfall From Basin At 182 Carter Road) Northing-290370, Easting-513000 (CT Grid System - Feet)**

Please check the appropriate area description: ☐ Industrial ☐ Commercial ☒ Residential

Receiving Water (name, basin): **Naugatuck River (6900)**

Time of Start of Discharge: **12:05 PM**

Date/Time Collected: **11/15/2016 12:15 PM** Water Temperature: **15.0 C**

Person Collecting Sample: **William Sirotnak (Weston & Sampson)**

Storm Magnitude (inches): **.66" (wunderground.com)** Storm Duration (hours): **8.0 hrs**

Date of Previous Storm Event: **10/30/2016**

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	SM 4500H+B	5.95(pH units)	Phoenix Environmental Lab
Rain pH	YSI pH Meter	6.30 (pH units)	By Sample Collector
Hardness	EPA 130.2	9.2(mg/l)	Phoenix Environmental Lab
Conductivity	SM2510B	37.0(umhos/cm)	Phoenix Environmental Lab
Oil & Grease	EPA 1664 Rev.A	<1.4(mg/l)	Phoenix Environmental Lab
COD	EPA 410.1	46.0(mg/l)	Phoenix Environmental Lab
Turbidity	EPA 180.1	111(NTU)	Phoenix Environmental Lab
TSS	SM2540D	55.0(mg/l)	Phoenix Environmental Lab
TP	EPA 365.3	0.700(mg/l)	Phoenix Environmental Lab
Ammonia	EPA 350.1	<0.05(mg/l)	Phoenix Environmental Lab
TKN	EPA 351.1	0.43(mg/l)	Phoenix Environmental Lab
NO_3+NO_2	SM 4500-NO3F	0.12(mg/l)	Phoenix Environmental Lab
E. coli	SM9222B/G	41.0(MPN/100 mls)	Phoenix Environmental Lab

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the MS4 General Permit. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: _____
(Print Name)

Signature: _____ Date: _____

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

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DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

PERMITTEE INFORMATION

Town: Thomaston, Connecticut

Mailing Address: 158 Main Street

Contact Person: Glenn Clark Title: Hwy. Superint.

Phone: 860-283-4030 Permit Registration #GSM: 000039

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): Sample ID: RV-1-16 (Naugatuck River at Electric Avenue) Northing-306662, Easting-512620 (CT Grid System - Feet)

Please check the appropriate area description: ☐ Industrial ☐ Commercial ☐ Residential

Receiving Water (name, basin): Naugatuck River (6900)

Time of Start of Discharge: Continuous Flow

Date/Time Collected: 11/15/2016 12:50 AM Water Temperature: 15.0 C

Person Collecting Sample: William Sirotnak (Weston & Sampson)

Storm Magnitude (inches): .66" (wunderground.com) Storm Duration (hours): 8.0 hrs

Date of Previous Storm Event: 10/30/2016

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	SM 4500H+B	7.64(pH units)	Phoenix Environmental Lab
Rain pH	YSI pH Meter	6.30(pH units)	By Sample Collector
Hardness	EPA 130.2	75.7(mg/l)	Phoenix Environmental Lab
Conductivity	SM2510B	440(umhos/cm)	Phoenix Environmental Lab
Oil & Grease	EPA 1664 Rev.A	<1.4(mg/l)	Phoenix Environmental Lab
COD	EPA 410.1	12.0(mg/l)	Phoenix Environmental Lab
Turbidity	EPA 180.1	23.6(NTU)	Phoenix Environmental Lab
TSS	SM2540D	9.0(mg/l)	Phoenix Environmental Lab
TP	EPA 365.3	.451(mg/l)	Phoenix Environmental Lab
Ammonia	EPA 350.1	<0.05(mg/l)	Phoenix Environmental Lab
TKN	EPA 351.1	0.46(mg/l)	Phoenix Environmental Lab
NO_3+NO_2	SM 4500-NO3F	1.18(mg/l)	Phoenix Environmental Lab
E. coli	SM9222B/G	41.0(MPN/100 mls)	Phoenix Environmental Lab

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the MS4 General Permit. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: _____
(Print Name)

Signature: _____ Date: _____

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

Stormwater Monitoring Report Form

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DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

PERMITTEE INFORMATION

Town: **Thomaston, Connecticut**

Mailing Address: **158 Main Street**

Contact Person: **Glenn Clark** Title: **Hwy. Superint.**

Phone: **860-283-4030** Permit Registration #GSM: **000039**

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): **Sample ID: RV-2-16 (Naugatuck River Near Railroad Bridge) Northing-290642, Easting-510624 (CT Grid System - Feet)**

Please check the appropriate area description: ☐ Industrial ☐ Commercial ☐ Residential

Receiving Water (name, basin): **Naugatuck River (6900)**

Time of Start of Discharge: **Continuous Flow**

Date/Time Collected: **11/15/2016 13:00 PM** Water Temperature: **15.0 C**

Person Collecting Sample: **William Sirotnak (Weston & Sampson)**

Storm Magnitude (inches): **.66" (wunderground.com)** Storm Duration (hours): **8.0 hrs**

Date of Previous Storm Event: **10/30/2016**

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	SM 4500H+B	7.73(pH units)	Phoenix Environmental Lab
Rain pH	YSI pH Meter	6.30(pH units)	By Sample Collector
Hardness	EPA 130.2	78.4(mg/l)	Phoenix Environmental Lab
Conductivity	SM2510B	439(umhos/cm)	Phoenix Environmental Lab
Oil & Grease	EPA 1664 Rev.A	<1.4(mg/l)	Phoenix Environmental Lab
COD	EPA 410.1	14.0(mg/l)	Phoenix Environmental Lab
Turbidity	EPA 180.1	1.71(NTU)	Phoenix Environmental Lab
TSS	SM2540D	<5.0(mg/l)	Phoenix Environmental Lab
TP	EPA 365.3	0.459(mg/l)	Phoenix Environmental Lab
Ammonia	EPA 350.1	<0.05(mg/l)	Phoenix Environmental Lab
TKN	EPA 351.1	0.46(mg/l)	Phoenix Environmental Lab
NO_3+NO_2	SM 4500-NO3F	1.18(mg/l)	Phoenix Environmental Lab
E. coli	SM9222B/G	41.0(MPN/100mls)	Phoenix Environmental Lab

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the MS4 General Permit. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: _____
(Print Name)

Signature: _____ Date: _____

PHOENIX
Environmental Laboratories, Inc.

Tuesday, November 29, 2016

Attn: Mr. Jeff Willson
Weston & Sampson
273 Dividend Rd
Rocky Hill, CT 06067

Project ID: THOMASTON STORMWATER
Sample ID#s: BV83106 - BV83111

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 29, 2016

FOR: Attn: Mr. Jeff Willson
Weston & Sampson
273 Dividend Rd
Rocky Hill, CT 06067

Sample Information		Custody Information		Date	Time
Matrix:	STORM WATER	Collected by:		11/15/16	12:50
Location Code:	WESTSAMPDAS	Received by:	LB	11/15/16	15:03
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBV83106
Phoenix ID: BV83106

Project ID: THOMASTON STORMWATER
Client ID: RV-1-16

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Hardness (CaCO3)	75.7	0.1	mg/L	1	11/17/16		E200.7
Escherichia Coli	41	10	MPN/100 mls	10	11/15/16 17:55	:B/RM/KDI	SM9223B-04
Total Coliforms	4110	10	MPN/100 mls	10	11/15/16 17:55	:B/RM/KDI	SW9223B
C.O.D.	12	10	mg/L	1	11/17/16	MSF	SM5220D-97
Conductivity	440	5.00	umhos/cm	1	11/16/16	RR/EG	SM2510B-97
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	11/21/16	WHM	E350.1
Nitrate-Nitrite (N)	1.18	0.01	mg/L	1	11/16/16	BS/EG	E300.0
Oil and Grease by EPA 1664	< 1.4	1.4	mg/L	1	11/18/16	MSF	E1664A
pH	7.64	0.10	pH Units	1	11/16/16 00:58	RR/EG	SM4500-H B-00
Nitrogen Tot Kjeldahl	0.46	0.10	mg/L	1	11/21/16	WHM	E351.1
Phosphorus, as P	0.451	0.010	mg/L	1	11/23/16	JR	SM4500PE-99
Total Suspended Solids	9.0	5.0	mg/L	1	11/17/16	KH	SM2540D-97
Turbidity	23.6	0.20	NTU	1	11/15/16 18:13	RWR	SM2130B-01
Total Metals Digestion	Completed				11/15/16	AG	

Project ID: THOMASTON STORMWATER
Client ID: RV-1-16

Phoenix I.D.: BV83106

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

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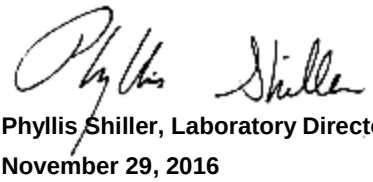

Phyllis Shiller, Laboratory Director

November 29, 2016

Reviewed and Released by: Ethan Lee, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 29, 2016

FOR: Attn: Mr. Jeff Willson
Weston & Sampson
273 Dividend Rd
Rocky Hill, CT 06067

Sample Information		Custody Information		Date	Time
Matrix:	STORM WATER	Collected by:		11/15/16	13:00
Location Code:	WESTSAMPDAS	Received by:	LB	11/15/16	15:03
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBV83106
Phoenix ID: BV83107

Project ID: THOMASTON STORMWATER
Client ID: RV-2-16

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Hardness (CaCO3)	78.4	0.1	mg/L	1	11/17/16		E200.7
Escherichia Coli	41	10	MPN/100 mls	10	11/15/16 17:55	:B/RM/KDI	SM9223B-04
Total Coliforms	6490	10	MPN/100 mls	10	11/15/16 17:55	:B/RM/KDI	SW9223B
C.O.D.	14	10	mg/L	1	11/17/16	MSF	SM5220D-97
Conductivity	439	5.00	umhos/cm	1	11/16/16	RR/EG	SM2510B-97
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	11/21/16	WHM	E350.1
Nitrate-Nitrite (N)	1.18	0.01	mg/L	1	11/16/16	BS/EG	E300.0
Oil and Grease by EPA 1664	< 1.4	1.4	mg/L	1	11/18/16	MSF	E1664A
pH	7.73	0.10	pH Units	1	11/16/16 01:01	RR/EG	SM4500-H B-00
Nitrogen Tot Kjeldahl	0.46	0.10	mg/L	1	11/21/16	WHM	E351.1
Phosphorus, as P	0.459	0.010	mg/L	1	11/23/16	JR	SM4500PE-99
Total Suspended Solids	< 5.0	5.0	mg/L	1	11/17/16	KH	SM2540D-97
Turbidity	1.71	0.20	NTU	1	11/15/16 18:13	RWR	SM2130B-01
Total Metals Digestion	Completed				11/15/16	AG	

Project ID: THOMASTON STORMWATER
Client ID: RV-2-16

Phoenix I.D.: BV83107

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

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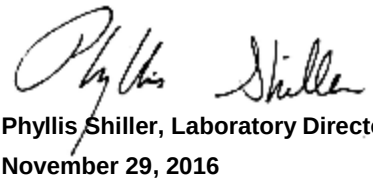

Phyllis Shiller, Laboratory Director

November 29, 2016

Reviewed and Released by: Ethan Lee, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 29, 2016

FOR: Attn: Mr. Jeff Willson
Weston & Sampson
273 Dividend Rd
Rocky Hill, CT 06067

Sample Information		Custody Information		Date	Time
Matrix:	STORM WATER	Collected by:		11/15/16	12:00
Location Code:	WESTSAMPDAS	Received by:	LB	11/15/16	15:03
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBV83106
Phoenix ID: BV83108

Project ID: THOMASTON STORMWATER
Client ID: R-1-16

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Hardness (CaCO3)	16.3	0.1	mg/L	1	11/17/16		E200.7
Escherichia Coli	6490	10	MPN/100 mls	10	11/15/16 17:55	:B/RM/KDI	SM9223B-04
Total Coliforms	>24200	10	MPN/100 mls	10	11/15/16 17:55	:B/RM/KDI	SW9223B
C.O.D.	247	10	mg/L	1	11/17/16	MSF	SM5220D-97
Conductivity	29	5.00	umhos/cm	1	11/16/16	RR/EG	SM2510B-97
Ammonia as Nitrogen	0.25	0.05	mg/L	1	11/21/16	WHM	E350.1
Nitrate-Nitrite (N)	0.22	0.01	mg/L	1	11/16/16	BS/EG	E300.0
Oil and Grease by EPA 1664	7.8	1.4	mg/L	1	11/18/16	MSF	E1664A
pH	6.94	0.10	pH Units	1	11/16/16 01:04	RR/EG	SM4500-H B-00
Nitrogen Tot Kjeldahl	2.76	0.10	mg/L	1	11/21/16	WHM	E351.1
Phosphorus, as P	0.901	0.020	mg/L	2	11/23/16	JR	SM4500PE-99
Total Suspended Solids	240	10	mg/L	2	11/17/16	KH	SM2540D-97
Turbidity	1.79	0.20	NTU	1	11/15/16 18:14	RWR	SM2130B-01
Total Metals Digestion	Completed				11/15/16	AG	

Project ID: THOMASTON STORMWATER
Client ID: R-1-16

Phoenix I.D.: BV83108

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

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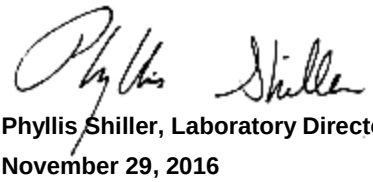

Phyllis Shiller, Laboratory Director

November 29, 2016

Reviewed and Released by: Ethan Lee, Project Manager

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Analysis Report

November 29, 2016

FOR: Attn: Mr. Jeff Willson
Weston & Sampson
273 Dividend Rd
Rocky Hill, CT 06067

Sample Information		Custody Information		Date	Time
Matrix:	STORM WATER	Collected by:		11/15/16	12:15
Location Code:	WESTSAMPDAS	Received by:	LB	11/15/16	15:03
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBV83106
Phoenix ID: BV83109

Project ID: THOMASTON STORMWATER
Client ID: R-2-16

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Hardness (CaCO3)	9.2	0.1	mg/L	1	11/17/16		E200.7
Escherichia Coli	41	10	MPN/100 mls	10	11/15/16 17:55	:B/RM/KDI	SM9223B-04
Total Coliforms	>24200	10	MPN/100 mls	10	11/15/16 17:55	:B/RM/KDI	SW9223B
C.O.D.	46	10	mg/L	1	11/17/16	MSF	SM5220D-97
Conductivity	37	5.00	umhos/cm	1	11/16/16	RR/EG	SM2510B-97
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	11/21/16	WHM	E350.1
Nitrate-Nitrite (N)	0.12	0.01	mg/L	1	11/16/16	BS/EG	E300.0
Oil and Grease by EPA 1664	< 1.4	1.4	mg/L	1	11/18/16	MSF	E1664A
pH	5.95	0.10	pH Units	1	11/16/16 01:12	RR/EG	SM4500-H B-00
Nitrogen Tot Kjeldahl	0.43	0.10	mg/L	1	11/21/16	WHM	E351.1
Phosphorus, as P	0.700	0.010	mg/L	1	11/23/16	JR	SM4500PE-99
Total Suspended Solids	55	5.0	mg/L	1	11/17/16	KH	SM2540D-97
Turbidity	111	0.20	NTU	1	11/15/16 18:15	RWR	SM2130B-01
Total Metals Digestion	Completed				11/15/16	AG	

Project ID: THOMASTON STORMWATER
Client ID: R-2-16

Phoenix I.D.: BV83109

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

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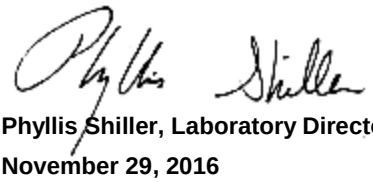

Phyllis Shiller, Laboratory Director

November 29, 2016

Reviewed and Released by: Ethan Lee, Project Manager

Environmental Laboratories, Inc.
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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 29, 2016

FOR: Attn: Mr. Jeff Willson
Weston & Sampson
273 Dividend Rd
Rocky Hill, CT 06067

Sample Information		Custody Information		Date	Time
Matrix:	STORM WATER	Collected by:		11/15/16	12:30
Location Code:	WESTSAMPDAS	Received by:	LB	11/15/16	15:03
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBV83106
Phoenix ID: BV83110

Project ID: THOMASTON STORMWATER
Client ID: I-1-16

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Hardness (CaCO3)	2.1	0.1	mg/L	1	11/17/16		E200.7
Escherichia Coli	41	10	MPN/100 mls	10	11/15/16 17:55	:B/RM/KDI	SM9223B-04
Total Coliforms	>24200	10	MPN/100 mls	10	11/15/16 17:55	:B/RM/KDI	SW9223B
C.O.D.	14	10	mg/L	1	11/17/16	MSF	SM5220D-97
Conductivity	11	5.00	umhos/cm	1	11/16/16	RR/EG	SM2510B-97
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	11/21/16	WHM	E350.1
Nitrate-Nitrite (N)	0.06	0.01	mg/L	1	11/16/16	BS/EG	E300.0
Oil and Grease by EPA 1664	< 1.4	1.4	mg/L	1	11/21/16	MSF	E1664A
pH	6.44	0.10	pH Units	1	11/16/16 01:15	RR/EG	SM4500-H B-00
Nitrogen Tot Kjeldahl	0.23	0.10	mg/L	1	11/21/16	WHM	E351.1
Phosphorus, as P	0.081	0.010	mg/L	1	11/23/16	JR	SM4500PE-99
Total Suspended Solids	6.0	5.0	mg/L	1	11/17/16	KH	SM2540D-97
Turbidity	8.82	0.20	NTU	1	11/15/16 18:15	RWR	SM2130B-01
Total Metals Digestion	Completed				11/15/16	AG	

Project ID: THOMASTON STORMWATER
Client ID: I-1-16

Phoenix I.D.: BV83110

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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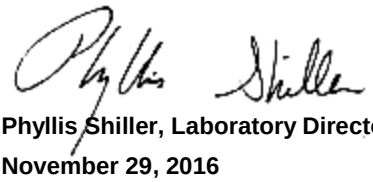

Phyllis Shiller, Laboratory Director

November 29, 2016

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Analysis Report

November 29, 2016

FOR: Attn: Mr. Jeff Willson
Weston & Sampson
273 Dividend Rd
Rocky Hill, CT 06067

Sample Information		Custody Information		Date	Time
Matrix:	STORM WATER	Collected by:		11/15/16	12:40
Location Code:	WESTSAMPDAS	Received by:	LB	11/15/16	15:03
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBV83106
Phoenix ID: BV83111

Project ID: THOMASTON STORMWATER
Client ID: C-1-16

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Hardness (CaCO3)	16.2	0.1	mg/L	1	11/17/16		E200.7
Escherichia Coli	<10	10	MPN/100 mls	10	11/15/16 17:55	:B/RM/KDI	SM9223B-04
Total Coliforms	>24200	10	MPN/100 mls	10	11/15/16 17:55	:B/RM/KDI	SW9223B
C.O.D.	283	10	mg/L	1	11/17/16	MSF	SM5220D-97
Conductivity	18	5.00	umhos/cm	1	11/16/16	RR/EG	SM2510B-97
Ammonia as Nitrogen	0.24	0.05	mg/L	1	11/21/16	WHM	E350.1
Nitrate-Nitrite (N)	0.06	0.01	mg/L	1	11/16/16	BS/EG	E300.0
Oil and Grease by EPA 1664	9.6	1.4	mg/L	1	11/21/16	MSF	E1664A
pH	6.67	0.10	pH Units	1	11/16/16 01:18	RR/EG	SM4500-H B-00
Nitrogen Tot Kjeldahl	2.74	0.10	mg/L	1	11/21/16	WHM	E351.1
Phosphorus, as P	1.08	0.020	mg/L	2	11/23/16	JR	SM4500PE-99
Total Suspended Solids	750	5.0	mg/L	1	11/17/16	KH	SM2540D-97
Turbidity	37.1	0.20	NTU	1	11/15/16 18:16	RWR	SM2130B-01
Total Metals Digestion	Completed				11/15/16	AG	

Project ID: THOMASTON STORMWATER
Client ID: C-1-16

Phoenix I.D.: BV83111

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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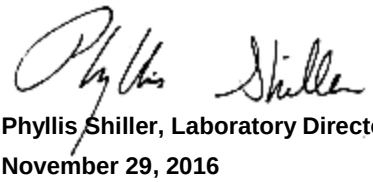

Phyllis Shiller, Laboratory Director

November 29, 2016

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Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

November 29, 2016

QA/QC Data

SDG I.D.: GBV83106

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 367327 (mg/L), QC Sample No: BV82972 (BV83106, BV83107, BV83108, BV83109)													
Oil and Grease by EPA 1664A	BRL	1.4				98.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 366877 (NTU), QC Sample No: BV82974 (BV83106, BV83107, BV83108, BV83109, BV83110, BV83111)													
Turbidity	BRL	0.20	125	122	2.40	98.3						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 367008 (umhos/cm), QC Sample No: BV82979 (BV83106, BV83107, BV83108, BV83109, BV83110, BV83111)													
Conductivity	BRL	5.00	30	31.1	3.60	95.2						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 366990 (pH), QC Sample No: BV82979 (BV83106, BV83107, BV83108, BV83109, BV83110, BV83111)													
pH			6.62	6.83	3.10	98.9						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 367424 (mg/L), QC Sample No: BV83081 (BV83106, BV83107, BV83108, BV83109, BV83110, BV83111)													
Ammonia as Nitrogen	BRL	0.05	1.58	1.58	0	100			102			85 - 115	20
Nitrogen Tot Kjeldahl	BRL	0.10	4.67	4.64	0.60	89.1			84.5			85 - 115	20
QA/QC Batch 367128 (mg/L), QC Sample No: BV83102 (BV83106, BV83107, BV83108, BV83109, BV83110, BV83111)													
C.O.D.	BRL	10	24	24	NC	99.7			102			85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 367846 (mg/L), QC Sample No: BV83102 (BV83106, BV83107, BV83108, BV83109, BV83110, BV83111)													
Phosphorus, as P	BRL	0.01	0.095	0.09	5.40	105			103			85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 367522 (mg/L), QC Sample No: BV83110 (BV83110, BV83111)													
Oil and Grease by EPA 1664A	BRL	1.4				99.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 367137 (mg/L), QC Sample No: BV83110 (BV83106, BV83107, BV83108, BV83109, BV83110, BV83111)													
Total Suspended Solids	BRL	5.0	6.0	6.0	NC	95.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 366986 (mg/kg), QC Sample No: BV83111 (BV83111)													
Nitrate as Nitrate	BRL		0.06	0.0562	NC	98.8			92.0			90 - 110	30
QA/QC Batch 366987 (mg/kg), QC Sample No: BV83168 (BV83106, BV83107, BV83108, BV83109, BV83110, BV83111)													
Nitrate as Nitrate	BRL		0.18	0.175	NC	97.7			92.1			90 - 110	30

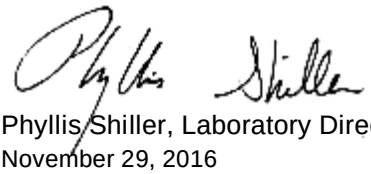
QA/QC Data

SDG I.D.: GBV83106

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference



Phyllis Shiller, Laboratory Director
November 29, 2016

Tuesday, November 29, 2016

Criteria: None

State: CT

Sample Criteria Exceedances Report

GBV83106 - WESTSAMPDAS

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

REASONABLE CONFIDENCE PROTOCOL
LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

Laboratory Name: Phoenix Environmental Labs, Inc. ***Client:*** Weston & Sampson

Project Location: THOMASTON STORMWATER ***Project Number:***

Laboratory Sample ID(s): BV83106-BV83111 ***Sampling Date(s):*** 11/15/2016

List RCP Methods Used (e.g., 8260, 8270, et cetera) None

1	**For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?**	☑ Yes ☐ No
1A	**Were the method specified preservation and holding time requirements met?**	☑ Yes ☐ No
1B	***VPH and EPH methods only:*** **Was the VPH or EPH method conducted without significant modifications (see section 11.3 of respective RCP methods)**	☐ Yes ☐ No ☑ NA
2	**Were all samples received by the laboratory in a condition consistent with that described on the associated Chain-of-Custody document(s)?**	☑ Yes ☐ No
3	**Were samples received at an appropriate temperature (< 6 Degrees C)?**	☑ Yes ☐ No ☐ NA
4	**Were all QA/QC performance criteria specified in the CTDEP Reasonable Confidence Protocol documents achieved?**	☑ Yes ☐ No
5	**a) Were reporting limits specified or referenced on the chain-of-custody?** **b) Were these reporting limits met?**	☐ Yes ☑ No ☑ Yes ☐ No
6	**For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?**	☐ Yes ☑ No
7	**Are project-specific matrix spikes and laboratory duplicates included in the data set?**	☐ Yes ☑ No

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A or 1B is "No", the data package does not meet the requirements for "Reasonable Confidence". This form may not be altered and all questions must be answered.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.

Authorized Signature: Ethan Lee **Position:** Project Manager

Printed Name: Ethan Lee **Date:** Tuesday, November 29, 2016

Name of Laboratory Phoenix Environmental Labs, Inc.

This certification form is to be used for RCP methods only.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

RCP Certification Report

November 29, 2016

SDG I.D.: GBV83106

SDG Comments

No RCP analyses are included with this report. The RCP narrative is provided at the request of the client.

Wet Chemistry Analysis

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

Instrument:

BECKMAN DU640 11/23/16-3 Jean Rawling, Chemist 11/23/16

BV83106, BV83107, BV83108, BV83109, BV83110, BV83111

The initial calibration met all criteria including a standard run at the reporting level.
All method verification standards and blanks met criteria.

HACH DR 5000 11/17/16-1

BV83106, BV83107, BV83108, BV83109, BV83110, BV83111

The initial calibration met all criteria including a standard run at the reporting level.
All method verification standards and blanks met criteria.

QC (Batch Specific):

Batch 366877 (BV82974)

BV83106, BV83107, BV83108, BV83109, BV83110, BV83111

All LCS recoveries were within 85 - 115 with the following exceptions: None.
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.

Batch 366990 (BV82979)

BV83106, BV83107, BV83108, BV83109, BV83110, BV83111

All LCS recoveries were within 85 - 115 with the following exceptions: None.
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.

Batch 367008 (BV82979)

BV83106, BV83107, BV83108, BV83109, BV83110, BV83111

All LCS recoveries were within 85 - 115 with the following exceptions: None.
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.

Batch 367128 (BV83102)

BV83106, BV83107, BV83108, BV83109, BV83110, BV83111

All LCS recoveries were within 85 - 115 with the following exceptions: None.
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.

Batch 367137 (BV83110)

BV83106, BV83107, BV83108, BV83109, BV83110, BV83111

All LCS recoveries were within 85 - 115 with the following exceptions: None.
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.

Batch 367327 (BV82972)

BV83106, BV83107, BV83108, BV83109

All LCS recoveries were within 85 - 115 with the following exceptions: None.

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NY # 11301

RCP Certification Report

November 29, 2016

SDG I.D.: GBV83106

Wet Chemistry Analysis

Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.

Batch 367522 (BV83110)

BV83110, BV83111

All LCS recoveries were within 85 - 115 with the following exceptions: None.
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.

Batch 367846 (BV83102)

BV83106, BV83107, BV83108, BV83109, BV83110, BV83111

All LCS recoveries were within 85 - 115 with the following exceptions: None.
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.

IC

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

Instrument:

IC 11/15/16-1 Brian Sheriden, Eric Geyer, Chemist 11/15/16

BV83106, BV83107, BV83108, BV83109, BV83110, BV83111

The initial calibration met all criteria including a standard run at the reporting level.
All method verification standards and blanks met criteria.

QC (Batch Specific):

Batch 366987 (BV83168)

BV83106, BV83107, BV83108, BV83109, BV83110, BV83111

All LCS recoveries were within 90 - 110 with the following exceptions: None.

QC (Site Specific):

Batch 366986 (BV83111)

BV83111

All LCS recoveries were within 90 - 110 with the following exceptions: None.
All MS recoveries were within 90 - 110 with the following exceptions: None.

LACHAT

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

Instrument:

IC 11/15/16-1 Brian Sheriden, Eric Geyer, Chemist 11/15/16

BV83111

NITROGEN

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NY # 11301

RCP Certification Report

November 29, 2016

SDG I.D.: GBV83106

NITROGEN

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

Instrument:

LACHAT 11/21/16-1 William H. McKernan, Chemist 11/21/16

BV83106, BV83107, BV83108, BV83109, BV83110, BV83111

The initial calibration met all criteria including a standard run at the reporting level.
All method verification standards and blanks met criteria.

QC (Batch Specific):

Batch 367424 (BV83081)

BV83106, BV83107, BV83108, BV83109, BV83110, BV83111

All LCS recoveries were within 85 - 115 with the following exceptions: None.

Temperature Narration

The samples in this delivery group were received at 1°C.
(Note acceptance criteria is above freezing up to 6°C)

Cooler: Yes ☒ No ☐
Coolant: IPK ☐ ICE ☒ No ☐
Temp ° C Pg of

CHAIN OF CUSTODY RECORD

PHOENIX Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Data Delivery:
☐ Fax#:
☒ Email: WillsonJ@wseinc.com

Customer: Weston + Samyson
Address: 273 Dividend Rd
Rocky Hill, CT 06067

Project: Thomaston Stormwater
Report to: Jeff Willson
Invoice to: Ed Mone - Town of Thomaston
Phone #: 860-513-1473
Fax#:

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature [signature] Date: 11-15-16

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe
OIL=Oil **B**=Bulk **L**=Liquid

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	PH + Conductance	Hardness	Oil + Grease	CoD	Turbidity + TSS	Total Phosphorus	Ammonia, TKN	NO2-NO3	E. Coli			Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( ) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [ ] HCl	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle	
83106	RV-1-16	SW	11-15-16	1250	X	X	X	X	X	X	X	X	X							1	1	1	1		1	
83107	RV-2-16			1300	X	X	X	X	X	X	X	X	X							1	1	1	1		1	
83108	R-1-16			1200	X	X	X	X	X	X	X	X	X							1	1	1	1		1	
83109	R-2-16			1215	X	X	X	X	X	X	X	X	X							1	1	1	1		1	
83110	I-1-16			1230	X	X	X	X	X	X	X	X	X							1	1	1	1		1	
83111	C-1-16			1240	X	X	X	X	X	X	X	X	X							1	1	1	1		1	

Relinquished by:	Accepted by:	Date:	Time:
[signature]	CParadine	11/15/16	1503

Comments, Special Requirements or Regulations:
Bill town of Thomaston Directly
VIA DAS Contract.
Care of Ed Mone - First Selectman

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ Direct Exposure (Residential)
☐ GW
☐ Other

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1
☐ S-2
☐ S-3
☐ MWRA eSMART
☐ Other

State where samples were collected: CT

Data Format
☒ Excel
☒ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

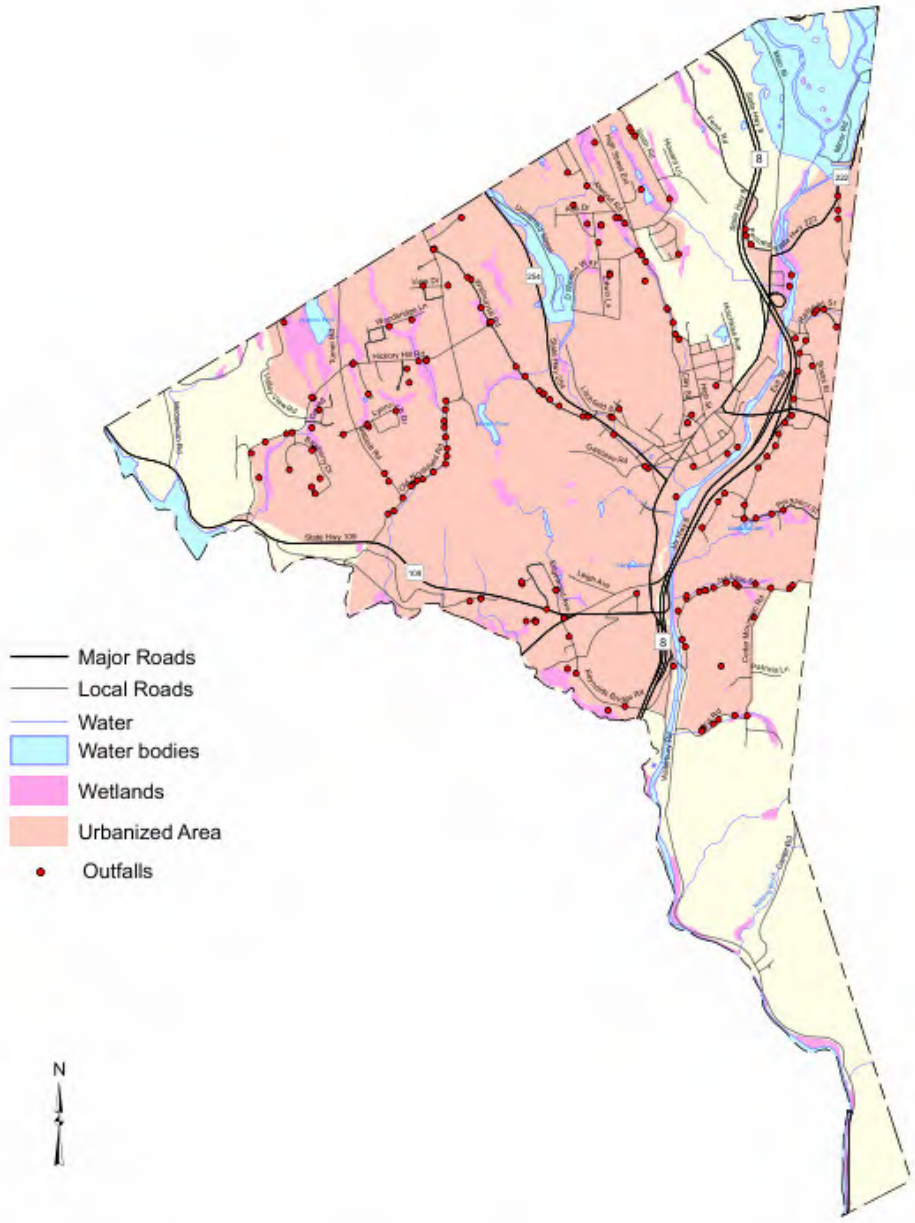
Data Package
☐ Tier II Checklist
☐ Full Data Package*
☐ Phoenix Std Report
☐ Other
* SURCHARGE APPLIES

APPENDIX B:

STORM SEWER SYSTEM MAP

Thomaston

Urbanized Areas and Storm Water Outfalls



Source:"Roads", GDT
"Town Boundary", "Hydrography", "Wetlands", DEP
"Urbanized Area Boundary", U. S. Census Bureau
"Outfalls", Collected by Town

For general planning purposes only. Delineations may not be exact.
March 2006

COUNCIL OF GOVERNMENTS
CENTRAL NAUGATUCK VALLEY

Note: Reproduced from Town's website at:
http://www.thomastonct.org/images/customer-files/ThomastonOutfalls811.pdf