



DRAFT
December 2, 2010

City of New London, Connecticut

General Permit for the Discharge of Stormwater from Small
Municipal Separate Storm Sewer Systems

Permit Number: GSM00111

Annual Report for 2010

Storm Water Management Plan

Introduction

The City of New London (the City) is submitting this annual report to the Connecticut Department of Environmental Protection (CTDEP) as part of their "General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems" (The Permit). The intention of this report is to document the Minimum Control Measures and Best Management Practices undertaken by the City for the 2010 calendar year.

This report was available for review and comment by the public for thirty days (30) as required by the Permit Guidelines and specified in a legal notice posted on the City's website and in the local newspaper, The New London Day (Attachment A). The City has paid the applicable fee to the CTDEP for filing of this annual report.

In compliance with the Permit, the City, through Black & Veatch Corporation, created a Storm Water Management Plan dated August 2007. The plan is available for review at the City of New London's City Clerk's Office, the Department of Public Works Office, the Office of Development and Planning and on the City's web site. The Storm Water Management Plan details the steps New London will take to meet the following minimum control measures:

1. Public Education and Outreach on Stormwater Impacts
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff Control
5. Postconstruction Stormwater Management in New Development and Redevelopment
6. Pollution Prevention and Good Housekeeping for Municipal Operations

As required by the permit, the City must submit an annual report to the CTDEP after the appropriate review period. This report will serve as the Annual Report for the 2010 calendar year covering the Best Management Practices (BMPs) the City implemented.

Minimum Control Measure Number 1: Public Education

The CTDEP Permit requires that the City develop and implement a public education program to distribute educational materials to the community or conduct other outreach activities explaining the impacts of stormwater discharges on water bodies and the steps that can be taken to reduce stormwater pollution. The public education program must reach residents and business owners throughout the community.

The City has developed specific educational materials to be used at public meetings and available to community outreach groups. The City's BMP initiatives outlined in the MS4 permit and to what extent they were able to comply are outlined below.

- 1.1 Brochures/Fact Sheets – The City has developed a tri-fold public education brochure titled: Every day solutions to protect our water from stormwater pollution; A guide to healthy habits for cleaner water that has been posted on the City's website and are

available at the Public Works main office at 111 Union Street. A copy of the brochure has been appended.

- 1.2 City's Website – The City's website has available the 2004-2007 combined as well as the 2008 General Permit of Stormwater from Small Municipal Separate Storm Sewer Systems, permit number GSM00111. The website also has the 2008 and 2009 Stormwater Management Plans. The public education brochure (Item 1.1) is posted on both the City's main page and on the Public Works main page.
- 1.3 Library of Educational Materials – While the City's employees have tried to keep a library or materials available, this has not always been possible, yet the City's employees have always been willing to gather information as needed for the public's use.
- 1.4 Storm Drain Marking/Stenciling – The City has purchased 500 storm drain markers and has installed 45 markers in 2010. A coordinated community outreach educational volunteer program is planned to install the remaining markers in 2011.
- 1.5 Household Hazardous Waste Days – The City is a member of the Southeastern Connecticut Regional Resources Recovery Authority, which coordinates hazardous material collection days for its member towns approximately nine times throughout the year, typically once a month from April to November. The collection sites are rotated among the towns. The three towns/cities of Waterford, East Lyme, and New London host their town's/city's site on a routine rotating basis every three years. 2008 was New London's turn and will be again in 2011.

Minimum Control Measure Number 2: Public Participation

The public involvement and participation element is intended to increase the chances of success of the plan. For this control measure, the permit requires the City to:

- i. Comply with state and local public notice and Freedom of Information requirements when implementing a public involvement/participation program. When notice requirements are inconsistent, the notice provisions providing for the most notices and opportunities for public comment shall be followed.
- ii. Develop a public involvement/participation program that includes the public in developing, implementing, and reviewing the stormwater management program.

In addition, Section 4(d) of the permit requires that a draft copy of this plan be made available for public review and comment 30 days before it is submitted to the CTDEP. In addition, the required annual reports that must be submitted to the CTDEP also must be made available for public comment 30 days before they are submitted.

The City's BMP initiatives outlined in the MS4 permit and to what extent they were able to comply are outlined below.

- 2.1 Develop Public Involvement/Participation Program – The City's Park Division was actively engaged with community groups for many of the City's parks in 2010. While the City does not have a formal program to involve the community, it welcomes the participation of anyone to beautify the City of New London. Among these efforts put forth by the community are the following:
- The City of New London's Park Division was actively engaged with citizens in several repeated annual neighborhood park cleanups in 2010. The Parks Division also coordinated a crew of volunteers called "Sound Community Services" to clean up parks on an ongoing basis.
 - City parks where cleanup events were organized included Bartlett Park, Bates Woods Park, Mahan Park, Toby May Park, and Williams Park.
 - The City of New London is engaged in a collaborative project with Dominion Power Group, Connecticut College, and the Coast Guard Academy in developing an outdoor classroom to be located on New London High School grounds, which will educate students on erosion control, sheet flow, vegetation management, and identification.
 - The Save Ocean Beach conservation group was involved in their ongoing program to continue to development pathway-planting programs to minimize the erosion along the city beaches.
 - The Old Mill vegetation-planting program continues to be successful in keeping vegetation thriving along the tributary to the Thames River.
 - The Learn and Serve Program instituted at the New London High School continues to focus on the understanding and maintaining of the ecosystem of Bates Wood Park.
- 2.2 Comply with State and Local Public Notice and Freedom of Information Requirements – The City fully adheres to the public notice regulations and the Freedom of Information Act requirements when it has any material to release to the public. When there are legal notices to be published, it is done in The Day (the local newspaper) as well as on the City's website. Previous stormwater management plans and annual reports are available at all times on the City's website, the City Clerk's Office, the Department of Public Works Office, and Office of Development and Planning.
- 2.3 Public Review and Comment – When the City has any new information or reports completed, it displays them at various points throughout the City for review and comment. It would also post them on their website for any person to view. This report was made available to the public on December 6, 2010 and the 30 day comment period ends January 5, 2011.
- 2.4 Brochures at City Hall and City Departments – The City maintains copies of the pertinent public information materials as identified in BMP 1.1 at the Public Works Main Office at 111 Union Street.
- 2.5 Storm Drain Marking / Stenciling – The City has purchased 500 storm drain markers and has installed 45 markers in 2010. A coordinated community outreach educational volunteer program is planned to install the remaining markers in 2011.

Minimum Control Measure Number 3: Illicit Discharge Detection and Elimination

Because illicit discharges may have significant impacts on receiving waters, the CTDEP's General Permit requires New London to address the following elements:

- i. Implement an ordinance or other regulatory mechanism to effectively prohibit nonstormwater discharges (except those allowed in Section 3(a)(2) of the permit) into the storm drainage system as well as sanctions to ensure compliance, to the extent allowable under state and local law.
- ii. Inform public employees, businesses, and the general public of the hazards associated with illegal discharges and improper disposal of waste.
- iii. By the end of Year 3, expand the required storm drainage system map to identify all outfalls in the municipality 15 inches in diameter or greater.
- iv. By the end of Year 2, develop a map or series of maps showing all stormwater discharges from a pipe or conduit with a diameter of 15 inches or greater (or equivalent cross-sectional area) that is operated or owned by the municipality. The map should depict the size of the pipe, the material of construction, and the name and water quality classification of the receiving water and watershed. Grass swales and other stormwater conveyances should also be mapped.
- v. By the end of Year 4, expand the storm drainage mapping to depict outfalls 12 inches in diameter or greater.
- vi. Develop, implement, and enforce a program to detect and eliminate existing illicit discharges.
- vii. Develop and implement a plan to detect and address future nonstormwater discharges (including illegal dumping).

The following describes how each of these is being addressed:

- 3.1 Item I – Adopt an ordinance. The City developed an illicit discharge ordinance in 2009 to be incorporated as Article V of the Code of Ordinances. Due to budgetary constraints, this ordinance was not adopted in 2010. Following appropriate review by City staff and legal counsel, the ordinance will be put to vote for adoption in 2011. A copy of the draft ordinance is presented in Attachment B.
- 3.2 Item ii – Inform employees, businesses and the public. The public education program being implemented under Minimum Control Measure 1 will serve to educate residents and staff on illicit discharge avoidance.
- 3.3 Items iii, iv, and v – Drainage System Mapping. Due to the shortage of budget and personnel and personnel turnover, the outfalls have not been mapped, nor has a program

to detect illicit discharges within the storm drainage system been developed. However, any new surveys completed in support of various City projects are incorporated into the existing GIS database at the City Engineer's office in an effort to build a database of stormwater-related infrastructure.

- 3.4 Items vi and vii – Illicit discharge detection and elimination program development and implementation. While the City does not have a specific program for the training of the Public Works Department (PWD) personnel regarding the outfall and drainage system inspection, as maintenance is performed staff is being informally trained by the Engineering Department to identify potential problems and corrective actions.

Minimum Control Measure Number 4: Construction Site Runoff Control

Specific requirements of this minimum control measure require the City to develop:

- i. An ordinance or other regulatory mechanism to require erosion and sediment controls and sanctions for noncompliance.
 - ii. Procedures for notifying site developers of the requirements for registering under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities.
 - iii. Requirements for construction site operators to implement erosion and sediment controls in accordance with the state guidelines.
 - iv. Requirements for construction site operators to control wastes such as building materials, concrete truck washout, chemicals, litter, and sanitary wastes.
 - v. Procedures for site plan review that incorporate consideration of potential water quality impacts.
 - vi. Procedures for receipt and consideration of public comments.
 - vii. Procedures for site inspection and enforcement of control measures.
- 4.1 Item I – Develop Sediment and Erosion Control Requirements. The City's Zoning Regulations in Section 800H currently have requirements for the development of Sediment and Erosion Control Plans for disturbance of any area greater than a half acre. This section appears to conform to the requirements of Public Act 83-388, "An Act Concerning Soil Erosion and Sediment Control." Therefore, this requirement has been met. However, the City's Zoning Commission intends to review potential regulation revisions in 2011 following receipt of the Flood Management draft regulations from the State of Connecticut. In particular, the commission will evaluate whether additional language should be incorporated into the specifications in both sets of regulations for the Erosion and Sediment Control Plan such as:

"The smallest practical area of land should be exposed at any one time during development. When land is exposed during development, the exposure should be kept to the shortest practical period of time. Land should not be left exposed during the winter months. Where necessary, temporary vegetation and/or mulching and structural measures may be required by the Zoning Enforcement Officer to protect areas exposed during the development. Sediment basins (debris basins, desilting basins, settling basins, or silt traps) shall be installed and maintained during development to remove sediment from runoff water and from land undergoing development. The 2002 Connecticut Guidelines for Soil Erosion and Sediment Control as amended (CT DEP) shall be followed. City of New London Standard Details shall be incorporated into the sediment and erosion control plan."

Additionally, the commission will evaluate whether the following language regarding sediment and erosion control measures should be incorporated into Section 440.1.i of the Subdivision Regulations:

"The map shall show the words 'Approved by the City Engineer or designee' with a designated place for the signature of the Engineer and date of signing."

- 4.2 Item ii – Notify Developers of Stormwater General Permit Requirements. Currently, there is no formal mechanism to provide notification to contractors and developers, but it is typically a condition of approval on any site plan that is reviewed by the commission. In 2011, the City intends to evaluate the need for a formal requirement in its permit applications in the form of a notification to the applicant. Sample language for this notation follows:

"The applicant is advised that permits that are administered by other permitting agencies such as the Connecticut Department of Environmental Protection (DEP) or the U.S. Army Corps of Engineers may be required for their project. Applicants are responsible for contacting these agencies to determine the appropriate permits for their project. Sites that disturb in excess of one acre of area must submit registration to the DEP for a General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities."

- 4.3 Item iii – Implement Requirements of Construction Site Operators. Section 800H.14 requires that site plans must include a sediment and erosion control plan that is consistent with the Connecticut Guidelines for Sediment and Erosion Control. A Sediment and Erosion Control Bond posting is required prior to the start of construction and the zoning regulations document to the right of the City to inspect construction activities and use the bond money to remedy conditions as necessary. The City does not always require a bond, but this Section allows them to require bonds if they deem them necessary. Therefore, this requirement has been met.

- 4.4 Item iv - Develop requirements for Waste Disposal on Construction Sites. The City's Zoning Regulations in Section 613 defines performance standards for properties within New London. Subsection 6 of this regulation specifically addresses the handling of hazardous materials but does not specifically address issues relating to construction debris. Typical conditions of approval on site plans address the proper disposal of construction debris by requiring appropriate off-site disposal. If contaminated materials are encountered, conditions of approval require proper disposal as well. The intent of the item is met via conditions of approval, but the commission will review whether regulatory language could be incorporated into the regulations to make this requirement more formal. A draft of this language follows:

"No refuse or other waste materials and no liquids shall be dumped on any lot except with the approval of the Director of Health of the City of New London and the Zoning Commission. No refuse or other waste materials and no liquids shall be dumped on any lot or dumped or discharged into any river, stream, watercourses, storm drain, pond, lake, or swamp so as to constitute a source of water pollution. This includes debris and wastes that are generated at construction sites such as concrete truck washout, oils, gasoline, pesticides, litter, and sanitary wastes. No construction, development, or activity shall occur within the regulated area/setback of a wetland or watercourse unless approved by the New London Inland Wetlands Commission."

- 4.5 Item v – Incorporate Evaluation of Water Quality Impacts into Land Use Review. There are currently Zoning Regulations for Stormwater Drainage in parking areas (Section 614C. [20]) and Erosion and Sedimentation Controls (Section 800H. [14]). The regulations for parking areas address parking lots with 25 or more parking spaces and require the applicant to locate and describe all proposed BMPs for construction and postconstruction nonpoint source pollution control. Currently, all land use applications are reviewed by the City Planner and referred as necessary to the City Engineer's office for engineering review. Comment letters are issued for each application, and stormwater management elements are incorporated as conditions of approval if they are not adequately addressed in the application. The City is currently meeting this requirement, and no further action is needed.
- 4.6 Items vi and vii – Develop Procedure to Log Complaints and Take Follow Up Action. Any complaints regarding compliance with the Zoning Regulations and Planning and Zoning Commission approvals are currently received by the Zoning Office and a log of all complaints is tracked internally. A complaint form must be filed out and the formal complaints regarding violations of the Zoning Regulations (and violations of the requirements of Commission development review approvals) are track by the Zoning Enforcement Officer (ZEO). For the 2010 calendar year, the City received some very informal concerns expressed by neighbors about construction hours, which the ZEO resolved with phone calls, avoiding the need for any formal complaint to be filed.

Complaints regarding construction site management are typically received by the Public Works Department. Staff is dispatched to observe the site and determine the appropriate course of action. The City will develop a log for tracking these complaints and an inspection form for evaluating sites. A sample log is presented in Attachment D. This data will be maintained in the Public Works Department.

The City contracted with Milone & MacBroom, Inc. to assist in the preparation of a Stormwater Management Ordinance. This ordinance would require all development within the City limits to conform to the regulations set forth in the MS4 Permit, the 2004 Connecticut Stormwater Quality Manual, the 2000 Connecticut Department of Transportation Drainage Manual as well as the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control. A draft of that ordinance was submitted to the City and is currently under review.

Minimum Control Measure Number 5: Postconstruction Runoff Control

Specific permit requirements for this measure include:

- i. Develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre. This program should ensure that controls are implemented to require appropriate infiltration practices, reduce impervious surfaces, and reduce sediment discharge. This program should be enforceable by an ordinance or other mechanism.
- ii. Develop an ordinance or other mechanism to support the program developed under Item i.
- iii. Develop and implement strategies that include a combination of structural and nonstructural BMPs that are appropriate for the City.
- iv. Ensure adequate long-term maintenance and operation of stormwater BMPs that are installed.

The following BMPs are being implemented for this control measure:

- 5.1 Item i. Review Land Use Regulations to Meet Requirements of MS4 Permit and E&S Guidelines – The City contracted with Milone & MacBroom, Inc. to assist in the review of the current land use regulations. The regulations have been reviewed, and draft language is being developed. This language will be reviewed with City staff and, in 2011, if accepted, it will be incorporated into the regulations. A detailed discussion of these regulations is presented in Attachment D. Note that these are draft.

- 5.2 Item ii. Develop Postconstruction Ordinance or Regulation – Requirements for postconstruction stormwater quality management are currently addressed via conditions of approval which note requirements for the maintenance of stormwater water quality structures in accordance with the manufacturer's recommendations. In an effort to incorporate language into the Zoning and Subdivision Regulations of the City, the City contracted with Milone & MacBroom, Inc. to assist in the preparation of appropriate language to address this element. The modified language would require all development within the City limits to conform to the regulations set forth in the MS4 Permit, the 2004 Connecticut Stormwater Quality Manual, the 2000 Connecticut Department of Transportation Drainage Manual as well as the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control. A draft of that ordinance was submitted to the City and is currently under review.
- 5.3 Item iii. Develop and Implement Postconstruction BMP Strategy – The City currently addresses requirements for post construction requirements in all site plan reviews via conditions of approval. In 2011, the commission will evaluate that previously mentioned modification to the land use regulations to incorporate appropriate post construction stormwater BMPs. In addition, during preapplication meetings with potential applicants, city staff will continue to discuss the need for proper stormwater management and require that plans submitted be consistent with the Connecticut Stormwater Quality Manual.
- 5.4 Item iv. Develop Program to Ensure Long-Term Operation and Maintenance of BMPs – Contrary to many of Connecticut's more rural towns, the compact size and highly urbanized nature of New London has precluded the construction of many detention and retention basins that the City must now maintain. Therefore, BMP maintenance (assuming any exist) is the responsibility of the individual property. For new land use applications, a Stormwater Maintenance Plan is requested from the applicant to spell out the requirements of each element of a proposed system. It should also be noted that the City is a participant in a Stormwater Management Pilot Program where it is reviewing the feasibility of establishing a separate Stormwater Authority, which would use a fee-based system to fund all stormwater maintenance, improvements, and compliance activities. Upon finalization of the Stormwater Authority amendments, the City Counsel will discuss the next steps and submit a report to the legislature with their findings. In 2011, land use and engineering staff will evaluate incorporating the implementation of that plan into the condition of approval for each site.

The current land use regulations require a maintenance and operations manual for any stormwater control method used on sites with 25 or more parking spaces and require that, to the extent practicable, the owner is to maintain postdevelopment peak runoff rate and average volume of stormwater similar to the preconstruction rate. The owner is also to reduce the postdevelopment average annual Total Suspended Solid (TSS) loads by 80%. There are regulations currently in place regarding any parking lot within the City to have a stormwater management system that is designed and maintained to manage site runoff to prevent flooding, control peak discharges where required, and to maximize the retention and water quality on site. In addition to that, if any site discharges stormwater

within five hundred (500) feet of coastal waters, the stormwater management system shall be designed to retain and treat the volume of water generated by the first one (1) inch of rainfall on the site unless there is a demonstrated site constraint which would make that impossible. Approvals issued by the Planning and Zoning Commission require, where determined to be necessary, annual reporting to the City regarding compliance with the Zoning Regulations and the conditions of the Site Plan approval regarding long-term operation and maintenance of the stormwater drainage system and BMPs.

Minimum Control Measure Number 6: Good Housekeeping

- i. Develop and implement an operations and maintenance program that includes training for municipal employees and contractors and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.
- ii. The program described in item (i) above should 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.
- iii. Develop and implement a program to sweep all streets at least once per year as soon after snowmelt as possible and implement a program to evaluate and prioritize streets that may require sweeping more than once a year.
- iv. Develop and implement a program to evaluate and, if necessary, clean catch basins and other stormwater structures that accumulate sediment at least once per year, including a provision to identify and prioritize those structures that may require cleaning more than once per year.
- v. Develop and implement a program to evaluate and, if necessary, prioritize for repairing, retrofitting, or upgrading the stormwater conveyances, structures, and outfalls.

6.1 Items i and ii. Develop Training Program for Municipal Employees – While the City of New London does not have a formal training program in place for its employees, all employees do receive on-the-job training. The Division Manager of the Highway Maintenance Department is currently enrolled in the University of Connecticut Master Roads program and has committed to taking courses that are applicable to stormwater and roadway maintenance when they are available. In 2011, the City will evaluate ways to incorporate stormwater management practices into the activities of the Parks Department and facilities staff. This may include ensuring proper disposal of materials like waste oil, animal waste from the dog pound, and optimizing the use of fertilizers and pesticides.

- 6.2 Item iii. Sweep Streets at Least Once a Year as Soon as Possible after Snowmelt – All City streets are swept a minimum of once a year. There are localized areas of known issues that get swept more often.
- 6.3 Item iii. Evaluate Urbanized Areas for Possible Sweeping More than Once a Year – The downtown district of New London is swept two (2) times a week during the warm weather months.
- 6.4 Item iv. Develop Program to Evaluate and Clean Stormwater Structures at Least Once a Year – The City has a program in place to evaluate the structures and clean them on average once a year. There are localized areas within the City that get cleaned more often due to necessity. In 2010, the city acquired a refurbished drain cleaner, which is used on a daily basis, weather permitting. Records are being kept of all basins cleaned and it is the City's mission to clean every basin once a year.
- 6.5 Item v. Develop a Program to Evaluate and Prioritize System for Upgrades and/or Repair – There is a Capital Improvement Program for the City of New London that has prioritized the systems in need of upgrade or repair by the City. To date, the City has spent \$30,000 of their \$10M road bond issue on drainage system improvements and more are planned for 2011. At this time, evaluation and prioritization is based on correcting long-standing flood and stormwater management issues. During the Stormwater Pilot Program, Black & Veatch identified a list of major improvements that are needed. Hopefully, these will be addressed following the implementation of a Stormwater utility. In the meantime, they are considered during each capital budget cycle.

Due to the shortage of budget and personnel and personnel turn over, the City was not able to complete all items as listed in Minimum Control Measure Number 6 Good Housekeeping.

Monitoring

Sample six (6) outfalls once a year. Attachment E presents the monitoring reports for 2010.

List of Attachments

- A Public Notice Posted on City's Web Site
- B Public Education Brochure
- C Draft Illicit Discharge Ordinance
- D Suggested Construction Complaint Log
- E Suggested Land Use Regulation Modifications for Post Construction Stormwater Management
- F Stormwater Sampling Reports

Attachment A – Public Notice Posted on City’s Web Site

Notice of Public Review & Comment Storm Water Management Plan Annual Report

The City of New London through its City Manager has registered for the Annual CT DEP's General Permit for the Discharge of Stormwater form Small Municipal Storm Sewer Systems. As part of the requirements, the City of New London has prepared a Stormwater Management (SWMP) and an Annual Report. A draft copy of the Annual Report will be made available for public review for a 30-day period beginning on December 6, 2010 and ending on January 5, 2011. during the review period, copies of the draft Annual Report will be made available on the City website at <http://www.ci.new-london.ct.us/> and at **the Planning & Zoning Office located at the Stanton Building, 111 Union Street, new London, CT 06320 and at the Department of Public Works also located at 111 Union Street, new London, CT 06320 as well as the City of New London's, City Clerk's Office located at 181 State street, new London, CT 06320.** Written comments may be sent to Valerie Gambro, Public Works Administrative Manager, Department of Public Works, 111 Union Street, New London, CT 06320.

Attachment B – Public Education Brochure

A Guide to Healthy Habits for Cleaner Water

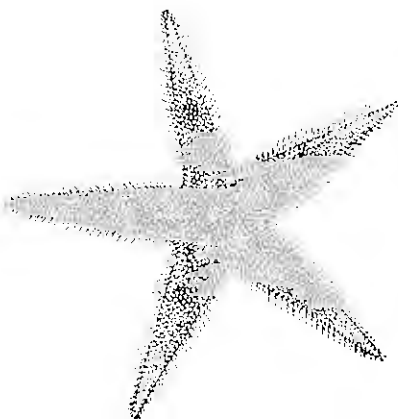


Pollution on our streets, parking lots and lawns is washed by rain into storm drains, then directly into our streams, rivers and the ocean. Fertilizer, oil, pesticides, detergents, pet waste, grass clippings: You name it and it ends up in our waterways.

Stormwater pollution is one of New London's greatest threats to clean and plentiful water, and that's why we're all doing something about it.

By sharing the responsibility and making small, easy changes in our daily lives, we can keep common pollutants out of stormwater. It all adds up to cleaner water, and it saves the high cost of clean up once it's dirty.

As part of New London's initiative to keep our water clean and plentiful and to meet federal requirements, many municipalities and other public agencies including colleges and military bases must adopt ordinances or other rules prohibiting various activities that contribute to stormwater pollution. Breaking these rules can result in fines or other penalties.



Contact information

City of New London
Department of Public Works
111 Union Street
New London, CT 06320
860-447-5250

For more information on stormwater related topics, visit:

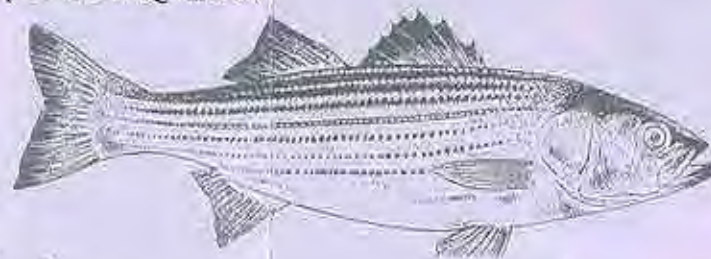
U. S. Environmental Protection Agency Web site:
www.epa.gov/npdes/stormwater or www.epa.gov/nps

State of Connecticut, DEP
Stormwater Quality Manual
<http://www.ct.gov/dep/cwp/view.asp?A=2721&Q=325704>



Every Day Solutions TO PROTECT OUR WATER FROM Stormwater Pollution

A Guide to Healthy Habits for Cleaner Water



Everything dumped on the street, on your lawn, driveway, or into a storm sewer gets into our water.

Properly Use And Dispose Of Hazardous Products



- Hazardous products include some household or commercial cleaning products, lawn and garden care products, motor oil, antifreeze, and paints.
- Do not pour any hazardous products down a storm drain because storm drains are usually connected to local waterbodies and the water is not treated. As a resident, business, or other member of the New London community, it is important to know these easy things you can do every day to protect our water.

Limit Your Use Of Fertilizers And Pesticides

- Do a soil test to see if you need a fertilizer.
 - Do not apply fertilizers if heavy rain is predicted.
 - Look into alternatives for pesticides.
 - Maintain a small lawn and keep the rest of your property or yard in a reasonable natural state with trees and other native vegetation that requires little or no fertilizer.
 - If you use fertilizers and pesticides, follow the instructions on the label on how to correctly apply it.
- If you have hazardous products in your home or workplace, make sure you store or dispose of them properly. Read the label for guidance.
 - Use natural or less toxic alternatives when possible.
 - Recycle used motor oil.
 - Contact The City of New London, Department of Public Works office at 860-447-5250 for the locations of hazardous-waste disposal facilities.



Keep Pollution Out Of Storm Drains

- New London has marked certain storm drain inlets with messages reminding people that storm drains are connected to local waterbodies.
- Do not let sewage or other wastes flow into a stormwater system. Do not litter.
- Place litter in trash receptacles.
- Recycle. Recycle. Recycle.
- Participate in community cleanups.

Dispose Of Yard Waste Properly



- Keep leaves and grass out of storm drains.
- Please follow the City's yard waste collection rules.
- Use leaves and grass clippings as a resource for compost. Do not rake leaves into storm drains or roadways.
- Use a mulching mower that recycles grass clippings into the lawn. Clean up after your pets.
- New London residents and visitors must abide by local pet-waste rules that require pet owners or their keepers to pick up and properly dispose of pet waste dropped on public or other people's property.
- Make sure you know New London's requirements and comply with them. It's the law.

Good Habits To Remember

- Use newspaper, bags or pooper-scoopers to pick up pet wastes.
- Dispose of the wrapped pet waste in the trash or unwrapped in a toilet.
- Never discard pet waste in a storm drain.
- Do not feed wildlife, such as ducks and geese, in public areas.

Attachment C – DRAFT Illicit Discharge Ordinance Language

Chapter 21 Water and Sewers

ARTICLE V. STORM SEWERS

DIVISION 1. GENERALLY

Sec. 21-161. Purpose.

The purpose of this article is to provide for the health, safety, and general welfare of the citizens of the City of New London through the regulation of non-storm water discharges to the storm drainage system to the maximum extent practicable as required by federal and state law. This article establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system (MS4) in order to comply with requirements of the National Pollutant Discharge Elimination System (NPDES) permit process. The objectives of this article are:

- (1) To regulate the contribution of pollutants to the municipal separate storm sewer system (MS4) by any user
- (2) To prohibit Illicit Connections and Discharges to the municipal separate storm sewer system
- (3) To establish legal authority to carry out all inspection, surveillance and monitoring procedures necessary to ensure compliance with this ordinance.

Sec. 21-162. Scope; applicability.

This article shall apply to all water entering the storm drain system generated on any developed and undeveloped lands unless explicitly exempted by an authorized enforcement agency.

Sec. 21-163. Definitions.

For the purposes of this article, the following terms shall have the meanings ascribed to them in this section:

Authorized Enforcement Agency shall mean employees or designees of the director of Public Works.

Best Management Practices (BMPs) shall mean those practices which reduce pollution and have been determined by the Connecticut Department of Environmental Protection to be acceptable.

City, or any other word in common usage designating a legally constituted unit of local government, shall mean the City, Connecticut.

Clean Water Act shall mean the federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.) and any subsequent amendments thereto.

Hazardous Materials shall mean any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Illicit Discharge shall mean any unpermitted discharge to waters for the state that does not consist entirely of stormwater or uncontaminated groundwater, except those discharges that are specifically authorized by the Connecticut Department of Environmental Protection and have been determined to not be significant contributors of pollution.

Illicit Connections shall mean any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the storm drain system including but not limited to any conveyances which allow any non-storm water discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor rains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency or any drain or conveyance connected from a commercial or industrial land use to the storm drain system which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency.

Industrial Activity shall mean activities subject to NPDES Industrial Permits as defined in 40 CFR, Section 122.26(b)(14).

Non-Storm Water Discharge shall mean any discharge to the storm drain system that is not composed entirely of storm water or uncontaminated groundwater.

NPDES shall mean the National Pollutant Discharge Elimination System permit program, whether federally or state administered.

Occupant shall mean the person having actual day-to-day occupancy and control of real property, whether owner or not.

Owner shall mean the titleholder of real property.

Person shall mean any individual, association, organization, partnership, firm, corporation, or entity recognized by law and acting as either the owner or as the owner's agent.

Pollutant shall mean anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordinances, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

Premises shall mean any building, lot, parcel of land, or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.

Storm Drainage System shall mean publicly-owned facilities by which storm water is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.

Storm Water shall mean any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.

Superintendent shall mean the person appointed by the executive director to exercise direct administrative and operational control of the functioning of the various aspects of the storm drainage systems. The superintendent of highways shall be responsible for the storm drainage system.

Wastewater shall mean any water or other liquid, other than uncontaminated storm water, discharged from a facility.

Sec. 21-164. Responsibility for administration and enforcement.

The executive director shall administer, implement, and enforce the provisions of this article. Any powers granted or duties imposed upon the executive director may be delegated in writing by the executive director to persons or entities acting in the beneficial interest of or in the employ of the agency.

Sec. 21-165. Right of entry for enforcement purposes.

(a) *Applicability.* This section applies to all facilities that have storm water discharges, including construction activity.

(b) *Access to Facilities.* The executive director, his deputy and any other duly authorized employee, hereinafter severally or collectively referred to as "executive director" as used in this article, [when] bearing proper credentials and identification shall be permitted to enter all properties for the purposes of inspection, observation, measurement, sampling, and testing in accordance with the provisions of this article.

(c) *Inspection.* The executive director shall be permitted to access all parts of the premises for the purposes of inspection, sampling, examination and copying of records, and the performance of any additional duties as defined by state and federal law.

(d) The executive director shall be permitted to set up such devices as are necessary in the opinion of the authorized enforcement agency to conduct monitoring and/or sampling of the facility's storm water discharge.

(e) The executive director has the right to require the discharger to install monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and property operating conditions by the discharger at its own expense. All devices used to measure stormwater flow and quality shall be calibrated to ensure their accuracy.

(f) *Observance of applicable safety rules.* While performing the necessary work on private properties referred to in subsections (b) and (c) of this section, the executive director shall observe all safety rules established by the owner or occupant of the property and applicable to the premises.

(g) *Liability for injury or damage.* During the performance on private properties of inspections, stormwater sampling, or other similar operations referred to in subsection (b) and (c) of this section, the owner and occupant shall be:

- (1) Held harmless for personal injury or death of the executive director and the loss of or damage to city supplies or equipment;
- (2) Indemnified against loss of or damage to property of the owner or occupant by the executive director; and
- (3) Indemnified against liability claims asserted against the owner or occupant for personal injury or death of the executive director or for loss of or damage to property of the city except as such may be caused by negligence or failure of the owner or occupant to maintain safe conditions as required by Article III, section 21-101 et seq..

(h) Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the operator at the written or oral request of the executive director and shall not be replaced. The costs of clearing such access shall be borne by the operator.

(i) Unreasonable delays in allowing the executive director access to a facility is a violation of a storm water discharge permit and of this article.

(j) If the executive director has been refused access to any part of the premises from which stormwater is discharged, and he/she is able to demonstrate probable cause to believe that there may be a violation of this article, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this article or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the authorized enforcement agency may seek issuance of a search warrant from any court of competent jurisdiction.

Sec. 21-166. Notice of violation--Service; duty to comply.

Any person found to be violating any provision of this article shall be served by the authority with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof. Such notice may require without limitation:

- (1) The performance of monitoring, analyses, and reporting;

- (2) The elimination of illicit connections or discharges;
- (3) That violating discharge, practices, or operations shall cease and desist;
- (4) The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property; and
- (5) Payment of a fine to cover administrative and remediation costs in accordance with the maximum penalties authorized by state Statute; and
- (6) The implementation of source control or treatment BMPs.

The offender shall, within the period of time stated in such notice, permanently cease all violations.

Sec. 21-167. Same--Noncompliance deemed violation; penalties.

Any person who shall continue any violation beyond the time limit provided for in section 21-166 shall be further advised that the work will be done by a designated governmental agency or a contractor and the expense thereof shall be charged to the violator.

Sec. 21-168. Same—Appeal of Notice of Violation.

Any person receiving a Notice of Violation may appeal the determination of the authorized enforcement agency. The notice of appeal must be received within 5 days from the date of the Notice of Violation. Hearing on the appeal before the appropriate authority or his/her designee shall take place within 15 days from the date of receipt of the notice of appeal. The decision of the municipal authority or their designee shall be final.

Sec. 21-169. Same--- Enforcement Measures after Appeal.

If the violation has not been corrected pursuant to the requirements set forth in the Notice of Violation, or in the event of an appeal, within 30 days of the decision of the municipal authority upholding the decision of the authorized enforcement agency, then representatives of the authorized enforcement agency shall enter upon the subject private property and area authorized to take any and all measures necessary to abate the violation and/or restore the property. It shall be unlawful for any person, owner, agent or person in possession of any premises to refuse to allow the government agency or designated contractor to enter upon the premises for the purposes set forth above.

Sec. 21-170. Same --- Cost of Abatement of the Violation.

Within 30 days after abatement of the violation, the owner of the property will be notified of the cost of abatement, including administrative costs. The property owner may file a written protest objecting to the amount of the assessment within 7 days. If the amount due is not paid within a timely manner as determined by the decision of the municipal authority or by the expiration of

the time in which to file an appeal, the charges shall become a special assessment against the property and shall constitute a lien on the property for the amount of the assessment. Any person violating any of the provisions of this article shall become liable to the city by reason of such violation. The liability shall be paid in not more than 12 equal payments.

Sec. 21-171. Same --- Injunctive Relief.

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this article. If a person has violated or continues to violate the provisions of this ordinance, the authorized enforcement agency may petition for a preliminary or permanent injunction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

Sec. 21-172. Same – Compensatory Actions.

In lieu of enforcement proceedings, penalties, and remedies authorized by this article, the authorized enforcement agency may impose upon a violator alternative compensatory actions, such as storm drain stenciling, attendance at compliance workshops, creek cleanup, etc.

Sec. 21-173. Same – Violations Deemed a Public Nuisance.

In addition to the enforcement processes and penalties provided, any condition cause or permitted to exist in violation of any of the provisions of this article is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken.

Sec 21-174. Same – Criminal Prosecution.

Any person that has violated or continues to violate this article shall be liable to criminal prosecution to the fullest extent of the law, and shall be subject to a criminal penalty of based on the maximum amount allowable by state statute per violation per day. The authorized enforcement agency may recover all attorney's fees court costs and other expenses associated with enforcement of this article, including sampling and monitoring expenses.

Sec 21-175. Same – Remedies Not Exclusive.

The remedies listed in this article are not exclusive to any other remedies available under any applicable federal, state or local law and it is within the discretion of the authorized enforcement agency to seek cumulative remedies.

Sec 21-176. Adoption of Article.

This article shall be in full force and effect __ days after its final passage and adoption. All prior articles and parts of articles in conflict with this article are hereby repealed.

DIVISION 2. DISCHARGE REGULATIONS

Subdivision I. General Provisions

Sec. 21-171. Discharging Harmful Substances.

(a) *Restricted.* No person shall discharge or cause to be discharged into the municipal storm drain system or watercourses any materials, including but not limited to pollutants or waters containing any pollutant that cause or contribute to a violation of applicable water quality standards, other than storm water or uncontaminated groundwater.

(b) *Accidental discharges.* Should any such illegal discharges or pollutants be accidentally introduced into storm water, the municipal storm drain system, or water of the U.S., any person responsible for a facility or operation, or responsible for emergency response for a facility or operation shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials, said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of non-hazardous materials, said person shall notify the executive director in person or by phone or facsimile no later than the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to the executive director within three business days of the phone notice. Notification shall not be delayed for the purpose of obtaining more specific or amplifying information. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain on-site written records of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

Sec. 21-172. Modification of discharge restrictions.

(a) *Exempt Discharges.* The following discharges are exempt from discharge prohibitions established by this article: water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, non-commercial washing of vehicles, natural riparian habitat or wetland flows, swimming pools (if dechlorinated-typically less than one PPM chlorine), fire fighting activities, and any other water source not containing Pollutants; discharges specified in writing by the authorized enforcement agency as being necessary to protect public health and safety.

(b) Dye testing is an allowable discharge, but requires a verbal notification to the authorized enforcement agency prior to the time of the test.

(c) The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws

and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

(d) *Enforcement.* The executive director shall have the power to immediately stop and prevent the discharge of materials as specified in subsection (a) of this section whenever they shall determine that the public interest shall demand it.

Sec. 21-173. Prohibition of Illicit Connections.

(1) The construction, use, maintenance, or continued existence of illicit connection to the storm drain system is prohibited.

(2) This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

(3) A person is considered to be in violation of this ordinance if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.

Sec. 21-174. Watercourse Protection.

Every person owning property through which a watercourse passes, or such person's lessee, shall keep and maintain that part of the watercourse within the property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse. In addition, the owner or lessee shall maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

Sec. 21-175. Requirements to Prevent, Control and Reduce Storm Water Pollutants by the Use of Best Management.

The owner or operator of a commercial or industrial establishment shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the municipal storm drain system or watercourse through the use of structural and non-structural BMPs. Further, any person responsible for a property or premise, which is, or may be, the source of an illicit discharge, may be required to implement, at said person's expense, additional structural and non-structural BMPs to prevent the further discharge of pollutants to the municipal separate storm sewer system. Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of storm water associated with industrial activity, the extent practicable, shall be deemed compliance with the provisions of this section. These BMPs shall be part of a stormwater pollution prevention plan (SWPP) as necessary for compliance with requirements of the NPDES permit.

Sec. 21-176. Industrial or Construction Activity Discharges.

Any person subject to an industrial or construction activity NPDES storm water discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the executive director prior to the allowing of discharges to the MS4.

Section 21-177. Same – Suspension of MS4 Access

(a) *Suspension due to Illicit Discharges in Emergency Situations.* The executive director may, without prior notice, suspend MS4 discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent and substantial danger to the environment, or to the health or welfare of person, or to the MS4 or Waters of the United States. If the violator fails to comply with a suspension order issued in an emergency, the authorized enforcement agency may take such steps as deemed necessary to prevent or minimize damage to the MS4 of Waters of the United States, or to minimize danger to persons.

(b) *Suspension due to the Detection of Illicit Discharge.* Any person discharging to the MS4 in violation of this article may have their MS4 access terminated if such termination would abate or reduce an illicit discharge. The authorized enforcement agency will notify a violator of the proposed termination of its MS4 access. The violator may petition the authorized enforcement agency for a reconsideration and hearing. A person commits an offense if the person reinstates MS4 access to premises terminated pursuant to this Section, without the prior approval of the authorized enforcement agency.

Attachment E - Suggested Land Use Regulation Modifications for Post Construction Stormwater Management

The following review has been divided according to the regulatory issues. For each regulation identified, we have provided potential text changes.

1.0 SUBDIVISION REGULATIONS REVIEW

1.1 Impervious Surfaces Management

1.1.1 Sidewalks

Sidewalks increase the impervious coverage. On Page 14 of 24 a diagram labeled Section 530.2 depicts the required dimensions of roadway and sidewalk within a right of way. It specifies a road width of 34 feet with a 6" curb, 1 ½ ft of grass and 5 feet of sidewalk. This effectively prohibits the use of innovative stormwater management techniques to serve as infiltration systems or biofilters for stormwater runoff and should be revised to include the following note:

"The commission may authorize variation of this requirement in order to preserve substantial existing trees or other valuable site resources or to provide for alternative stormwater management methods."

This diagram also implies that sidewalks on both sides of the street are required in all instances. It should be revised to specify that:

"Sidewalks shall be required on both sides of streets in subdivisions in all residential zones. For dead-end streets or those serving less than 10 residences, sidewalks on one side shall be allowed with approval from the commission."

1.1.2 Driveways

There are currently no specifications pertaining to driveway design in the Subdivision Regulations. Section 540 could be amended to include options that promote LID:

"The minimum driveway width shall be no less than ten (10) feet and no greater than twelve (12) feet unless authorized by the commission."

It could also be amended to include general design requirements:

"All off street parking areas and driveways shall be designed, to include drainage design, and constructed to the standards of the Director of Public Works. The Commission may allow an alternate surface to be used for the parking area when such surface is designed to minimize storm water runoff. In such situations, a maintenance plan for the surface must be approved by the Commission."

1.1.3 Roadways

The right-of-way diagram in Section 530.2 appears to require a pavement width of 34 feet regardless of the road classification. In smaller subdivisions that hold no potential for future development, this roadway width may be excessive. For instance, where roadways will serve less than 10 lots, a paved width of 22 feet would be more than adequate as long as off-street parking is provided. We suggest incorporating a sliding scale based on the number of lots to be served. For example:

"Local Residential Streets and Private Street:

Serving <10 lots: 22 feet
Serving 11-30 lots: 24 feet
Serving 30+ lots: 26 feet."

This section may also be revised to indicate that:

"The commission retains the right to increase required width of pavement should they deem it necessary."

Alternatively, language could be added giving the commission the authority to determine roadway width on a case-by-case basis:

"Pavement travel width for new residential streets shall be 18 to 24 feet. The commission will review proposed traffic counts, road curvature, sight lines, and other considerations in determining the appropriate roadway width on a case-by-case basis. Alternative porous pavement substitutes may be implemented if approved by the commission."

Section 530 should be amended to include text that encourages LID. The following items should be added:

"Curbing is not required unless specifically requested by the commission, in which case curbing shall be 6" bituminous or "cape-cod" style or slope granite curbing. Curbing installation shall be determined as follows:

- a. When individual lot development occurs within a developed residential street, the type of curb required should be consistent with the predominant material currently existing on that street as determined by the commission.
- b. When existing roadways and sidewalks are reconstructed on local residential streets, curbs should be replaced with the predominant curb type that currently exists within the neighborhood as determined by the commission.
- c. On rural roads, the determination whether to install granite curbs or alternate materials will be based upon such factors as the street grade, stormwater management considerations, natural features, and topography."

1.1.4 Roofs

Section 540 Other Improvements could be amended to include the following paragraph:

"When feasible and appropriate, roof runoff should be directed into infiltration systems sized to contain the water quality volume associated with the impervious roof area as described in the 2004 Connecticut Stormwater Quality Manual or onto stable vegetated soils for at least 50 feet to encourage infiltration and ground water recharge. Excess roof runoff may be directed overland or to watercourses or storm drains via grass swales or perforated pipes."

1.2 Landscaping

Subdivision Regulations do not specify any required landscaping for subdivision applications above and beyond street tree planting. We recommend incorporating landscaping requirements for subdivision applications to address excessive grading, encourage the use of vegetative buffers, encourage the replacement of specimen trees, enforce limits of clearing, and encourage the retention of natural resources. Example text follows:

- "(1) Landscaping shall be provided as part of subdivision design along streets, at subdivision entrances and within open space, and other areas if appropriate. It shall be conceived in a total pattern or theme throughout the site, integrating the various elements of site design, preserving and enhancing the particular identity of the site, and creating a pleasing site character.
- (2) A landscape plan prepared by a registered landscape architect shall be submitted with each subdivision application which contains five (5) or more lots and/or new road(s). The plan shall identify the existing mature trees and proposed trees, shrubs, and ground covers; natural features such as rock outcroppings; and other landscaping elements. The plan shall show where they are or will be located and planting and/or construction details. Where existing plantings are to be retained, the applicant shall include in the plans proposed methods of protecting them during construction.
- (3) The natural features of the site shall be preserved to the fullest extent, and the felling of trees shall be held to a minimum. Plans must show all trees of 12" caliper or greater measured at 4'6" from the ground within any existing City right-of-way abutting the subdivision. Any tree removed in this area must be approved by the City's tree warden.
- (4) A waiver to this provision may be granted by the commission where it is demonstrated that subdivision landscaping is not practical or feasible, or where existing site vegetation to be preserved is sufficient to preclude the need for

additional landscaping. If a waiver is granted, the subdivision plan must contain provisions for preservation of existing vegetation (where appropriate).

- (5) Additional landscaping: In residential subdivisions, besides the screening and street trees required, additional plantings or landscaping elements may be required throughout the subdivision where necessary for privacy or other reasons in accordance with the landscape plan approved by the commission. In nonresidential subdivisions, all disturbed areas of the site not occupied by buildings and other impervious surfaces shall be landscaped by the planting of grass or other ground cover, shrubs, and trees as part of the landscape plan approved by the commission.
- (6) Planting specifications: Deciduous trees shall have at least a 3 inch caliper at planting. Size of evergreens and shrubs shall be allowed to vary depending on the setting and type of tree/shrub. All plant materials shall be of nursery stock quality, and all trees, shrubs, and ground covers shall be planted according to accepted horticultural standards. Dead and dying plants shall be replaced by the developer during the following planting season."

1.3 Tree Regulations

Section 530.14 could be revised to specify the type of tree required or mature height. In addition, revising the required location of these proposed trees will allow for more leeway in the potential design of low impact stormwater management systems such as drainage swales:

"The Commission may require the planting of trees, of an approved species, of not less than two 2 ½ inch caliper with a minimum height of twelve (12) feet, not more than 50 feet apart on both sides of all streets, along the fronts of the lots, not less than five feet from the street line and shall be located within the street right-of-way, or as otherwise approved by the Commission. They shall have a mature height of 35 feet or greater. The commission may allow deciduous trees with a mature height of less than 35 feet in areas where overhead utility lines or solar energy is of concern. Existing specimen shade trees shall be left in place where practicable. The developer shall leave not less than two naturally growing trees having 3-inch caliper in the front yard of each lot or shall plant one tree for every 50 feet of lot frontage or fraction thereof, but no less than two trees with 3-inch caliper in the front yard of each lot. These shall be located a minimum of 5 feet from the street line to a maximum of 30 feet from the street line. Straight rows and the use of only one variety are to be avoided, the intent being to create a natural mixture of appropriate species."

1.4 Stormwater Management

Section 540.2 requires that an adequate system of storm water drainage be provided and "no natural watercourse shall be altered or obstructed in such a way as to reduce the

natural runoff capacity unless substitute means of runoff are provided." It also specifies that developers provide "additional capacity in adjacent culverts and other drainage features for accommodating increased runoff from the proposed development should it be deemed necessary by the Commission." There are no detailed regulations for stormwater management plans and drainage design. The following is suggested text that may be an appropriate addition to Section IV of the Regulations:

"A Stormwater Management Plan (the Plan) is required for all subdivision and site plan applications except when the City Engineer or his designee grants a waiver in writing in accordance with Article VI of the Regulations. Such waiver will only be granted if the applicant demonstrates that the stormwater goals and objectives have been met. The Plan shall consist of information and reports showing the method for managing both stormwater quantity and quality. The plan shall provide, at a minimum, the following information:

1. Soil characteristics of the site.
2. Location of the closest surface water bodies and wetlands to the site, and the depth to any groundwater or aquifer areas on or adjacent to the site. In the case of tidal waters, provide the mean high water and high tide elevations.
3. DEP ground and surface water quality classification of water bodies on and adjacent to the site.
4. Identification of any water bodies on and adjacent to the site documented by DEP as not meeting water quality standards.
5. Location and description of all proposed stormwater control BMPs for both construction activities and post-construction long-term stormwater control.
6. Proposed maintenance and operation manual or schedule for any trash hoods, catch basins, or other BMP devices used to prevent runoff, encourage sheet flow or infiltration, or treat stormwater.

The following language would be appropriate for Section V, Design Standards:

All stormwater management systems in new developments shall be designed, constructed, and maintained with BMPs to minimize runoff volumes, prevent flooding, reduce soil erosion, protect water quality, maintain or improve wildlife habitat, and contribute to the aesthetic values of the project.

- A. Stormwater management system designs shall meet the following general standards:
 1. Provide water quality measures and pursue Low Impact Development techniques in accordance with the 2004 Connecticut Stormwater Quality Manual, as amended. This includes retaining the first inch of runoff on-site when discharging to tidal wetlands;
 2. Provide stormwater conveyance systems designed in accordance with the 2000 Connecticut Department of Transportation Drainage Manual, as amended,

- including requirements of analysis of hydraulic grade line as well as system capacity;
3. Be designed in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control;
 4. Be signed and sealed by a licensed professional engineer;
 5. Be based on environmentally sound site planning and engineering techniques;
 6. Include an Operations and Maintenance Plan in accordance with the most recent version of The Connecticut Stormwater Quality Manual (CTDEP). All stormwater BMPs shall be designed in a manner to minimize the need for maintenance and reduce the chances of failure;
 7. Maintain, where feasible, the natural environment of City streams and drainage systems by preventing pollutants from storm runoff from entering the systems and, where feasible, restoring the floodplain to its natural functional purpose;
 8. Encourage innovative design solutions to control the quality of storm runoff from development during and after construction. Natural landscape solutions such as minimization of impervious surfaces, undisturbed buffers, and filter strips are preferred over structural solutions such as detention ponds; and
 9. Encourage the construction of joint detention ponds serving several properties.
- B. All stormwater detention outlet structures shall be designed to control the post-development peak discharge rates from 10-, 25-, and 100-year storms to the corresponding predevelopment peak discharge rates unless it can be demonstrated that there will be no deleterious downstream effects from an increase in stormwater discharge. Generally, detention in the upper part of a watershed will be required. The City Engineer shall determine if detention in the lower third of the watershed is necessary based on a watershed study to be performed by the design engineer.

Post development runoff volumes shall match pre-development rates wherever possible. Potential impacts to receiving water bodies must be assessed and mitigated. The applicant's engineer shall provide such information as the City Engineer deems necessary to determine the effect of the development on the existing downstream drainage facilities outside of the area of the development. Downstream drainage improvements may be required where the City Engineer anticipates that the additional runoff rate or volume resulting from the development may overload an existing downstream drainage facility.

- C. A complete runoff hydrograph evaluation is required for all projects with the potential to increase runoff rates as determined by the City Engineer or his designee. Hydrograph evaluations shall be conducted for existing and anticipated land use conditions for storms with average return frequencies of 2, 10, 25, 50, and 100 years and shall consider the full watershed discharging to the site, including upland areas in their existing condition. Hydrologic evaluations shall be completed using NRCS or USACE methods using the following 24-hour rainfall amounts with a Type III distribution:

Storm Frequency (Year Storm)	Inches of Rainfall
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2	3.4
5	4.4
10	5.2
25	6.4
50	7.8
100	9.2

*These values are based on the 1997 study by the Department of Natural Resources Management and Engineering, University of Connecticut, documenting 100 years of rainfall data up through August 1996.

Project reports shall include all relevant information associated with the hydrologic evaluation, including watershed mapping, runoff curve number calculations and time of concentration calculations for both existing and proposed conditions. Calculations of stormwater runoff rates, suspended solids removal rates, and soil infiltration rates before and after completion of the activity proposed in the application shall be included. Model input and output data shall be provided in the report. Results of the analysis shall be summarized in a table form for each subwatershed as well as the overall site and shall document discharges at pre-development conditions, post development conditions without attenuation and post development with attenuation.

D. The following design frequencies shall be used for the different storm water facilities:

Cross culverts at public roadway crossing: 100 Year Storm
Storm Drainage Conveyance Systems: 10 Year Storm
Grassed Swales: 10 Year Storm with maximum velocity of 2.5 feet/second

The site plan shall include the location, top of frame elevations, invert elevations, pipe sizes and other similar information as may be required by the commission, City engineering staff, or the commission's consulting engineering staff to properly evaluate the stormwater management plan for the site. Flow calculations shall be provided for all pipe runs and cross culverts.

E. Infiltration of stormwater shall be accommodated to the extent possible through nonstructural approaches such as limitation of land disturbance and grade changes, preservation of natural drainage patterns, retention of existing wetlands, and creation of vegetated islands, vegetated medians, and vegetated perimeter buffer strips. On sites where little traffic is anticipated, the commission may approve the use of pervious surface materials for all or part of a parking area when such paving is part of an overall drainage design which minimizes concentration of stormwater runoff. Where feasible, roof runoff shall be collected and reintroduced to the ground water table via infiltration devices where soils and water table depths may permit. Infiltration rates shall be reduced by a safety factor of two to account for clogging over time.

- F. For sites where low impact development methods are being used to provide for stormwater management, the post construction analysis can reflect this through modification of runoff curve numbers and times of concentration.
- G. Where a development's storm drainage system is proposed to discharge into a City storm drainage system, the developer shall make provisions to accommodate anticipated additional discharge in the event the City system is not adequate. Necessary improvements to the City system to accommodate the additional stormwater discharge shall be done at the expense of the developer.
- H. Provisions shall be made for all private stormwater drains such as footing drains and yard drains. Where possible, the discharge from footing and roof drains shall be directed away from the City's piped drainage system, but where such discharges must occur, the size and location of all private drains that are connected to the public stormwater drainage system shall be shown.
- I. Direct discharge of untreated stormwater to any natural wetland or water body is prohibited. Stormwater runoff discharged to wetlands must be diffused to non-erosive velocities prior to reaching any natural wetland based on calculations submitted with the application package.
- J. The commission may send any or all information provided on anticipated stormwater flow patterns and volumes and proposed stormwater management systems to the City Engineer and/or other consulting professional or agency for review and advisory comment."

1.5 Erosion and Sedimentation Control

Section 440 specifies the requirements of sediment and erosion control plans for subdivision plans and references the "Connecticut Guidelines for Soil Erosion and Sediment Control" by the National Resource Center of the Connecticut Department of Environmental Protection. The City may want to consider incorporating additional language into the specifications for the Erosion and Sediment Control Plan, such as:

"The smallest practical area of land should be exposed at any one time during development. When land is exposed during development, the exposure should be kept to the shortest practical period of time. Land should not be left exposed during the winter months. Where necessary, temporary vegetation and/or mulching and structural measures may be required by the Zoning Enforcement Officer to protect areas exposed during the development. Sediment basins (debris basins, desilting basins, settling basins, or silt traps) shall be installed and maintained during development to remove sediment from runoff water and from land undergoing development. The 2002 Connecticut Guidelines for Soil Erosion and Sediment Control as amended (CT DEP) shall be followed. City of New London Standard Details shall be incorporated into the sediment and erosion control plan."

2.0 ZONING REGULATIONS REVIEW

2.1 Lot Imperviousness

There are no specifications in the regulations regarding minimum buildable area. We suggest that this be defined in Section 210:

"No wetlands, watercourses, or water bodies shall be present within the Minimum Buildable Area. Minimum Buildable Area shall contain no naturally occurring or postdevelopment slopes in excess of 20 percent; no inland wetlands soils; no land within the areas of special flood hazard as identified by the Federal Emergency Management Agency; no utility or access easements and rights-of-way; and no conservation easements or other easements for public or private facilities."

2.1.1 Parking

Section 400.3.12.m defines the requirements for an Age-Restricted Housing development. This section specifies that "Parking areas and driveway shall have a permanent all-weather surface and shall be properly drained."

Article VI, Section 614 specifies requirements for off-street parking. Item C.12 specifies that the parking areas be paved, but allows the Commission to permit an alternate surface treatment if the use is a low traffic generator or if the design is part of a storm water management plan to minimize storm water impacts.

In addition, the City may want to consider requiring additional measures to more specifically reduce the amount of impervious surfaces in all proposed parking lots (taken from the East Haddam regulations):

"In all districts, off-street parking provided and maintained as paved/impervious surface shall be counted as part of the Lot Impervious Surface Coverage. Parking areas composed of pervious surfaces are encouraged for all land uses and lots, unless there are overriding environmental limitations, and may be provided to meet all or part of any required parking spaces on a lot. Measures that shall be considered to reduce the amount of impervious surfaces in all proposed parking lots include:

1. Provide pervious parking stall surfaces
2. Provide pervious overflow parking
3. Provide pervious snow storage space
4. Conserve existing natural areas, including trees on site
5. Minimize clearing to the extent practicable while retaining access, sight distance, and safe vehicle flows"

Section E details waivers and reductions of the number of required parking spaces based on demonstration by the applicant that a lesser number of parking spaces will suffice. The following text would allow for a reduction based on stormwater design such as:

"A reduction in parking spaces may be allowed when the Planning and Zoning Commission deems the reduction to be in the best interest of the City, should the increase in stormwater runoff rate shall be held to a minimum by reducing the number of parking spaces."

2.1.2 Roofs

Regulations do not currently specify any requirements for roof leader discharge, whether via surface runoff or infiltration. The addition of such language to promote infiltration of that runoff or at least separation of that "clean" water from roadway and parking lot runoff would be appropriate. Section 614.C.20 specifies the general requirements for Site Plan stormwater management. This section can be revised to require that roof runoff shall be collected and reintroduced to the ground water table via infiltration devices where soils and water table depths may permit.

2.2 Landscaping

Section 603 details landscaping requirements and buffers for multi-family and nonresidential properties. Section 614.C.13 specifies landscaping and screening requirements for Site Plans and Special Permit applications. Both sections could be revised to specify that all submitted landscape plans be designed and signed by a certified landscape architect. A statement could also be added which notes:

"j) The use of depressed interior landscape islands for use as biofiltration areas (rain gardens) is encouraged."

Item 614.C.13.g addresses the preservation of natural vegetation. This requirement could be expanded as follows:

"Large trees and stands of mature trees and shrubs are to remain undisturbed where practical and desirable. Existing healthy trees of 18 inch caliper and greater (to be survey located either singly or as groups) shall be incorporated into the site plan to the maximum extent possible. Similarly, significant stands (10 or more trees) of related species, or consistent scrub-shrub groupings occurring in front, side, or rear yards shall be preserved whenever feasible. When possible, existing trees shall be saved by appropriate welling and mounding. All trees and shrubs to remain undisturbed shall be tagged or otherwise identified in the field prior to commencement of site work and shall be shown on the landscaping plan."

Section 603 details the requirements for buffers which include a landscape strip at least three feet wide along all property lines of multi-family developments in any zone and nonresidential uses within or adjoining residential zones. The section defines the required plantings and maintenance. This required dimension seems very small, even given the urban nature of the city. The following language could be substituted:

A. Purpose

The purpose of this regulation is to provide minimum standards for landscaping and buffer zones in order to reduce the negative impacts between incompatible land uses; ameliorate the blighted appearance of parking areas; conserve and stabilize property values; and otherwise insure the creation of an attractive and harmonious environment. To the extent practical, landscape areas shall serve multiple benefits for a site, including aesthetic, visual mitigation, and stormwater management.

B. Standards and Design

1. For the purposes of this section, a site may mean an entire lot or, when a parcel is to be developed in phases, a portion of the lot that bears a reasonable relation to the building(s) for which a site plan has been approved.
2. Wherever any nonresidential use/zone abuts any residential zone, a buffer shall be required. The buffer shall meet the following criteria:
 - a. The field of view between abutting residential and nonresidential uses/zones shall be obscured visually within 5 years time to such an extent that activity on the abutting lot is not immediately apparent; and
 - b. The field of view between abutting residential and nonresidential uses/zones shall be substantially obscured visually by the maturity of the planting.
3. Wherever any nonresidential zone abuts any residential zone, a buffer is required on both sides of the shared zone boundary line. Applicants are responsible for providing the required buffer on their side of the zone boundary. Buffers are not required along street frontages; however, the commission may require screening. Buffers are not required between two abutting nonresidential uses in residential zones.
4. All uses subject to a Special Permit from the Zoning Commission shall require a buffer along all property boundaries except street frontage. Buffers shall be subject to the following consideration:
 - a. When two of these special permit uses are adjoining, the field of view between the two uses shall be substantially reduced but not necessarily obscured, both within 5 years time and at maturity.
5. All buffer areas shall be designed by a licensed landscape architect.
6. Clear cutting/harvesting of trees within a buffer area is expressly prohibited at any time without prior commission approval.

7. The commission may modify proposed landscaping plans to require more mature plantings, different species, or alternative design in order to afford a functional and aesthetically pleasing buffer area.

C. Buffer Widths

Zone/Use	Buffer Width
Age Restricted Housing Development	10 feet
NB, C-1, C-2, CBD, WD, WC-1, MD, LI-O, INST, OS	10 feet
Nonresidential Uses in Residential Zones	10 feet

1. The length of the buffer to be planted prior to issuance of the first C.O. will be so indicated on the site plan of development for industrial/commercial and high-density residential developments; and on the individual plot plan for single-family residential development.
2. The commission strongly recommends that developers begin installing the entire buffer on a parcel well in advance of planned building activities for the balance of the parcel, as smaller plantings can be utilized. The buffer may then exceed the required specifications at the time a Certificate of Occupancy (CO) is requested.

D. Interplanted Buffer

Areas to remain undisturbed during construction activities (i.e., nonencroachment areas) shall be indicated on the landscaping plan. If filling, cutting, grading, or other disruptive activities occur near nonencroachment areas, trees and shrubs to be preserved shall be protected in accordance with accepted landscaping practices. The methods proposed to afford such protection shall be identified on the landscaping plan or in a corresponding document. The interplanted buffer shall be designed using accepted landscape and horticultural practices to meet or exceed the performance level described herein. In addition, the following guidelines shall be followed:

1. Evergreen trees and large deciduous trees should be spaced generally 20 to 30 feet on center;
2. Flowering trees should be spaced generally 10 to 20 feet on center; and
3. Trees shall not be planted within 20 feet of a sewer line or area of heavy equipment use.
4. When the required buffer abuts an undeveloped Residential and/or Nonresidential Zone, the taller and/or larger varieties of trees and shrubs (at maturity) shall be

established adjacent to the zone line. When the buffer area abuts a developed Residential zone, the taller and larger varieties of trees and shrubs (at maturity) shall be established adjacent to the Nonresidential use within the buffer area.

5. Plantings shall be staggered/clustered to achieve maximum screening after 5 years and at maturity. Evergreen trees shall be a minimum of 5 feet in height at the time of plantings; deciduous shade trees shall be a minimum of 2" caliper and 10 feet planting; and flowering trees shall be a minimum of 6 feet in height at the time of planting and 1½" caliper.

E. Non-interplanted Buffer

When mature existing vegetation is not being incorporated into the buffer plantings or when such vegetation comprises a relatively insignificant proportion of the buffer, the buffer area shall be composed of a suitable combination of evergreen, deciduous, and flowering trees and shrubs to meet the criteria as described above.

F. Alternative Buffer

In lieu of the interplanted or non-interplanted buffer, the commission may allow an alternative landscaped buffer design that meets, or exceeds, the performance level of the interplanted buffer. Said alternative buffer shall include tree and shrub plantings and may include hedges, earthen berms, fencing, or other treatments."

2.3 **Tree Regulations**

The Zoning Regulations do not specify tree planting and protection requirements. The following text could be added to requirements of site plan applications, Section 32.1.4 as item (d.):

"The area surrounding all significant and specimen trees within the construction area which are to be preserved shall be clearly marked prior to the start of any construction activities. The area within the drip line of the trees to be preserved shall remain free of all building materials, fill, vehicles, and debris. For specimen trees and significant trees that are to be preserved, tree wells and/or tree walls shall be provided to prevent changes in grade within the drip line of the trees. In the event that a significant tree or specimen tree that is shown on an approved plan as being preserved poses a serious and imminent threat to public safety due to death, disease, or damage resulting from a natural or man-made disaster, the City Planner may authorize the removal of the tree(s). The City Planner shall submit a written report to the commission describing the reasons for authorizing the removal."

2.4 **Stormwater Management**

Section 400.3.12.n defines the requirements for an Age-Restricted Housing development. This section encourages the use of BMPs and natural filtration functions. It also

addresses water quality based on the first inch of runoff from impervious surfaces and should be revised to reference the 2004 Connecticut Stormwater Quality Manual.

Section 614.C.20 specifies the general requirements for Site Plan stormwater management in relation to parking lots. We recommend adding a new Section (622) with the following language:

All stormwater management systems in new developments shall be designed, constructed, and maintained with BMPs to minimize runoff volumes, prevent flooding, reduce soil erosion, protect water quality, maintain or improve wildlife habitat, and contribute to the aesthetic values of the project.

A. Stormwater management system designs shall meet the following general standards:

1. Provide water quality measures and pursue Low Impact Development techniques in accordance with the 2004 Connecticut Stormwater Quality Manual, as amended. This includes retaining the first inch of runoff on-site when discharging to tidal wetlands;
2. Provide stormwater conveyance systems designed in accordance with the 2000 Connecticut Department of Transportation Drainage Manual, as amended, including requirements of analysis of hydraulic grade line as well as system capacity;
3. Be designed in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control;
4. Be signed and sealed by a licensed professional engineer;
5. Be based on environmentally sound site planning and engineering techniques;
6. Include an Operations and Maintenance Plan in accordance with the most recent version of The Connecticut Stormwater Quality Manual (CTDEP). All stormwater BMPs shall be designed in a manner to minimize the need for maintenance and reduce the chances of failure;
7. Maintain, where feasible, the natural environment of City streams and drainage systems by preventing pollutants from storm runoff from entering the systems and, where feasible, restoring the floodplain to its natural functional purpose;
8. Encourage innovative design solutions to control the quality of storm runoff from development during and after construction. Natural landscape solutions such as minimization of impervious surfaces, undisturbed buffers, and filter strips are preferred over structural solutions such as detention ponds; and
9. Encourage the construction of joint detention ponds serving several properties.

B. All stormwater detention outlet structures shall be designed to control the post-development peak discharge rates from 10-, 25-, and 100-year storms to the corresponding predevelopment peak discharge rates unless it can be demonstrated that there will be no deleterious downstream effects from an increase in stormwater discharge. Generally, detention in the upper part of a watershed will be required. The City Engineer shall determine if detention in the lower third of

the watershed is necessary based on a watershed study to be performed by the design engineer.

Post development runoff volumes shall match pre-development rates wherever possible. Potential impacts to receiving water bodies must be assessed and mitigated. The applicant's engineer shall provide such information as the City Engineer deems necessary to determine the effect of the development on the existing downstream drainage facilities outside of the area of the development. Downstream drainage improvements may be required where the City Engineer anticipates that the additional runoff rate or volume resulting from the development may overload an existing downstream drainage facility.

- C. A complete runoff hydrograph evaluation is required for all projects with the potential to increase runoff rates as determined by the City Engineer or his designee. Hydrograph evaluations shall be conducted for existing and anticipated land use conditions for storms with average return frequencies of 2, 10, 25, 50, and 100 years and shall consider the full watershed discharging to the site, including upland areas in their existing condition. Hydrologic evaluations shall be completed using NRCS or USACE methods using the following 24-hour rainfall amounts with a Type III distribution:

Storm Frequency (Year Storm)	Inches of Rainfall
2	3.4
5	4.4
10	5.2
25	6.4
50	7.8
100	9.2

*These values are based on the 1997 study by the Department of Natural Resources Management and Engineering, University of Connecticut, documenting 100 years of rainfall data up through August 1996.

Project reports shall include all relevant information associated with the hydrologic evaluation, including watershed mapping, runoff curve number calculations and time of concentration calculations for both existing and proposed conditions. Calculations of stormwater runoff rates, suspended solids removal rates, and soil infiltration rates before and after completion of the activity proposed in the application shall be included. Model input and output data shall be provided in the report. Results of the analysis shall be summarized in a table form for each subwatershed as well as the overall site and shall document discharges at pre-development conditions, post development conditions without attenuation and post development with attenuation.

- D. The following design frequencies shall be used for the different storm water facilities:

Cross culverts at public roadway crossing: 100 Year Storm
Storm Drainage Conveyance Systems: 10 Year Storm

Grassed Swales: 10 Year Storm with maximum velocity of 2.5 feet/second

The site plan shall include the location, top of frame elevations, invert elevations, pipe sizes and other similar information as may be required by the commission, City engineering staff, or the commission's consulting engineering staff to properly evaluate the stormwater management plan for the site. Flow calculations shall be provided for all pipe runs and cross culverts.

- E. Infiltration of stormwater shall be accommodated to the extent possible through nonstructural approaches such as limitation of land disturbance and grade changes, preservation of natural drainage patterns, retention of existing wetlands, and creation of vegetated islands, vegetated medians, and vegetated perimeter buffer strips. On sites where little traffic is anticipated, the commission may approve the use of pervious surface materials for all or part of a parking area when such paving is part of an overall drainage design which minimizes concentration of stormwater runoff. Where feasible, roof runoff shall be collected and reintroduced to the ground water table via infiltration devices where soils and water table depths may permit. Infiltration rates shall be reduced by a safety factor of two to account for clogging over time.
- F. For sites where low impact development methods are being used to provide for stormwater management, the post construction analysis can reflect this through modification of runoff curve numbers and times of concentration.
- G. Where a development's storm drainage system is proposed to discharge into a City storm drainage system, the developer shall make provisions to accommodate anticipated additional discharge in the event the City system is not adequate. Necessary improvements to the City system to accommodate the additional stormwater discharge shall be done at the expense of the developer.
- H. Provisions shall be made for all private stormwater drains such as footing drains and yard drains. Where possible, the discharge from footing and roof drains shall be directed away from the City's piped drainage system, but where such discharges must occur, the size and location of all private drains that are connected to the public stormwater drainage system shall be shown.
- I. Direct discharge of untreated stormwater to any natural wetland or water body is prohibited. Stormwater runoff discharged to wetlands must be diffused to non-erosive velocities prior to reaching any natural wetland based on calculations submitted with the application package.
- J. The commission may send any or all information provided on anticipated stormwater flow patterns and volumes and proposed stormwater management systems to the City Engineer and/or other consulting professional or agency for review and advisory comment."

The following should be added to Section 800.

A. Stormwater Management Plan (the Plan) is required for all site plan and special permit applications except when the City Engineer or his designee grants a waiver in writing. Such waiver will only be granted if the applicant demonstrates that the stormwater goals and objectives have been met. The Plan shall consist of information and reports showing the method for managing both stormwater quantity and quality. The plan shall provide, at a minimum, the following information:

1. Soil characteristics of the site.
2. Location of the closest surface water bodies and wetlands to the site, and the depth to any groundwater or aquifer areas on or adjacent to the site. In the case of tidal waters, provide the mean high water and high tide elevations.
3. DEP ground and surface water quality classification of water bodies on and adjacent to the site.
4. Identification of any water bodies on and adjacent to the site documented by DEP as not meeting water quality standards.
5. Location, description and design computation of all proposed stormwater control BMPs for both construction activities and post-construction long-term stormwater control.
6. Proposed maintenance and operation manual or schedule for any trash hoods, catch basins, or other BMP devices used to prevent runoff, encourage sheet flow or infiltration, or treat stormwater.

2.5 Erosion and Sedimentation Control

Section 800.H.14 specifies the requirements for Erosion and Sediment Control Plans for Site Plan Approval Review. We recommend that this section be revised to expressly require contractors to control discarded building wastes, concrete truck washout, chemicals, litter, and sanitary waste. This requirement can be reiterated through the building permit process and may also be included as a condition of Planning and Zoning Commission approvals:

"No refuse or other waste materials and no liquids shall be dumped on any lot except with the approval of the Director of Ledge Light Health District and the City Zoning Commission. No refuse or other waste materials and no liquids shall be dumped on any lot or dumped or discharged into any river, stream, watercourses, storm drain, pond, lake, or swamp so as to constitute a source of water pollution. This includes debris and wastes that are generated at construction sites such as concrete truck washout, oils, gasoline, pesticides, litter, and sanitary wastes. No construction, development, or activity shall occur within the regulated area/setback of a wetland or watercourse unless approved by the New London Inland Wetlands Commission."

Additionally, text enforcing the preservation of natural features could be added to this section:

"The smallest practical area of land should be exposed at any one time during development. When land is exposed during development, the exposure should be kept to the shortest practical period of time. Land should not be left exposed during the winter months. Where necessary, temporary vegetation and/or mulching and structural measures may be required by the Zoning Enforcement Officer to protect areas exposed during the development. Sediment basins (debris basins, desilting basins, settling basins, or silt traps) shall be installed and maintained during development to remove sediment from runoff water and from land undergoing development. The 2002 Connecticut Department of Environmental Protection guidelines shall be followed as amended."

We suggest that the City amend its land use applications to include a statement to applicants notifying them of the potential need for other project permits (i.e., General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities). The language should make clear that state and federal permitting is a separate process and that receipt of local permits is not contingent upon receipt of permit from other authorities. Sample language for this notation follows:

"Applicants are advised that permits that are administered by other permitting agencies such as the Connecticut Department of Environmental Protection (DEP) or the U.S. Army Corps of Engineers may be required for their project. Applicants are responsible for contacting these agencies to determine the appropriate permits for their project. Sites that disturb in excess of one acre of area must submit registration to the DEP for a General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities."

2.6 Open Space

Section 400.3.a defines the requirements for a Cluster Residential Development. These regulations allow for the development of higher density subdivisions than normally allowed under the regulations provided a minimum area of the subdivision is set aside as open space. The current regulation specifies a minimum of 20% common area/open space, which is in keeping with many other towns in the state. However, characteristics of open space land are not clearly defined. This section should be amended to include a more specific definition of the purposes and requirements of dedicated Open Space.

"The location and configuration of the open space shall be subject to the approval of the Commission. To the extent practicable, the open space shall be contiguous and useable. Fragmentation of open space should be minimized so that resource areas are not divided into numerous small parcels located in various areas of the development, unless the conservation feature in linear or unless such configuration is necessary to connect with other streams or trails. Unless otherwise approved by the commission, the composition of the required open space or recreation lands in terms of wetlands, watercourses, steep slopes (naturally occurring slopes exceeding 25% in grade), and floodplains shall be in direct proportionality to the parcel as a whole. Open Space shall be consistent with the New London Plan of Conservation and Development.

The method of preservation and disposition of the open space shall be subject to the approval of the commission. The methods used may include, but are not limited to, the following:

- A. establishment of a neighborhood, or homeowners, association to own and maintain the land for the open space purposes intended;
- B. transfer of the land to a not for profit organization or similar entity to own and maintain the land for the open space purposes; or
- C. transfer of the land to the City of New London. Endow maintenance of usable public open space, developed as part of the subdivision."

3.0 DEFINITIONS

In the previous sections, specific items were identified in both the Subdivision and Zoning Regulations which either should have revised definitions or should include definitions that are currently not included. The following is a list of definitions that should be included in both sets of regulations:

Best Management Practices - Techniques that are effective practical ways for preventing or reducing pollution particularly those associated with stormwater.

IMPERVIOUS SURFACES - A surface composed of any material that impedes or prevents natural infiltration of water into the soil. Impervious surfaces shall include but are not limited to eaves, roofs, (including overhangs), solid decks, driveways, patios, sidewalks, parking areas, tennis courts, concrete or asphalt streets, or compacted gravel surfaces. Slatted decks, porous paving with a runoff coefficient of less than 25 percent including grass pavers, ponds, streams, and other water surfaces, including the water area of swimming pools shall be considered to be pervious. Calculation of impervious surfaces for streets shall include the area compacted for pavements of gravel base.

Impervious Surface Ratio - The area of a lot that is covered by an impervious surface divided by the total area of the lot.

Infiltration - The process of percolating precipitation into the subsoil.

Low Impact Development (LID) - A site design strategy intended to maintain or replicate predevelopment hydrology through the use of small-scale controls integrated throughout the site to manage runoff as close to its source as possible.

Nonpoint Source Pollution - Pollution caused by diffuse sources that are not regulated as point sources and are normally associated with precipitation and runoff from the land.

Permeable Paving - Materials that are alternatives to conventional pavement surfaces and that are designed to increase infiltration and reduce stormwater runoff and pollutant loads.

Rain Gardens/Biofiltration - A practice to manage and treat stormwater runoff by using a specially designed planting soil bed and planting materials to filter runoff stored in a shallow depression.

Soil Erosion and Sediment Control Plan - A scheme that minimize soil erosion and sedimentation resulting from development and includes, but is not limited to, a map and narrative.

Stormwater Management Plan - Plan describing the potential water quality and quantity impacts associated with a development project both during and after construction. It also identifies selected source controls and treatment practices to address those potential impacts, the engineering design of the treatment practices, and maintenance requirements for proper performance of the selected practices.

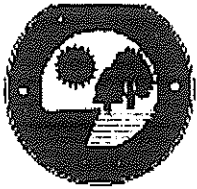
Stormwater Runoff - Above-ground water flow resulting from precipitation or snowmelt.

Stormwater Treatment Practice - Devices constructed for primary treatment, pretreatment, or supplemental treatment of stormwater.

Water Quality Swales - Vegetated open channels designed to treat and attenuate the water quality volume and convey excess stormwater runoff.

Water Quality Volume - The volume of runoff generated by one inch of rainfall on a site.

Attachment F – Results of Stormwater Sampling



**General Permit for the Discharge of Stormwater from Small
Municipal Separate Storm Sewer Systems**

1

Stormwater Monitoring Report Form

PERMITTEE INFORMATION

Town: City of New London
 Mailing Address: 111 Union St New London CT 06320
 Contact Person: Joe Julliarone Title: DV MGR Phone: 860-447-5224
 Permit Registration # GSM

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): _____
 Please circle the appropriate area description: Industrial, Commercial, or Residential
 Receiving Water (name, basin): Elm St & Rogers
 Time of Start of Discharge: _____
 Date/Time Collected: 10-6-10 8:26 AM Water Temperature: 63.1 F
 Person Collecting Sample: R. Richmond
 Storm Magnitude (inches): .50 Storm Duration (hours): 12
 Date of Previous Storm Event: _____

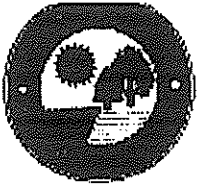
MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	EPA 150.1	6.3	KB Analytical
Rain pH	EPA 150.1	6.9	
Hardness	SM 2340C	31 mg/L	
Conductivity	SM 2510 B	94.0 µS	
Oil & Grease	EPA 1664	<1 mg/L	
COD	SM 5220D	67 mg/L	
Turbidity	SM 2130 B	16.0 NTU	
TSS	SM 2540 D	128 mg/L	
TP	SM 4500 PE	0.16 mg/L	
Ammonia	SM 4500 NH3 D	0.08 mg/L	
TKN	SM 4500 Norg B	2.95 mg/L	
NO ₃ +NO ₂	SM 4500 NO3 E	0.91 mg/L	
E. coli	SM 9221 B	22005 MPN/100 mL	

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: _____
 Signature: _____ Date: _____



**General Permit for the Discharge of Stormwater from Small
Municipal Separate Storm Sewer Systems**

②

Stormwater Monitoring Report Form

PERMITTEE INFORMATION

Town: City of WPAW Landon
 Mailing Address: 111 Union St New Landon CT 06320
 Contact Person: Joe Tallarico Title: Dir M&I Phone: 860-414-7527
 Permit Registration # GSM

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): LAUREL DR.
 Please circle the appropriate area description: Industrial, Commercial, or Residential
 Receiving Water (name, basin): _____
 Time of Start of Discharge: _____
 Date/Time Collected: 10-6-10 8:38 AM Water Temperature: 62.7 F
 Person Collecting Sample: R. Richman
 Storm Magnitude (inches): .50 Storm Duration (hours): 12
 Date of Previous Storm Event: _____

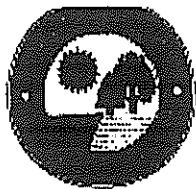
MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	EPA 150.1	6.1	KB Analytical
Rain pH	EPA 150.1	6.9	
Hardness	SM 2340C	10 mg/L	
Conductivity	SM 2510B	24.8 µS	
Oil & Grease	EPA 1664	<1 mg/L	
COD	SM 5220D	11 mg/L	
Turbidity	SM 2130B	3.7 NTU	
TSS	SM 2540D	30 mg/L	
TP	SM 4500PE	0.03 mg/L	
Ammonia	SM 4500NH3D	0.06 mg/L	
TKN	SM 4500NorgB	1.40 mg/L	
NO ₃ +NO ₂	SM 4500NO3E	0.31 mg/L	
E. coli	SM 9221B	1652 MPN/100ML	

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: _____
 Signature: _____ Date: _____



General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

3

Stormwater Monitoring Report Form

PERMITTEE INFORMATION

Town: <u>City of New London</u>
Mailing Address: <u>46 Union St</u> <u>New London CT 06320</u>
Contact Person: <u>Joe Sullivan</u> Title: <u>Div Mgr</u> Phone: <u>800-447-5224</u>
Permit Registration # <u>GSM</u>

SAMPLING INFORMATION

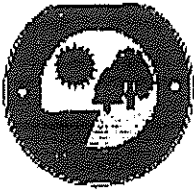
Discharge Location (Lat/Long or other description): _____	
Please circle the appropriate area description: Industrial, Commercial, or <u>Residential</u>	
Receiving Water (name, basin): <u>RIVER ST.</u>	
Time of Start of Discharge: _____	
Date/Time Collected: <u>10-6-10</u> <u>10:40 AM</u> Water Temperature: <u>61.8 F</u>	
Person Collecting Sample: <u>R. Richmond</u>	
Storm Magnitude (inches): <u>.50</u> Storm Duration (hours): <u>12</u>	
Date of Previous Storm Event: _____	

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	EPA 150.1	6.7	KB Analytical
Rain pH	EPA 150.1	6.9	
Hardness	SM 2340C	5mg/L	
Conductivity	SM 2510B	18.4 uS	
Oil & Grease	EPA 1664	<1 mg/L	
COD	SM 5220D	14 mg/L	
Turbidity	SM 2130B	5.3 NTU	
TSS	SM 2540D	28 mg/L	
TP	SM 4500PE	0.02 mg/L	
Ammonia	SM 4500NH3D	0.19 mg/L	
TKN	SM 4520NorgB	1.40 mg/L	
NO ₃ +NO ₂	SM 4500NO3E	0.05 mg/L	
E. coli	SM 9221 B	2005 MPN/100mL	

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: _____	
Signature: _____	Date: _____



General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

4

Stormwater Monitoring Report Form

PERMITTEE INFORMATION

Town: CITY of NEW London
 Mailing Address: 111 Union St N.L. CT 06320
 Contact Person: Joe Julliarne Title: Dir MGR Phone: 860-447-5324
 Permit Registration # GSM

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): _____
 Please circle the appropriate area description: Industrial Commercial or Residential
 Receiving Water (name, basin): FORT TRUMBULL
 Time of Start of Discharge: 7 AM
 Date/Time Collected: 10-6-10 10:50 AM Water Temperature: 68.9 F
 Person Collecting Sample: R Richmond
 Storm Magnitude (inches): .50 Storm Duration (hours): 12
 Date of Previous Storm Event: _____

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	EPA 150.1	7.3	KB Analytical
Rain pH	EPA 150.1	6.9	
Hardness	SM 2340 C	36 mg/L	
Conductivity	SM 2510 B	144.0 µS	
Oil & Grease	EPA 1664	<1 mg/L	
COD	SM 5220 D	6 mg/L	
Turbidity	SM 2130 B	2.8 NTU	
TSS	SM 2540 D	<2 mg/L	
TP	SM 4500 PE	0.05 mg/L	
Ammonia	SM 4500 NH3 D	0.18 mg/L	
TKN	SM 4500 Norg B	1.55 mg/L	
NO ₃ +NO ₂	SM 4500 NO3 E	0.46 mg/L	
E. coli	SM 9221 B	31 MPN/100 mL	

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: _____

Signature: _____ Date: _____



General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

5

Stormwater Monitoring Report Form

PERMITTEE INFORMATION

Town: City of New London
 Mailing Address: 111 Union St New London CT 06320
 Contact Person: Joe Juller Title: Dir MGR Phone: 860-4475224
 Permit Registration # GSM

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): Green Harbor Beach Per
 Please circle the appropriate area description: Industrial, Commercial, or Residential
 Receiving Water (name, basin): GREEN HARBOR
 Time of Start of Discharge: _____
 Date/Time Collected: 10-10-10 11:00 AM Water Temperature: 61.8 F
 Person Collecting Sample: R. Richmond
 Storm Magnitude (inches): .50 Storm Duration (hours): 10
 Date of Previous Storm Event: _____

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	EPA 150.1	6.9	KB Analytical
Rain pH	EPA 150.1	6.9	
Hardness	SM 2340C	68 mg/L	
Conductivity	SM 2510B	155 µS	
Oil & Grease	EPA 1664	<1 mg/L	
COD	SM 5220D	9 mg/L	
Turbidity	SM 2130B	0.3 NTU	
TSS	SM 2540D	14 mg/L	
TP	SM 4500PE	0.03 mg/L	
Ammonia	SM 4500NH3D	0.02 mg/L	
TKN	SM 4500NorgB	0.93 mg/L	
NO ₃ +NO ₂	SM 4500NO3E	0.15 mg/L	
E. coli	SM 9221B	2005 MPN/100mL	

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: _____
 Signature: _____ Date: _____



General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

6

Stormwater Monitoring Report Form

PERMITTEE INFORMATION

Town: <u>City of New London CT</u>
Mailing Address: <u>111 Union St New London CT 06320</u>
Contact Person: <u>Jim Tuller Title: Dist MGR Phone: 860-41475224</u>
Permit Registration # <u>GSM</u>

SAMPLING INFORMATION

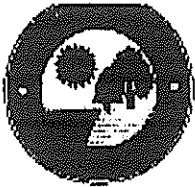
Discharge Location (Lat/Long or other description): _____	
Please circle the appropriate area description: Industrial, Commercial, or <u>Residential</u>	
Receiving Water (name, basin): <u>Greenwood Ave. + Parkway S</u>	
Time of Start of Discharge: <u>7 am</u>	
Date/Time Collected: <u>10-6-10 11:10 Am</u>	Water Temperature: <u>62.2 F</u>
Person Collecting Sample: <u>R. Richard</u>	
Storm Magnitude (inches): <u>5.0</u>	Storm Duration (hours): <u>12</u>
Date of Previous Storm Event: _____	

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH	EPA 150.1	6.7	KB Analytical
Rain pH	EPA 150.1	6.9	
Hardness	SM 2340C	28 mg/L	
Conductivity	SM 2510B	75 µS	
Oil & Grease	EPA 1664	<1 mg/L	
COD	SM 5220D	19 mg/L	
Turbidity	SM 2130B	10.9 NTU	
TSS	SM 2540D	12 mg/L	
TP	SM 4500PE	0.07 mg/L	
Ammonia	SM 4500NH3D	0.03 mg/L	
TKN	SM 4500NorgB	1.55 mg/L	
NO ₃ +NO ₂	SM 4500 NO3E	0.22 mg/L	
E. coli	SM 9221B	>2005 MPN/100ml	

STATEMENT OF ACKNOWLEDGMENT

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Authorized Official: _____	
Signature: _____	Date: _____



**General Permit for the Discharge of Stormwater from Small
Municipal Separate Storm Sewer Systems**

PH

Stormwater Monitoring Report Form

PERMITTEE INFORMATION

Town: City of New London
 Mailing Address: 111 Union St New London CT 06320
 Contact Person: Joe Julliano Title: Dir MGR Phone: 860-447-5224
 Permit Registration # GSM

SAMPLING INFORMATION

Discharge Location (Lat/Long or other description): _____
 Please circle the appropriate area description: Industrial, Commercial, or Residential
 Receiving Water (name, basin): 109 CRSTAL AVE
 Time of Start of Discharge: _____
 Date/Time Collected: 10-6-10 8:15 AM Water Temperature: 59.1 F
 Person Collecting Sample: R Richmond
 Storm Magnitude (inches): .50 Storm Duration (hours): 12
 Date of Previous Storm Event: _____

MONITORING RESULTS

Parameter	Method	Results (units)	Laboratory
Sample pH			
Rain pH	<u>EPA 150.1</u>	<u>6.9</u>	<u>KB Analytical</u>
Hardness			
Conductivity			
Oil & Grease			
COD			
Turbidity			
TSS			
TP			
Ammonia			
TKN			
NO ₃ +NO ₂			
E. coli			

STATEMENT OF ACKNOWLEDGMENT

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Authorized Official: _____
 Signature: _____ Date: _____