

Model Stormwater Control Ordinance for Municipalities



**Hunterdon County Environmental Toolbox Committee
Water Resources Subcommittee
Stormwater Work Group**

Final Version: 7 November 2005

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Important note: This model ordinance is an adaptation of the model municipal ordinance in Appendix D of the NJDEP Stormwater Management Best Management Practices Manual (February 2004 version). Notes and explanations are provided in the right hand column throughout this model stormwater control ordinance; the municipality should decide whether to adopt any of the commentary as part of the ordinance (to better establish the legislative history) or not. The model ordinance itself is shown in the left hand column and can be extracted from this Microsoft Word document by selecting the entire column and copying to a new file.

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Section 1: Scope and Purpose	
A. Policy Statement	
<p>Stormwater Management is the process of minimizing stormwater runoff and directing stormwater appropriate nonstructural and structural stormwater management measures so as to control flooding, recharge ground water and reduce pollution of water- resources. Transport of stormwater-related pollutants into local surface and ground waters can result in: the destruction of fish, wildlife, and habitats; threats to public health due to contaminated food and drinking water supplies; and losses of recreational and aesthetic values. Stormwater management shall occur with the understanding and acceptance of stormwater as a resource; low impact and non-structural measures shall be tailored to a site and applied wherever and to the extent feasible.</p>	<p>Municipalities are encouraged to participate in the development of regional stormwater management plans, and to adopt and implement ordinances for specific drainage area performance standards that address local stormwater management and environmental characteristics.</p>
B. Purpose	
<p>The purpose of this ordinance is to establish minimum stormwater management requirements and controls for major development and to reduce the amount of nonpoint source pollution entering surface and ground waters. This ordinance guides new development in a manner that is proactive and minimizes harmful impacts to natural resources. Specifically, this ordinance shall:</p> <ol style="list-style-type: none"> (1) Reduce artificially induced flood damage to public health, life, and property; (2) Minimize increased stormwater runoff rates and volumes; (3) Minimize the deterioration of existing structures that would result from increased rates of stormwater runoff; (4) Induce water recharge into the ground wherever suitable infiltration, soil permeability, and favorable geological conditions exist; (5) Prevent an increase in nonpoint source pollution; (6) Maintain the integrity and stability of stream channels and buffers for their ecological functions, as well as for drainage, the conveyance of floodwater, and other purposes; (7) Control and minimize soil erosion and the transport of sediment; (8) Minimize public safety hazards at any stormwater detention facility constructed pursuant to subdivision or site plan approval; (9) Maintain adequate baseflow and natural flow regimes in all streams and other surface water bodies to protect the aquatic ecosystem; (10) Protect all surface water resources from degradation; and (11) Protect ground water resources from degradation and diminution. 	
C. Applicability	
<p>1. This ordinance shall be applicable to all site plans and subdivisions for the following major developments that require preliminary or final site plan or subdivision review:</p>	
<p>a. Non-residential major developments; and</p>	

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<p>b. Aspects of residential major developments that are not pre-empted by the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21. The provisions of both this ordinance and the RSIS are to be applied and reviewed concurrently for any residential major development.</p>	<p>The RSIS incorporate the NJDEP Stormwater Management Rules (NJAC 7:8) by reference, which will minimize contradictions between the intent of this ordinance and the RSIS. The RSIS include provisions beyond those of this ordinance regarding the construction and materials standards for stormwater conveyances, basins, etc.</p>
<p>c. In the case of agricultural or horticultural development that meets the definition of "major development" under N.J.A.C. 7:8, a farm conservation plan that addresses the protection of soil and water resources shall be developed and implemented. Such a plan shall be approved by the Hunterdon County Soil Conservation District.</p>	<p>For more information about how to deal with soil water resources on farmland, contact the NJ Department of Agriculture, Division of Agricultural and Natural Resources, www.state.nj.us/agriculture/rural/divintro.htm</p>
<p>2. This ordinance shall also be applicable to all major developments undertaken by <i>[insert name of municipality]</i>.</p>	<p>It is important that municipalities follow the same rules as other major developments.</p>
<p>3. This ordinance does not apply to activities of Hunterdon County, the State of New Jersey and the government of the United States of America when those activities are specifically exempted from municipal regulation by relevant State or Federal law.</p>	<p>This provision exempts such developments from municipal review, but not from stormwater regulation. Public schools proposed by a Board of Education will require a NJDEP Request for Authorization (RFA) regarding construction stormwater impacts. The Soil Conservation District administers the RFA process.</p>
<p>D. Compatibility with Other Permit and Ordinance Requirements</p>	
<p>Development approvals issued for subdivisions and site plans pursuant to this ordinance are to be considered an integral part of development approvals under the subdivision and site plan review process and do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance. In their interpretation and application, the provisions of this ordinance shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. This ordinance shall be construed to assure consistency with the requirements of New Jersey laws and acts amendatory thereof or supplementary thereto, applicable implementing regulations, and any existing or future municipal NJPDES Permits and any amendments or revisions thereto or re-issuance thereof. This ordinance is not intended to interfere with, abrogate, or annul any other ordinance, rule or regulation, statute, or other provision of law. Where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, whichever provisions are more restrictive or impose higher standards shall control.</p>	

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Section 2: Definitions	These definitions are generally from the NJDEP Model Stormwater Management Ordinance unless noted.
Unless specifically defined below, words or phrases used in this ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this ordinance its most reasonable application. Where common definitions exist, the definitions below are the same as or based on the corresponding definitions in the Stormwater Management Rules at N.J.A.C. 7:8-1.2.	
“Agriculture or horticulture” or “Agricultural or horticultural use” means the use of the land for common farmsite activities including but not limited to production, harvesting, storage, grading, packaging, processing and the wholesale and retail marketing of crops, plants, animals and other related commodities and the use and application of techniques and methods of soil preparation and management, fertilization, weed, disease and pest control, disposal of farm waste, irrigation, drainage, and water management, and grazing.	This definition is from the Right to Farm Act and the Highlands Water Protection Act.
“Agricultural or horticultural development” means construction for the purposes of supporting common farmsite activities, including but not limited to: the production, harvesting, storage, grading, packaging, processing, and the wholesale and retail marketing of crops, plants, animals, and other related commodities and the use and application of techniques and methods of soil preparation and management, fertilization, weed, disease, and pest control, disposal of farm waste, irrigation, drainage and water management, and grazing.	This definition is from the Highlands Water Protection and Planning Act
“Category 1 (C1) Waters” means Waters of the State, including unnamed waterways that appear on Soil Survey and USGS Topographic Quadrangle within the same HUC 14 watershed, designated in NJAC 7:9B-1.15 (c) through (h) for purposes of implementing the anti-degradation policies set forth at NJAC 7:9B-1.5(d) for protection from measurable changes in water quality characteristics because of their clarity, color, scenic setting, other characteristics of aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resources(s).	
“Compaction” means the increase in soil bulk density caused by subjecting soil to greater-than-normal loading. Compaction can also decrease soil infiltration and permeability rates.	
“Core” means a pedestrian-oriented area of commercial and civic uses serving the surrounding municipality, generally including housing and access to public transportation.	
“County review agency” means the Hunterdon County Planning Board, as designated by the County Board of Chosen Freeholders to review municipal stormwater management plans and implementing ordinance(s).	
“Department” means the New Jersey Department of Environmental Protection.	
“Designated Center” means a State Development and Redevelopment Plan Center, such as urban, regional, town, village, or hamlet, as designated by the State Planning Commission.	
“Design engineer” means a person professionally qualified and duly licensed in New Jersey to perform engineering services that may include, but not necessarily be limited to, development of	

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project requirements, creation and development of project design and preparation of drawings and specifications.	
“Development” means the division of a parcel of land into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation or enlargement of any building or structure, any mining excavation or landfill, and any use or change in the use of any building or other structure, or land or extension of use of land, by any person, for which permission is required under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq. In the case of development of agricultural lands, development means: any activity that requires a State permit; any activity reviewed by the County Agricultural Board (CAB) and the State Agricultural Development Committee (SADC), and municipal review of any activity not exempted by the Right to Farm Act, N.J.S.A 4:1C-1 et seq.	
“Disturbance” means any activity including the clearing, excavating, storing, grading, filling or transportation of soil or any other activity that causes soil to be exposed to the danger of erosion.	This definition is from the Soil Erosion and Sediment Control Act
“Drainage area” means a geographic area within which stormwater, sediments, or dissolved materials drain to a particular receiving waterbody or to a particular point along a receiving waterbody.	
“Environmentally critical area” means an area or feature which is of significant environmental value, including but not limited to: stream corridors; natural heritage priority sites; habitat of endangered or threatened species; large areas of contiguous open space or upland forest; steep slopes; well head protection areas; and ground water recharge areas. Habitats of endangered or threatened species are those identified by the Department’s Landscape Project as approved by the Department’s Endangered and Nongame Species Program, or by the Department pursuant to the Highlands Act at NJSA 13:20-32k. and 13:20-34a(4).	
“Erosion” means the detachment and movement of soil or rock fragments by water, wind, ice or gravity.	
“Ground water” means a body of water below the surface of the land in a zone of saturation where the spaces between the soil or geological materials are fully saturated with water.	Definition from the NJ Ground Water Quality Standards at NJAC 7:9A
“Highlands Act” means the Highlands Water Protection and Planning Act, P.L. 2004, c.120, codified at N.J.S.A. 13:20-1 et. seq. as amended.	
“HUC-14” means a watershed as defined by the United States Geological Survey with a 14-digit identifier; a subwatershed.	
“Impervious surface” means a surface that has been covered with a layer of material so that it is highly resistant to infiltration by water relative to natural conditions in the area.	This definition does not include naturally impermeable areas (e.g., rocks), soil compaction (which is defined separately) or a specific threshold permeability rate to define “impervious.”
“Infiltration” is the process by which water from precipitation seeps into the soil to a level below the normal root soil of plant species.	

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<p>"Karst Terrain" means an area where karst topography, with its characteristic surface and subterranean features, is developed as a result of the dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terrains include but are not limited to sinkholes, sinking streams, caves, blind valleys, large springs and subterranean drainage. See also limestone area.</p>	
<p>"Limestone area" means an area of Hunterdon County underlain by carbonate sedimentary rock consisting chiefly of calcium carbonate. Limestone is commonly used as a general term for the class of rocks that consist of at least 80 percent calcium or magnesium carbonate. See also karst terrain.</p>	<p>Definition derived from the Residential Site Improvement Standards (RSIS)</p>
<p>"Low Impact Development" (LID) means methods incorporating design measures to replicate pre-development hydrology to reduce the impacts of development at a lot-level basis, treating rainwater where it falls by creating conditions that allow the water to infiltrate back into the ground. LID emphasizes greater infiltration of stormwater on-site rather than regarding the stormwater as a nuisance condition and disposable.</p>	
<p>"Maintenance Plan" means a document required for all major development projects for stormwater management maintenance. The document shall contain specific preventive maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal; and the name, address, and telephone number of the person or persons responsible for preventive and corrective maintenance (including replacement).</p>	
<p>"Major development" means any "development" that provides for ultimately disturbing one or more acres of land or would create one-quarter acre or more of impervious surface.</p>	<p>The Highlands Water Protection and Preservation Act defines "Major Highlands Development" as (1) any non-residential development in the preservation area; (2) any residential development in the preservation area that requires an environmental land use or water permit or that results in the ultimate disturbance of one acre or more of land or a cumulative increase in impervious surface by one-quarter acre or more; (3) any activity undertaken or engaged in the preservation area that is not a development but results in the ultimate disturbance of one-quarter acre or more of forested area or that results in a cumulative increase in impervious surface by one-quarter acre or more on a lot; or (4) any capital or other project of a State entity or local government unit in the preservation area that requires an environmental land use or water permit or that results in the ultimate disturbance of one acre or more of land or a cumulative increase in impervious surface by one-quarter acre or more. Major Highlands development shall not mean an agricultural or horticultural development or agricultural or horticultural use in the preservation area.</p>

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<p>“Maximum Extent Practicable” means compliance with the specific objective to the greatest extent possible taking into account equitable considerations and competing factors, including but not limited to, environmental benefits, pollutant removal effectiveness, regulatory compliance, ability to implement given site-specific environmental conditions, cost and technical or engineering feasibility.</p>	
<p>“Mitigation” means an action by an applicant -providing compensation or offset actions for onsite stormwater management requirements where the applicant has demonstrated the inability or impracticality of strict compliance with the stormwater management requirements set forth in NJAC 7:8, in an adopted regional stormwater management plan, or in this local ordinance, and has received a waiver from strict compliance from the municipality. Mitigation, for the purposes of this ordinance, includes both the mitigation plan detailing how the project’s failure to strictly comply will be compensated, and the implementation of the approved mitigation plan within the same HUC-14 within which the subject project is proposed (if possible and practical), or a contribution of funding toward a regional stormwater control project, or provision for equivalent treatment at an alternate location, or other equivalent water quality benefit.</p>	
<p>“Municipality” means any city, borough, town, township, or village.</p>	
<p>“Node” means an area designated by the State Planning Commission concentrating facilities and activities that are not organized in a compact form.</p>	
<p>“Nonstructural Stormwater Management Techniques” means techniques that control or reduce stormwater runoff in the absence of stormwater structures (e.g., basins and piped conveyances), such as minimizing site disturbance, preserving important site features including, but not limited to, natural vegetation, reducing and disconnecting impervious cover, minimizing slopes, utilizing native vegetation, minimizing turf grass lawns, increasing time of concentration and maintaining and enhancing natural drainage features and characteristics.</p>	
<p>“Nutrient” means a chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the development of plants, algae and other organisms or vegetation.</p>	
<p>“Nutrient load” means the total amount of a nutrient such as nitrogen or phosphorus entering the water during a given time, such as "tons of nitrogen per year", or "pounds of phosphorus per day." Nutrients may enter the water from runoff, ground water recharge, point source discharges, or the air (in the form of wet deposition such as rain or snow as well as dry deposition).</p>	<p>Definition derived from the Chesapeake Bay Water Quality Management Program</p>
<p>“Nutrient concentration” means the amount of a nutrient in a defined volume of water (such as milligrams of nitrogen per liter). The relationship between nutrient concentration and nutrient load can vary and depends on the surface water flow, the volume of water in the water body or aquifer, and watershed characteristics.</p>	<p>Definition derived from the Chesapeake Bay Water Quality Management Program</p>
<p>“Permeable” means a surface or land cover capable of transmitting or percolating a significant amount of precipitation into the underlying soils.</p>	

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<p>“Person” means any individual, corporation, company, partnership, firm, association, [<i>insert name of municipality</i>], or political subdivision of this State subject to municipal jurisdiction pursuant to the Municipal Land Use Law , N.J.S.A. 40:55D-1 et seq.</p>	
<p>“Pollutant” means any dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, refuse, oil, grease, sewage sludge, munitions, chemical wastes, biological materials, medical wastes, radioactive substance (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.), thermal waste, wrecked or discarded equipment, rock, sand, cellar dirt, industrial, municipal, agricultural, and construction waste or runoff, or other residue discharged directly or indirectly to the land, ground waters or surface waters of the State, or to a domestic treatment works. “Pollutant” includes both hazardous and nonhazardous pollutants.</p>	<p>This definition is from the NJ Water Pollution Control Act and is used by NJDEP regarding municipal NJPDES permits</p>
<p>“Pollution” means the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water to the extent that the pollutant concentration or level violates either the Ground Water Quality Standards (N.J.A.C. 7:9-6) or the Surface Water Quality Standards (N.J.A.C. 7:9B) of New Jersey.</p>	<p>Definition derived in part from the federal Clean Water Act (Chapter 26, Subchapter V, Section 1362) but made specific to New Jersey.</p>
<p>“Recharge” means the amount of water from precipitation that infiltrates into the ground, and becomes part of a ground water body.</p>	<p>This definition provides for a distinction between infiltration, which penetrates below the land surface but may not reach the water table, and recharge, which does reach the water table.</p>
<p>“Review agency (municipal)” means the municipal body or official that is responsible for the review of a major development project for compliance with the stormwater management requirements.</p>	
<p>“Sediment” means solid material, mineral or organic, that is in suspension and is being transported or has been moved from its site of origin by air, water or gravity as a product of erosion.</p>	
<p>“Site” means the lot or lots upon which a major development is to occur or has occurred.</p>	
<p>“Soil” means all unconsolidated mineral and organic material of any origin.</p>	
<p>“Solid and floatable materials” means sediment, debris, trash, and other floating, suspended, or settleable solids.</p>	
<p>“Source material” means any material(s) or machinery, located at an industrial facility, that is directly or indirectly related to process, manufacturing, or other industrial activities, that could be a source of pollutants in any industrial stormwater discharge to ground or surface water. Source materials include, but are not limited to raw materials, intermediate products, final products, waste materials, by-products, industrial machinery and fuels, and lubricants, solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.</p>	<p>This definition is from the NJDEP’s BMP Manual</p>

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<p>“Special Resource Waters” means water bodies receiving special protections due to their drinking water status or role as high-quality habitat for Threatened and Endangered species or species of commercial or recreational importance. This includes waterways so designated through the NJ Stormwater Management Rules (N.J.A.C. 7:8) because of exceptional ecological significance, exceptional water supply significance, exceptional recreational significance, exceptional shellfish resource, or exceptional fisheries resource. Waters so designated are protected by a 300-foot buffer extending on either side of the waterway measured perpendicular from top-of-bank or center of channel for waterways lacking a defined top-of-bank.</p>	
<p>“State Development and Redevelopment Plan Metropolitan Planning Area (PA1)” means an area delineated on the State Plan Policy Map and adopted by the State Planning Commission that is intended to be the focus for much of the state’s future redevelopment and revitalization efforts.</p>	
<p>“State Plan Policy Map” is defined as the geographic application of the State Development and Redevelopment Plan’s goals and statewide policies, and the official map of these goals and policies.</p>	
<p>“Stormwater” means water resulting from precipitation (including rain and snow) that runs off the land’s surface, is transmitted to the subsurface, or is captured by separate storm sewers or other sewage or drainage facilities, or conveyed by snow removal equipment.</p>	
<p>“Stormwater runoff” means the flow of stormwater on or across the surface of the ground, in drainage facilities or in storm sewers.</p>	<p>NJDEP defines stormwater runoff as a subset of stormwater.</p>
<p>“Stormwater management basin” means an excavation or embankment and related areas designed to retain stormwater runoff. A stormwater management basin may either be normally dry (that is, a detention basin or infiltration basin), retain water in a permanent pool (a retention basin), or be planted mainly with wetland vegetation (a constructed stormwater wetland).</p>	
<p>“Stormwater management measure” means any structural or nonstructural strategy, practice, technology, process, program, or other method intended to control or reduce stormwater runoff and associated pollutants, or to induce or control the infiltration or ground water recharge of stormwater or to eliminate illicit or illegal non-stormwater discharges into stormwater conveyances.</p>	
<p>“Stream buffer” means a strip of land located immediately adjacent to a stream channel consisting of natural, undisturbed vegetative cover, which serves as a transition area between uplands and riparian lands. A stream buffer may encompass wetlands, may be contained with a flood plain or floodway or may extend beyond a wetland, floodplain or floodway boundary.</p>	
<p>“Structural Stormwater Techniques” means a stormwater management measure that involves control of concentrated stormwater runoff or infiltration such as stormwater basins, piped conveyance systems and manufactured stormwater devices, and can include various types of basins, filters, surfaces, and devices located on individual lots in a residential development or throughout a commercial, industrial, or institutional development site in areas not typically suited for larger, centralized structural facilities.</p>	

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<p>"Threatened and Endangered Species" – Endangered Species are those whose prospects for survival in New Jersey are in immediate danger because of a loss or change in habitat, over-exploitation, predation, competition, disease, disturbance or contamination. Assistance is needed to prevent future extinction in New Jersey. Threatened Species are those who may become endangered if conditions surrounding them begin to or continue to deteriorate. Habitats of endangered or threatened species are those identified by the Department's Landscape Project as approved by the Department's Endangered and Nongame Species Program, or by the Department pursuant to the Highlands Act at NJSA 13:20-32k. and 13:20-34a(4).</p>	<p>This definition is derived from the NJDEP-Division of Fish and Wildlife</p>
<p>"Time of concentration" is defined as the time it takes for stormwater runoff to travel from the hydraulically most distant point of the watershed to the point of interest within a watershed.</p>	
<p>"Transition area" means an area of protected upland adjacent to a freshwater wetland that minimizes adverse impacts on the wetland or serves as an integral component of the wetlands ecosystem. Also called "buffer" area.</p>	<p>Definition derived from NJDEP-Land Use Regulation Program glossary</p>
<p>"Urban Redevelopment Area" is defined as previously developed portions of areas delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1); Designated Centers, Cores or Nodes.</p>	
<p>"Waters of the State" means the ocean and its estuaries, all springs, streams, wetlands, and bodies of surface or ground water, whether natural or artificial, within the boundaries of the State of New Jersey or subject to its jurisdiction.</p>	
<p>"Wetlands" or "wetland" means an area that is inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.</p>	<p>Definition from NJDEP Freshwater Wetlands Protection Act Rules, NJAC 7:7A-1.2</p>
<p>Section 3: General Standards</p>	
<p><i>A. Design and Performance Standards for Stormwater Management Measures</i></p>	
<p>1. Stormwater management measures for major development shall be designed to meet the erosion control, ground water recharge, and stormwater runoff quantity and quality standards in Section 4, as described in technical guidance documents listed in Section 7. As detailed in Section 4, to the maximum extent practicable, these standards shall be met by incorporating nonstructural stormwater management strategies into the design. If these strategies alone are not sufficient to meet these standards, structural stormwater management measures necessary to meet these standards shall be incorporated into the design along with the practicable nonstructural strategies.</p>	

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<p>2. The standards in this ordinance apply to both new major development and redevelopment and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain ground water recharge. The standards do not apply to major development to the extent that alternative design and performance standards are applicable under a regional stormwater management plan or Water Quality Management Plan adopted in accordance with Department rules.</p>	<p>Alternative standards shall provide at least as much protection from stormwater-related loss of ground water recharge, stormwater quantity and water quality impacts of major development projects as would be provided under the standards in N.J.A.C. 7:8-5.</p>
<p>Section 4: Stormwater Management Requirements for Major Development</p>	
<p>A. Nonstructural Stormwater Management Strategies</p>	
<p>1. To the maximum extent practicable, the standards in Subsections 4.B and 4.C shall be met by incorporating nonstructural stormwater management strategies set forth in this subsection into the design. The applicant shall identify the nonstructural measures incorporated into the design of the project. Documentation of the use of nonstructural stormwater management measures shall require the preparation by the applicant of the NJDEP Low Impact Development checklist. If the applicant contends that it is not feasible for engineering, environmental, or safety reasons to incorporate any or only specific nonstructural stormwater management measures identified in Subsection 4.A2 below into the design of a particular project, the applicant shall identify the strategy or strategies considered and provide a basis for the contention. In both cases, the applicant bears the burden of proving any impracticability.</p>	<p>Currently there is no quantifiable requirement for the use of nonstructural measures. All nonstructural strategies identified must be considered in design; however, nonstructural measures may not sufficiently meet the design standards. If nonstructural measures do not meet the design standards, then structural measures may be considered to augment the feasible nonstructural measures. The applicant bears the burden of proving that nonstructural measures are insufficient. Strategies are mandatory, but measures are flexible. Municipality can decide which types of measures are acceptable (constraining the options).</p>
<p>2. Nonstructural stormwater management strategies incorporated into site design shall:</p>	
<p>a. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;</p>	<p>Riparian areas and soils with high erosion potential are key areas.</p>
<p>b. Minimize the creation of new impervious surfaces and reduce, break up or otherwise disconnect the flow of runoff over impervious surfaces;</p>	<p>Municipalities may wish to consider mandating that all flows from low-density impervious cover shall be disconnected.</p>
<p>c. Maximize the protection of natural drainage features and vegetation, except where native or natural vegetation is considered invasive;</p>	
<p>d. Minimize the decrease in the "time of concentration" from pre-construction to post construction;</p>	<p>As the "time of concentration" decreases, water moves faster to basins and streams, increasing flood potential.</p>
<p>e. Minimize land clearing and disturbance and overall site grading;</p>	<p>Natural terrain generally has many points where stormwater naturally collects and slows; grading the surface therefore increases the rate of runoff.</p>
<p>f. Minimize soil compaction;</p>	<p>At the municipality's discretion, soil compaction testing before construction and after construction should be required.</p>
<p>g. Retain native, non-invasive vegetation, plant low-maintenance landscaping, plant native vegetation, and minimize the creation of lawns and the use of plantings and vegetation that require the excessive use of fertilizers, pesticides and irrigation;</p>	

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h. Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas;	
i. Provide other source controls to prevent or minimize the use, exposure and/or mobilization of pollutants and prevent or minimize the release and transport of those pollutants into stormwater runoff. Such source controls include, but are not limited to:	
(1) Site design features that help to prevent accumulation of trash and debris in drainage systems, including features that satisfy Section 4.A.3. below;	
(2) Site design features that help to prevent discharge of trash and debris from drainage systems;	
(3) Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and	
(4) When establishing vegetation after land disturbance, application fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules. Prior to applying fertilizer, soil tests must be conducted onsite to determine the type of fertilization necessary.	Soil test results should be discussed with the Hunterdon County Soil Conservation District to avoid excessive fertilization. Also consult with them regarding seeding rates, as some situations require more seeding than suggested by the NJDEP BMP Manual.
3. Site design features identified under Section 4.A.2.i.(2) above shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For exemptions to this standard see Section 4.A.3.c below.	
a. Design engineers shall use either of the following grates whenever they use a grate in pavement or another ground surface to collect stormwater from that surface into a storm drain or surface water body under that grate:	
(1) The New Jersey Department of Transportation (NJDOT) bicycle safe grate, which is described in Chapter 2.4 of the NJDOT Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines (April 1996); or	
(2) A different grate, if each individual clear space in that grate has an area of no more than seven (7.0) square inches, or is no greater than 0.5 inches across the smallest dimension.	Examples of grates subject to this standard include grates in grate inlets, the grate portion (non-curb-opening portion) of combination inlets, grates on storm sewer manholes, ditch grates, trench grates, and grates of spacer bars in slotted drains. Examples of ground surfaces include surfaces of roads (including bridges), driveways, parking areas, bikeways, plazas, sidewalks, lawns, fields, open channels, and stormwater basin floors.
b. Whenever design engineers use a curb-opening inlet, the clear space in that curb opening (or each individual clear space, if the curb opening has two or more clear spaces) shall have an area of no more than seven (7.0) square inches, or be no greater than two (2.0) inches across the smallest dimension.	
c. This standard does not apply:	
(1) Where the review agency determines that this standard would cause inadequate hydraulic performance that could not practicably be overcome by using additional or larger storm drain inlets that meet these standards;	A municipality can designate a specific person such as town engineer, special engineer, etc. to review specific cases.

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(2) Where flows from the water quality design storm as specified in Section 4.C.1 are conveyed through any device (e.g., end of pipe netting facility, manufactured treatment device, or a catch basin hood) that is designed, at a minimum, to prevent delivery of all solid and floatable materials that could not pass through one of the following:	
(1) A rectangular space four and five-eighths inches long and one and one-half inches wide (this option does not apply for outfall netting facilities); or	
(2) A bar screen having a bar spacing of 0.5 inches.	
(3) Where flows are conveyed through a trash rack that has parallel bars with one-inch (1") spacing between the bars, to the elevation of the water quality design storm as specified in Section 4.C.1; or	
(4) Where the New Jersey Department of Environmental Protection determines, pursuant to the New Jersey Register of Historic Places Rules at N.J.A.C. 7:4-7.2(c), that action to meet this standard is an undertaking that constitutes an encroachment or will damage or destroy the New Jersey Register listed historic property.	
4. Any land area used as a nonstructural stormwater management measure to meet the performance standards in Sections 4.B and 4.C shall be: (a) dedicated to a government agency;, (b) subjected to a conservation restriction filed with the Hunterdon County Clerk's office; or (c) subject to an approved equivalent restriction that ensures that measure or an equivalent stormwater management measure approved by the reviewing agency is maintained in perpetuity.	
5. Guidance for nonstructural stormwater management strategies is available in the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in Section 7, or found on the Department's website at www.njstormwater.org .	NJDEP is currently developing a point system to help quantify the use of nonstructural BMPs. This point system will be made available to municipalities in the future.
<i>B. Erosion Control, Ground Water Recharge and Stormwater Runoff Quantity Control Standards</i>	
1. This subsection contains minimum design and performance standards to control erosion, maintain ground water recharge, and control stormwater runoff quantity impacts of major development projects.	
a. The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq. and implementing rules.	
b. The minimum design and performance standards for ground water recharge are as follows:	
(1) Using the criteria for calculating stormwater runoff and ground water recharge in Section 5B, the design engineer shall comply with at least one of the following standards:	Information regarding the methodology is available in the New Jersey BMP Manual.
(a.) Demonstrate through hydrologic and hydraulic analysis that the post-developed project site maintains 100 percent of the site's pre-developed average annual ground water recharge volume; or	

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(b.) Demonstrate through hydrologic and hydraulic analysis that any increase in the project site's projected stormwater runoff volume produced by the 2-Year, 24-hour storm from pre-developed to post-developed conditions is fully infiltrated.	
(2) Ground water recharge is not required at major development projects located within an "urban redevelopment area" as defined in Section 2 or from those portions of major development projects that produce stormwater runoff described in (3) below.	
(3) The following two types of stormwater runoff shall not be recharged:	
(a.) Stormwater runoff from areas of high pollutant loading. High pollutant loading areas are: 1) areas in industrial and commercial developments where solvents and/or petroleum products are loaded/unloaded, stored, or applied; 2) areas where pesticides are loaded/unloaded or stored; 3) areas where hazardous materials are expected to be present in greater than "reportable quantities" as defined by the United States Environmental Protection Agency (EPA) at 40 CFR 302.4; and 4) areas where recharge would be inconsistent with a Department approved remedial action work plan or landfill closure plan and areas with high risks for spills of toxic materials, such as gas stations and vehicle maintenance facilities; and	
(b.) Stormwater runoff from industrial areas exposed to "source material."	
(4) The design engineer shall assess and certify the hydraulic impact on the ground water table and design the project site and all site ground water recharge measures so as to avoid adverse hydraulic impacts. Adverse hydraulic impacts include, but are not limited to, raising the ground water table so as to cause surface ponding, flooding of basements and other subsurface facilities, and interference with the proper operation of subsurface sewage disposal systems and other subsurface structures in the vicinity of a ground water recharge measure.	This analysis can be limited to the immediate area around and within the development. A municipality may wish to allow its engineer to approve limiting this assessment based on whether the development has features or structures that could be harmed by hydraulic impacts. The report should be extensive enough that the design engineer is willing to certify that he or she has studied the situation and believes that the recharge facilities will not adversely effect health or property.
c. The minimum design and performance standards for the control of stormwater runoff quantity are as follows:	
(1) Using the criteria for calculating stormwater runoff and ground water recharge in Section 5, the design engineer shall comply with at least one of the following standards:	
(a.) Demonstrate through hydrologic and hydraulic analysis that the post-developed stormwater runoff hydrographs from the project site for the 2, 10, and 100-Year storms do not exceed, at any point in time, the site's pre-developed runoff hydrographs for the same storms;	
(b.) Demonstrate through hydrologic and hydraulic analysis that under post-developed site conditions: 1) there is no increase in pre-developed stormwater runoff rates from the project site for the 2, 10, and 100-Year storms; and 2) any increased stormwater runoff volume or change in stormwater runoff timing for these storms will not increase flood damage at or downstream of the project site. When performing this analysis for pre-	

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<p>developed site conditions, all off-site development levels shall reflect existing conditions. When performing this analysis for post-developed site conditions, all off-site development levels shall reflect full development in accordance with current zoning and land use ordinances.</p>	
<p>(c.) Design onsite stormwater management measures so that the peak post-developed stormwater runoff rates from the project site for the 2, 10 and 100-Year storms are 50, 75 and 80 percent, respectively, of the site's peak pre-developed stormwater runoff rates. Peak stormwater outflow rates for these storms shall be adjusted where necessary to account for the discharge of increased stormwater runoff rates and/or volumes from project site areas not controlled by the onsite measures. The percentages do not have to be applied to those portions of the project site that are not proposed for development at the time of application provided that such areas are: 1) protected from future development by conservation easement, deed restriction, or other acceptable legal measures or 2) would be subject to review under these standards if they are proposed for any degree of development in the future.</p>	
<p>2. Any application for a new agricultural or horticultural development that meets the definition of major development in Section 2 shall be submitted to the appropriate Soil Conservation District for review and approval in accordance with the requirements of this section and any applicable Soil Conservation District guidelines for stormwater runoff quantity and erosion control.</p>	
<p>C. Stormwater Runoff Quality Standards</p>	
<p>1. Stormwater management measures shall be designed to reduce by 80 percent the anticipated post-construction load of total suspended solids (TSS) in stormwater runoff from the developed site, expressed as pounds per year. Stormwater management measures shall also be in conformance with Section 4.C.8.c of this ordinance. Stormwater management measures shall only be required for water quality control if an additional 1/4 acre or more of impervious surface is being proposed on a development site. The requirement to reduce TSS does not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the New Jersey Pollution Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in a discharge specifically exempt under a NJPDES permit from this requirement. Daily limits of TSS (TMDL) may apply to the site development based on conditions of regulatory approvals.</p>	
<p>2. The water quality design storm shall be 1.25 inches of rainfall in two hours. Water quality calculations shall take into account the distribution of rain from the water quality design storm, as reflected in Table 1, subject to revision due to subsequent rule changes. The calculation of the volume of runoff may take into account the implementation of non-structural and structural stormwater management measures</p>	

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Table 1: Water Quality Design Storm Distribution				
Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)	
0	0.0000	65	0.8917	
5	0.0083	70	0.9917	
10	0.0166	75	1.0500	
15	0.0250	80	1.0840	
20	0.0500	85	1.1170	
25	0.0750	90	1.1500	
30	0.1000	95	1.1750	
35	0.1330	100	1.2000	
40	0.1660	105	1.2250	
45	0.2000	110	1.2334	
50	0.2583	115	1.2417	
55	0.3583	120	1.2500	
60	0.6250			
<p>3. For purposes of TSS reduction calculations, Table 2 below presents the presumed removal rates for certain BMPs designed, constructed and maintained in accordance with the New Jersey Stormwater Best Management Practices Manual, subject to revision due to subsequent rule changes. The current edition of the BMP Manual may be obtained from the address identified in Section 7, or found on the Department's website at www.njstormwater.org. The BMP Manual and other sources of technical guidance are listed in Section 7. TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2 below. Alternative BMPs, removal rates and methods of calculating removal rates may be approved if the design engineer provides documentation demonstrating the capability of these alternative BMPs, removal rates and computational methods to the review agency. Documentation for alternative rates and methods shall consist of published (peer-reviewed) journal article or scientific paper. A copy of any approved alternative rate or method of calculating the removal rate, including documentation, shall be provided to the Department at the following address: Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418 Trenton, New Jersey, 08625-0418.</p>				<p>Municipalities with Category 1 streams may wish to consider development of a regional stormwater management plan with more stringent TSS removal methods and standards to ensure that there is no degradation of the stream, in support of policies from the NJ Surface Water Quality Standards, N.J.A.C. 7:9B-1.5.</p>

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<p>4. If more than one BMP in series is necessary to achieve the required 80 percent TSS reduction for a site, the applicant shall utilize the following formula to calculate TSS reduction:</p> $R = A + B - (AXB)/100$ <p>Where R = total TSS percent load removal (expressed as a whole number) from application of both BMPs, and A = the TSS percent removal rate (whole number) applicable to the first (upstream) BMP B = the TSS percent removal rate (whole number) applicable to the second (downstream) BMP</p> <p>In cases where three (or more) BMPs are used in series, the applicant shall calculate the TSS reduction for the two most upstream BMPs in the series using the above formula, then substitute the result (R) of that calculation in the formula for "A" when calculating the combined result with the next BMP in the series.</p>	<p>Example: Three BMPs in series with removal rates of 50, 60 and 50 percent, respectively.</p> <p>Combined removal rate of first two BMPs with 50 and 60 percent rates = 80 percent by formula.</p> $50 + 60 - (50 \times 60)/100 = 80$ <p>Then, substitute 80 percent from the first two BMPs into formula with the subsequent 50 percent removal BMP = 90 percent overall performance.</p> $80 + 50 - (80 \times 50)/100 = 90$																				
<table border="1"> <thead> <tr> <th colspan="2" data-bbox="281 574 1276 634">Table 2: TSS Removal Rates for BMPs (Source: New Jersey Stormwater Best Management Practices Manual)</th> </tr> <tr> <th data-bbox="281 639 751 695">Best Management Practice</th> <th data-bbox="758 639 1276 695">TSS Percent Removal Rate</th> </tr> </thead> <tbody> <tr> <td data-bbox="281 699 751 735">Bioretention Systems</td> <td data-bbox="758 699 1276 735">90</td> </tr> <tr> <td data-bbox="281 740 751 776">Constructed Stormwater Wetland</td> <td data-bbox="758 740 1276 776">90</td> </tr> <tr> <td data-bbox="281 781 751 816">Extended Detention Basin</td> <td data-bbox="758 781 1276 816">40-60</td> </tr> <tr> <td data-bbox="281 821 751 857">Infiltration Structure</td> <td data-bbox="758 821 1276 857">80</td> </tr> <tr> <td data-bbox="281 862 751 898">Manufactured Treatment Device</td> <td data-bbox="758 862 1276 898">See Section 6.C</td> </tr> <tr> <td data-bbox="281 902 751 938">Sand Filter</td> <td data-bbox="758 902 1276 938">80</td> </tr> <tr> <td data-bbox="281 943 751 979">Vegetative Filter Strip</td> <td data-bbox="758 943 1276 979">60-80</td> </tr> <tr> <td data-bbox="281 984 751 1005">Wet Pond</td> <td data-bbox="758 984 1276 1005">50-90</td> </tr> </tbody> </table>	Table 2: TSS Removal Rates for BMPs (Source: New Jersey Stormwater Best Management Practices Manual)		Best Management Practice	TSS Percent Removal Rate	Bioretention Systems	90	Constructed Stormwater Wetland	90	Extended Detention Basin	40-60	Infiltration Structure	80	Manufactured Treatment Device	See Section 6.C	Sand Filter	80	Vegetative Filter Strip	60-80	Wet Pond	50-90	
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<p>5. If there is more than one onsite drainage area, the 80 percent TSS removal rate shall apply to the discharge of each drainage subarea, unless the runoff from the subareas converge on site, in which case the removal rate can be demonstrated through a calculation using an area-weighted average.</p>																					
<p>6. Stormwater management measures shall also be designed to reduce, to the maximum extent practicable, the post-construction nutrient load from the developed site in stormwater runoff generated from the water quality design storm. In achieving reduction of nutrients to the maximum extent practicable, the design of the site shall include nonstructural strategies and structural measures that optimize nutrient removal while still achieving the performance standards in Sections 4.B and 4.C. This standard may be superseded by a more stringent numeric effluent limitation imposed under the New Jersey Pollution Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in a discharge specifically exempt under a NJPDES permit from this requirement. Daily limits for nutrient loading (TMDL) may apply to the site development based on conditions of regulatory approvals.</p>	<p>This provision of the model ordinance is required by NJDEP but lacks details. Municipalities must implement this to their best ability, using the best professional judgment of their engineer, planner and special professionals (including those with experience in the non-structural and biological methods).</p>																				

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7. Additional information and examples are contained in the New Jersey Stormwater Best Management Practices Manual, which may be obtained from the address identified in Section 7.	Table 4.2, contained in the Chapter 4 of the BMP manual, can be used to estimate anticipated nutrient load reductions.
8. In accordance with the definition of FW1 at N.J.A.C. 7:9B-1.4, stormwater management measures shall be designed to prevent any increase in stormwater runoff and any new stormwater discharge point to waters classified as FW1.	FW1 waters are subject to a more stringent standard than Category 1 waters: no additional discharge, rather than just nondegradation.
9. Special water resource protection areas shall be established along all waters designated Category One at N.J.A.C. 7:9B, and along all perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated HUC14 drainage area. Other authoritative sources of stream delineation may be utilized, such as a delineation that is part of the Municipal or Regional Stormwater Management Plan or a stream delineation overlay prepared by the Department. These areas shall be designated and protected as follows:	
a. The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following, unless superceded by a local Stream Corridor Protection Ordinance:	A stream corridor protection plan may be developed by a regional stormwater management planning committee as an element of a regional stormwater management plan, or by a municipality through an adopted municipal stormwater management plan. If a stream corridor protection plan for a waterway subject to Section 4.C(8) has been approved by the Department of Environmental Protection, then the provisions of the plan shall be the applicable special water resource protection area requirements for that waterway.
(1) A 300-foot special water resource protection area shall be provided on each side of the waterway, measured perpendicular to the waterway from the top of the bank outwards or from the centerline of the waterway where the bank is not defined, consisting of existing vegetation or vegetation allowed to follow natural succession.	
(2) Encroachment within the designated special water resource protection area under Subsection (1) above shall only be allowed where previous development or disturbance has occurred (for example, pre-existing active agricultural use, parking area or maintained lawn area). The encroachment shall only be allowed where the applicant demonstrates to the satisfaction of the review agency that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable. In no case shall the remaining special water resource protection area be reduced to less than 150 feet as measured perpendicular to the top of bank of the waterway or centerline of the waterway where the bank is undefined. All encroachments proposed under this subparagraph shall be subject to review and approval by the Department.	Municipalities should bear in mind that certain types of ordinances regulating existing, active farmland can preclude farmers from applying for federal farm bill conservation dollars. Specifically mandating preservation of buffers for existing farmland may exclude farmers from the Conservation Reserve Enhancement Program (CREP), which was established in New Jersey with the cooperation of NJDEP, NJDA and NRCS/USDA.
b. All stormwater shall be discharged outside of and flow through the special water resource protection area and shall comply with the Standard for Off-Site Stability in the "Standards For Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act , N.J.S.A. 4:24-39 et seq.	

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c. If stormwater discharged outside of and flowing through the special water resource protection area cannot comply with the Standard For Off-Site Stability in the "Standards for Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act , N.J.S.A. 4:24-39 et seq., then the stabilization measures in accordance with the requirements of the above standards may be placed within the special water resource protection area, provided that:	
(1) Stabilization measures shall not be placed within 150 feet of the Category One waterway;	
(2) Stormwater discharges allowed by this section shall achieve a 95 percent TSS post-construction removal rate;	
(3) Thermal pollution by stormwater discharges shall be addressed to ensure no significant increase or decrease in temperature occurs in the receiving waterway outside of the mixing zone;	The municipality will need to address issues such as shading, use of infiltration trenches, and other methods to ensure that stormwater achieves a temperature close to ambient stream temperature prior to reaching the stream.
(4) The encroachment shall only be allowed where the applicant demonstrates to the satisfaction of the review agency that the ecological value and condition of the special water resource protection area will be maintained to the maximum extent practicable;	
(5) A conceptual project design meeting shall be held with the appropriate Department staff and Soil Conservation District staff to identify necessary stabilization measures; and	
(6) All encroachments proposed under this section shall be reviewed and approved by the Department prior to approval by the review agency.	
d. A stream corridor protection plan for a waterway subject to paragraph C.8 shall maintain or enhance the current ecological value and condition of the special water resource protection area as defined in paragraph C.8.a.(1) above. In no case shall a stream corridor protection plan allow the reduction of the Special Water Resource Protection Area to less than 150 feet as measured perpendicular to the waterway subject to this subsection.	
e. Paragraph C.8 does not apply to the construction of one individual single family dwelling that is not part of a larger development and is on a lot receiving preliminary or final subdivision approval on or before February 2, 2004, provided that the construction begins on or before February 2, 2009.	
D. Maintenance Plan	
The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with Section 10.	Municipalities should require that maintenance plans be separate documents for ease of municipal use in tracking implementation (see Section 10)..
E. Exemptions	
The following linear development projects are exempt from the ground water recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Sections 4.B and 4.C:	

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1. The construction of an underground utility line provided that the disturbed areas are revegetated upon completion;	
2. The construction of an aboveground utility line provided that the existing conditions are maintained to the maximum extent practicable; and	
3. The construction of a public pedestrian access, such as a sidewalk or trail with a maximum width of 14 feet, provided that the access is constructed of permeable material such as wood chips, unpacked gravel, and porous pavement (See Section 7 for guidance).	
F. Waivers from Strict Compliance	
1. A waiver from strict compliance with the ground water recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Sections 4.B and 4.C may be obtained for the enlargement of an existing public roadway or railroad; or the construction or enlargement of a public pedestrian access, provided that the following conditions are met:	
a. The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;	
b. The applicant demonstrates, through an alternatives analysis acceptable to the review agency, that through the use of nonstructural and structural stormwater management strategies and measures, the option selected complies with the requirements of Sections 4.B and 4.C to the maximum extent practicable;	
c. The applicant demonstrates that, in order to meet the requirements of Sections 4.B and 4.C, existing structures currently in use, such as homes and buildings, would need to be condemned; and	
d. The applicant demonstrates that it does not own or have other rights to areas, including the potential to obtain through condemnation lands not falling under F.1.c. above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of Sections 4.B and 4.C that were not achievable on-site.	
2. A waiver from strict compliance with the requirements of Sections 4.B and 4.C may be issued in those cases where an applicant has demonstrated the inability or impracticality of strict compliance, other than projects addressed under Subsection F.1, with the stormwater management requirements set forth in NJAC 7:8, in an adopted regional stormwater management plan, or in a local ordinance which is as strict as NJAC 7:8. A waiver from strict compliance for such projects can only be obtained if the applicant agrees to undertake a suitable mitigation measure identified in the mitigation section of the municipality's Stormwater Management Plan. In such cases, the Applicant must submit a mitigation plan detailing how the project's failure to strictly comply will be compensated. In cases where a waiver is granted, an applicant should provide mitigation, if possible and/or practical within the same HUC-14 watershed within which the subject project is proposed, or contribute funding toward a regional stormwater control project, or provide for equivalent treatment at an alternate location, or other equivalent water quality benefit, in lieu of implementing the required stormwater control measures on their specific site.	This section emphasizes the importance of the mitigation section of the municipal Stormwater Management Plan. Municipalities should ensure quality mitigation measures by identifying, in as much detail as possible, the mitigation opportunities that will best serve municipal interests. If there is no mitigation plan, the municipality loses a valuable opportunity to improve stormwater management and to address site-specific problems with stormwater management for new construction.

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<i>G. Threatened and Endangered Species</i>	
When habitat for threatened and endangered species (see definition for Environmental Critical Areas in Section 2), is present on a site, stormwater management measures shall be implemented to avoid adverse impacts caused by pollutant discharge, the creation of concentrated flow, or the alteration of recharge;	The absence of a species from the NJDEP Landscape Project database or the Natural Heritage Database, does not waive the need for site-specific assessments or surveys, nor does it preclude the potential for the presence of such species or their habitat.
Section 5: Calculation of Stormwater Runoff and Ground Water Recharge	
A. Stormwater Runoff Calculations	
1. In complying with the design and performance standards in Section 4, the design engineer shall calculate stormwater runoff using one of the following methods:	
a. The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation, NRCS Dimensionless Unit Hydrograph, and appropriate NRCS 24-Hour design storm, as described in the current NRCS National Engineering Handbook Part 630 – Hydrology, and the current Technical Release 55 – Urban Hydrology for Small Watersheds or superceding document; or	
b. The Rational Method for peak stormwater runoff rate calculations and the Modified Rational Method for stormwater runoff hydrograph calculations. Use of the Rational Method and Modified Rational Method are limited to drainage areas of 20 acres or less. Neither the Rational Method nor Modified Rational Method shall be used to calculate runoff volumes for ground water recharge or stormwater runoff infiltration purposes.	The 20 acre limitation on the use of the Rational Method and Modified Rational Method are taken from the NJDEP Stormwater BMP Manual. Neither method qualifies as sufficient for recharge/infiltration analyses.
2. When selecting or calculating runoff coefficients for pre-developed project site conditions using any of the above methods, the project site's land cover shall be assumed to be woods. However, another land cover may be used to calculate runoff coefficients if: 1) such land cover has existed at the site or portion thereof site without interruption for at least five years immediately prior to the time of application; and 2) the design engineer can document the character and extent of such land cover through the use of photographs, affidavits, and/or other acceptable land use records. If more than one land cover other than woods has existed on the site during the five years immediately prior to the time of application, the land cover with the lowest runoff potential (including woods) shall be used for the computations. All pre-developed land covers shall be assumed to be in good hydrologic condition and, if cultivated, shall be assumed to have applied appropriate conservation practices.	
3. In calculating pre-developed site stormwater runoff, the design engineer shall include the effects of all land features and structures, such as ponds, wetlands, depressions, hedgerows and culverts, that reduce pre-developed site stormwater runoff rates and/or volumes.	

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4. In calculating stormwater runoff using the NRCS methodology, the design engineer shall use appropriate 24-Hour rainfall depths as developed for the project site by the National Oceanic and Atmospheric Administration.	
5. In calculating stormwater runoff using the NRCS methodology, the design engineer shall separately calculate and then combine the runoff volumes from pervious and directly connected impervious surfaces within a drainage area.	
6. Calculation of stormwater runoff from unconnected impervious surfaces shall be based, as applicable, upon the Two-Step methodology as described in the Department's current Stormwater Best Management Practices Manual or the NRCS methodology described in the current Technical Release 55 – Urban Hydrology for Small Watersheds.	
B. Ground Water Recharge Calculations	
1. In complying with the design and performance standards in Section 4, the design engineer may calculate ground water recharge in accordance with the New Jersey Groundwater Recharge Spreadsheet (NJGRS) computer program as described in the Department's current Stormwater Best Management Practices Manual. Alternative ground water recharge calculation methods may be used upon approval by the municipal engineer.	Municipalities that have developed their own approach for calculating ground water recharge may wish to substitute for the NJDEP method, if the municipal method allows for determination of site-specific changes.
2. In complying with the design and performance standards in Section 4, the design engineer shall calculate stormwater runoff infiltration volumes in accordance with the USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation, as described in the current NRCS National Engineering Handbook Part 630 – Hydrology and the current Technical Release 55 – Urban Hydrology for Small Watersheds. In addition, the design engineer shall use appropriate 2-Year, 24-Hour rainfall depths as developed for the project site by the National Oceanic and Atmospheric Administration.	
3. When selecting or calculating runoff coefficients for pre-developed project site conditions for ground water recharge or stormwater runoff infiltration calculations, the project site's land cover shall be assumed to be woods. However, another land cover may be used to calculate runoff coefficients if: 1) such land cover has existed at the site or portion thereof site without interruption for at least five years immediately prior to the time of application; and 2) the design engineer can document the character and extent of such land cover through the use of photographs, affidavits, and/or other acceptable land use records. If more than one land cover other than woods has existed on the site during the five years immediately prior to the time of application, the land cover with the lowest runoff potential (including woods) shall be used for the computations. All pre-developed land covers shall be assumed to be in good hydrologic condition and, if cultivated, shall be assumed to have conservation treatment.	

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<p>Section 6: Standards for Structural Stormwater Management Measures</p>	
<p>A. Structural Management Measures</p>	
<p>Standards for structural stormwater management measures are as follows:</p>	
<p>1. Structural stormwater management measures shall be designed to factor into the design the existing site conditions which may cause the measure to fail, have an adverse effect on water quality or quantity, or cause harm or damage to persons or property, including, for example, environmentally critical areas, wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability and texture; drainage area and drainage patterns; existing or former mines; significant land filling; and the presence of solution-prone carbonate rocks (limestone) and related Karst topography.</p>	<p>An attachment to this model ordinance lists site conditions that may affect the design of stormwater management measures. It can be included as guidance to an ordinance or as a checklist for analysis. In this context, “take into account” means the designer shall factor into the design of all BMPs any site condition that may cause the BMP to fail, have an adverse effect on water quality or quantity, or cause harm or damage to persons or property. The proposed BMPs shall be designed in such a manner that it shall not degrade water quality. See attached list of factors, conditions, and circumstances in the appendix.</p>
<p>2. Structural stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning. Trash racks shall be installed at the intake to the outlet structure as appropriate, and shall have parallel bars with one-inch (1”) spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the parallel bars at the outlet structure shall be spaced no greater than one-third (1/3) the width of the diameter of the orifice or one-third (1/3) the width of the weir, with a minimum spacing between bars of one-inch and a maximum spacing between bars of six inches. In addition, the design of trash racks must comply with the requirements of Section 8.B.</p>	
<p>3. Structural stormwater management measures shall be designed, constructed, and installed to be strong, durable, and corrosion resistant. Measures that are consistent with the relevant portions of the Residential Site Improvement Standards at N.J.A.C. 5:21-7.3, 7.4, and 7.5 shall be deemed to meet this requirement. The measures are to be sequenced in the site development process so that erosion control standards are met and so the measure is not compromised or impaired by construction runoff.</p>	
<p>4. At the intake to the outlet from the stormwater management basin, the orifice size shall be a minimum of two and one-half inches in diameter.</p>	
<p>5. Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at Section 8.</p>	

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6. Where tailwater will affect the hydraulic performance of a stormwater management measure, the design engineer shall include such effects in the measure's design.	
B. Guidelines for Management Measures	
Stormwater management measure guidelines are available in the New Jersey Stormwater Best Management Practices Manual and other documents as described in Section 7. Other stormwater management measures may be utilized provided the design engineer demonstrates to the satisfaction of the review agency that the proposed measure and its design will accomplish the required water quantity, ground water recharge and water quality design and performance standards established by Section 4 of this ordinance.	
C. Manufactured Treatment Devices	
1. Manufactured treatment devices may be used to meet the requirements of Section 4 of this ordinance, provided the pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the Department.	
2. Non-verified manufactured treatment devices may also be used for purposes other than underground discharge of stormwater, where such devices provide a clear benefit to stormwater quality or flow control in a manner that facilitates improved nonstructural stormwater management controls on the site, or avoids the need for approval of off-site mitigation. The benefits of proposed non-verified manufactured treatment devices must be proved to the satisfaction of the review agency.	
3. Manufactured treatment devices may be used only where the maintenance plan required by Section 10 ensures that the manufactured device will be properly maintained for its functional lifespan and will be replaced as needed with management measures that are at least as effective as the original manufactured treatment device working in accordance with manufacturers specifications.	
Section 7: Sources for Technical Guidance	
A. Primary Technical Guidance	
Technical guidance for stormwater management measures can be found in the documents listed at 1 and 2 below, which are available from Maps and Publications, New Jersey Department of Environmental Protection, 428 East State Street, P.O. Box 420, Trenton, New Jersey, 08625; telephone (609) 777-1038.	
1. Guidelines for stormwater management measures are contained in the New Jersey Stormwater Best Management Practices Manual, as amended. Information is provided on stormwater management measures such as: bioretention systems, constructed stormwater	Although no specific design standards are included in this ordinance regarding the use of nonstructural stormwater management strategies, municipalities are

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<p>wetlands, dry wells, extended detention basins, infiltration structures, manufactured treatment devices, pervious paving, sand filters, vegetative filter strips, and wet ponds. This document is also available at www.njstormwater.org.</p>	<p>strongly encouraged to obtain Hunterdon County-specific information on the use of these measures from the Hunterdon County Soil Conservation District. In many instances, strong caution should be applied regarding the use of “native vegetation” as encouraged by the NJ Stormwater BMP Manual due to the nature of current geese and deer problems in the County, which can result in poor survival rates. Seeding density and plants chosen should be closely coordinated with the Soil Conservation District as well. Further, caution is needed regarding the sole reliance on nonstructural stormwater techniques to comply with groundwater recharge requirements. Structural measures should be augmented nonstructural techniques where appropriate to meet this requirement.</p>
<p>2. The New Jersey Department of Environmental Protection Stormwater Management Facilities Maintenance Manual, (NJDEP Ocean County Demonstration Study, Stormwater Management Facilities Maintenance Manual, dated June 1989) as amended.</p>	
<p>B. Additional Technical Guidance</p>	
<p>Additional technical guidance for stormwater management measures can be obtained from the following:</p>	
<p>1. The “Standards for Soil Erosion and Sediment Control in New Jersey” promulgated by the State Soil Conservation Committee and incorporated into N.J.A.C. 2:90. Copies of these standards may be obtained by contacting the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey 08625; (609) 292-5540, or the Hunterdon County Soil Conservation District, 687 Pittstown Road, Suite 1, Frenchtown, NJ 08825, (908) 788-1397.</p>	
<p>2. The Rutgers Cooperative Extension Service, 732-932-9306.</p>	
<p>3. The Hunterdon County Soil Conservation District, 687 Pittstown Road, Suite 1, Frenchtown, NJ 08825, (908) 788-1397.</p>	
<p>4. The United States Environmental Protection Agency, including the National Management Measures to Control Nonpoint Source Pollution from Urban Areas, available at the Web site: http://www.epa.gov/owow/nps/urbanmm/index.html.</p>	
<p>5. Field guides of the United States Department of Agriculture, Natural Resources Conservation Service, where supplemental to and not conflicting with a source of Primary Guidance in Section 7.A.</p>	
<p>6. Other similarly authoritative governmental or trade association sources acceptable to the municipality.</p>	

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<p>Section 8: Safety Standards for Stormwater Management Basins</p>	
<p>A. General Scope</p>	
<p>This section sets forth requirements to protect public safety through the proper design and operation of stormwater management basins. This section applies to any new stormwater management basin.</p>	<p>The provisions of this section are not intended to preempt more stringent municipal or county safety requirements for new or existing stormwater management basins. Municipal and county stormwater management plans and ordinances may, pursuant to their authority, require existing stormwater management basins to be retrofitted to meet one or more of the safety standards in Sections 8.B.1, 8.B.2, and 8.B.3 for trash racks, overflow grates, and escape provisions at outlet structures.</p>
<p>B. Requirements for Trash Racks, Overflow Grates and Escape Provisions</p>	
<p>1. A trash rack is a device intended to intercept runoff-borne trash and debris that might otherwise block the hydraulic openings in the outlet structure of a structural stormwater management measure. Trash racks shall be installed upstream of such outlet structure openings to ensure proper functioning of the structural stormwater management measure in accordance with the following:</p>	
<p>a. The trash rack should be constructed primarily of bars aligned in the direction of flow with a maximum bar spacing of approximately ½ the diameter or width of the hydraulic opening it is protecting. Transverse bars aligned perpendicular to flow should be sized and spaced as necessary for rack stability and strength.</p>	
<p>b. The trash rack shall not adversely affect the hydraulic performance of either the outlet structure opening it is protecting or the overall outlet structure.</p>	
<p>c. The trash rack shall have sufficient net open area under clean conditions to limit the peak design storm velocity through it to a maximum of 2.5 feet per second.</p>	
<p>d. The trash rack shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300 lbs/ft sq.</p>	
<p>2. An overflow grate is a device intended to protect the opening in the top of a stormwater management measure outlet structure. If an outlet structure has an overflow grate, such grate shall meet the following requirements:</p>	

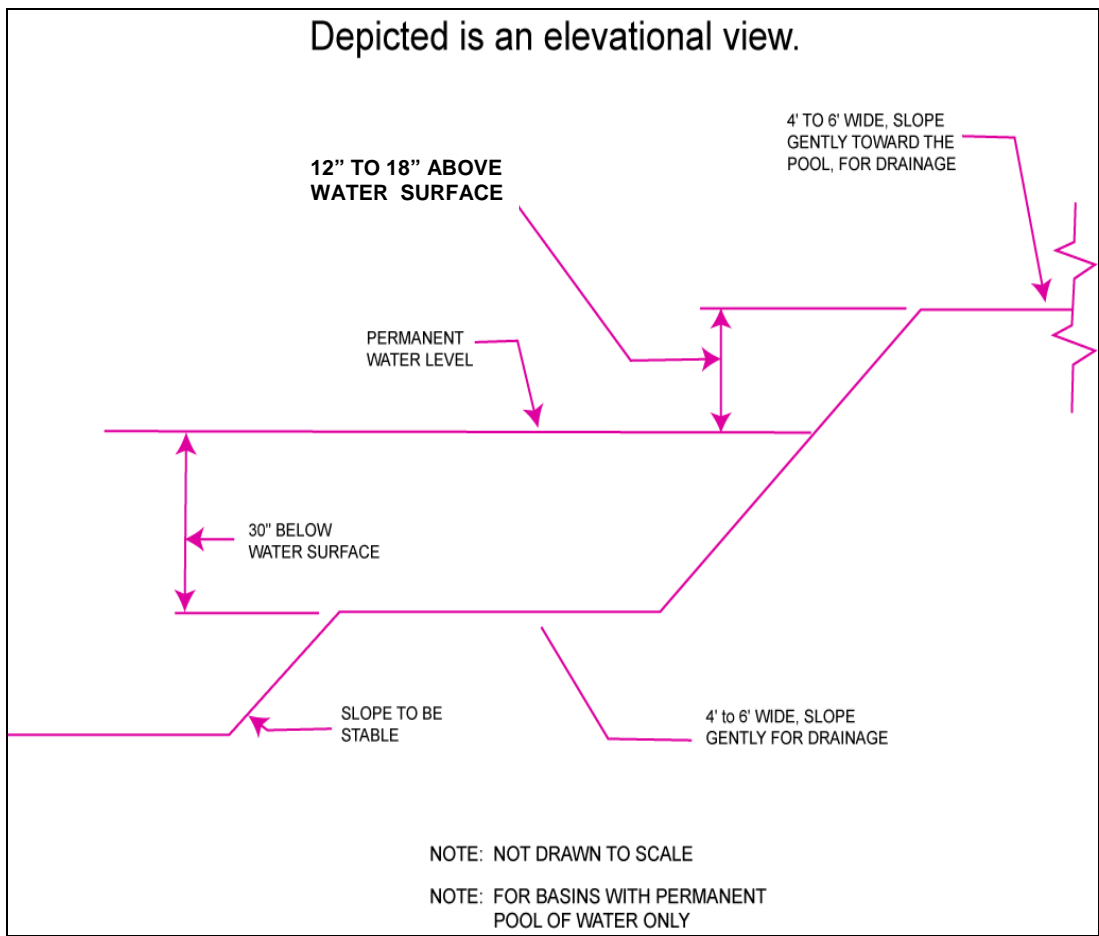
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a. The overflow grate shall be secured to the outlet structure but removable for emergencies and maintenance.	
b. The overflow grate spacing shall be no more than two inches across the smallest dimension.	
c. The overflow grate shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300 lbs./ft sq.	
3. Structural stormwater management measures shall include escape provisions as follows:	At the discretion of the municipality, fences may be required, however, they can create safety issues. For example, small children may be able to get through or over the fence, but adults cannot.
a. If a structural stormwater management measure has an outlet structure, escape provisions shall be incorporated in or on the structure. Escape provisions means the permanent installation of ladders, steps, rungs, or other features that provide readily accessible means of ingress and egress from the outlet structure.	
b. Safety ledges shall be constructed on the slopes of all new structural stormwater management measures having a permanent pool of water deeper than two and one-half feet. Such safety ledges shall be comprised of two steps. Each step shall be four to six feet in width. One step shall be located approximately two and one-half feet below the permanent water surface, and the second step shall be located one to one and one-half feet above the permanent water surface. See Section 8.D for an illustration of safety ledges in a stormwater management basin.	
c. In new stormwater management basins, the maximum slope of the interior and exterior of an earthen dam, embankment, or berm shall not be steeper than 3 horizontal to 1 vertical in accordance with N.J.A.C. 7:8-6(c)3.	Municipalities should consider limiting side slopes to 4:1 or 5:1 for improved safety and maintenance purposes. The 3:1 standard may be more appropriate in situations where insufficient site area is available.
d. An emergency drawdown method for detention basins is required where the permanent pool will be more than two and one-half feet deep. This drawdown method must consider downstream or offsite stability at the outfall in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey.	A drawdown method provides a backup to the primary outlet structure in case of emergency or potential failure of the structure. Further, the drawdown method will allow rescuers easier access to the pond if necessary.
<i>C. Variance or Exemption from Safety Standards</i>	
1. A variance or exemption from the safety standards for stormwater management basins may be granted only upon a written finding by the appropriate reviewing agency (municipality, county or Department) that the variance or exemption will not constitute a threat to public safety.	

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D. Illustration of Safety Ledges in a New Stormwater Management Basin

A stormwater basin that creates an impoundment regulated by the Department under the Dam Safety Act will require a 10-foot berm around the basin, to the extent that a berm is created.



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Section 9: Requirements for a Site Development Stormwater Plan	
A. Submission of Site Development Stormwater Plan	
1. Whenever an applicant seeks municipal approval of a development subject to this ordinance, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section 9.C below as part of the submission of the applicant's application for subdivision or site plan approval.	Refer back to Section 1.C. Applicability.
2. The applicant shall demonstrate through Submission Requirements that the project meets the standards set forth in this ordinance.	
3. The applicant shall submit to the approving municipal authority the required number of copies of the materials listed in the checklist for site development stormwater plans in accordance with Section 9.C of this ordinance.	"Approving authority" defined by MLUL means planning board unless otherwise designated by ordinance
B. Site Development Stormwater Plan Approval	
The applicant's Site Development project shall be reviewed as a part of the subdivision or site plan review process by the municipal board or official from which municipal approval is sought (the review agency). That review agency shall consult the engineer retained by the Planning and/or Zoning Board (as appropriate) to determine if all of the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this ordinance.	
C. Submission Requirements	
The information in 9.C.1 through 9.C.7 below shall be provided unless a waiver is approved through 9.C.8 below:	
1. Existing Site Conditions Base Map, including topography, streams, roads and current built environment The reviewing engineer may require upstream tributary drainage system information as necessary. It is recommended that the topographic base map of the site be submitted which extends a minimum of 300 feet beyond the limits of the proposed development, at a scale appropriate to show site details, showing 2-foot contour intervals.	See attached checklist.
2. Environmental Site Analysis A written and graphic description of the natural and man-made features of the site and its environs. This description should include a discussion of soil conditions, slopes, wetlands, waterways and vegetation on the site. Particular attention should be given to unique, unusual, or environmentally critical areas and to those that provide particular opportunities or constraints for development.	

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<p>3. Project Description and Site Plan(s) A map (or maps) at a scale appropriate for the site indicating the location of existing and proposed buildings, roads, parking areas, utilities, structural facilities for stormwater management and sediment control, and other permanent structures. The map(s) shall also clearly show areas where alterations occur in the natural terrain and cover, including lawns and other landscaping, and seasonal high ground water elevations. A written description of the site plan and justification of proposed changes in natural conditions may also be provided.</p>	<p>Municipalities should make sure that this provision and their existing local requirements for site plan and subdivision submittals are compatible. Municipalities may wish to allow a dual scale 1"=100' for overall view. Any design detail should be shown at no more than 1"=40'. Where slope is critical or precision grading is required the map scale should be 1"=20'.</p>
<p>4. Stormwater Site Planning and Design Summary This plan shall provide a demonstration of how the goals and standards of Sections 3 through 6 are being met, including both nonstructural and structural approaches. The focus of this plan shall be to describe how the site is being managed or developed to meet the objective of controlling ground water recharge, stormwater quality and stormwater quantity problems at the source by land management and source controls whenever possible. Refer to the Municipal Stormwater Management Plan and/or the Municipal Stormwater Pollution Prevention Plan for additional requirements. It should explain in full the maps required by this section.</p>	<p>Note: Municipalities should consider a mandate that the LID Checklist be completed for all projects.</p>
<p>5. Stormwater Management Facilities Map(s) The following information, illustrated on a map at a scale appropriate for the site, shall be included:</p>	
<p>a. Total area to be paved or built upon, proposed surface contours, land area to be occupied by the stormwater management facilities and the type of vegetation thereon, land area to remain in natural vegetation, and details of the proposed plan to infiltrate, manage, control and dispose of stormwater.</p>	
<p>b. Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention, and emergency spillway provisions with maximum discharge capacity of each spillway.</p>	
<p>6. Calculations</p>	
<p>a. Comprehensive hydrologic and hydraulic design and discharge stability calculations for the pre-development and post-development conditions for the design storms specified in Section 4 of this ordinance.</p>	<p>The soil erosion and sediment control plan/construction maintenance plan should be reviewed by the municipal review agency in connection with this provision.</p>
<p>b. When the proposed stormwater management control measures (e.g., infiltration basins) depend on the hydrologic properties of soils, then a soils report shall be submitted. The soils report shall be based on onsite boring logs or soil pit profiles. The number and location of required soil borings or soil pits shall be determined based on what is needed to determine the suitability and distribution of soils present at the location of the control measure. The municipality shall be notified of site investigation activities and given the</p>	<p>The use of a witness to soil investigations is to help ensure proper siting of stormwater measures. The post-construction steps are needed to ensure that the facilities were properly constructed. There will be a varying need for these provisions based on soil types.</p>

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<p>opportunity to have a witness, either prior to approval or as a condition of approval, as appropriate for the specific type of measure. Subsequent to approval of the major development, post-construction bulk soil density and infiltration testing shall be required for all infiltration measures that were used as justification for meeting the recharge standard, to ensure that they were properly constructed.</p>	
<p>7. Maintenance and Repair Plan The design and planning of the stormwater management facility shall meet the maintenance requirements of Section 10.</p>	
<p>8. Waiver from Submission Requirements The review agency may, in consultation with the municipal engineer, waive submission of any of the requirements in Sections 9.C.1 through 9.C.6 of this ordinance when it can be demonstrated that the information requested is impossible to obtain or it would create a significant economic hardship on the applicant to obtain <u>and</u> its absence will not materially affect the review process.</p>	
Section 10: Maintenance and Repair	
A. Applicability	
<p>1. Projects subject to review pursuant to Section 1.C of this ordinance shall comply with the requirements of Sections 10.B and 10.C.</p>	
B. General Maintenance	
<p>1. The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development. This plan shall be separate from all other documents and designed for ongoing use by the site owners or operators in performing and documenting maintenance and repair, and by the municipality in ensuring implementation of the maintenance plan. The final maintenance plan shall be updated and provided to the municipality post-construction to include an evaluation based on the specifications of the initial maintenance plan and as-built conditions.</p>	<p>Municipalities wishing to take responsibility for long term maintenance of stormwater facilities but concerned about the costs of doing so should consider requiring that the developer create a “sinking fund” with sufficient money to ensure that the dividends/earnings from that fund will cover maintenance costs for that facility.</p>
<p>2. The maintenance plan shall contain specific preventive maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal and disposal; safety needs; identification of methods and disposal sites for materials removed during maintenance; maintenance requirements for created wetlands and other ecological systems; safety devices and systems; warranty and operational standards from the manufacturers of any manufactured treatment devices (See Section 6.C); and the name, address, and telephone number of the person or persons responsible for preventive and corrective maintenance (including replacement), using maintenance guidelines for stormwater management measures from Section 7, the Municipal Stormwater Management Plan, Municipal Stormwater Pollution Prevention Plan and any relevant regional stormwater management plan. If the maintenance plan identifies a person other than the developer (for</p>	<p>Information on funding source examples include: The NJDEP Grant and Loan Programs for municipalities authorized under a municipal stormwater general permit - www.nj.gov/dep/grantandloanprograms/er_munst.htm and A Virginia fact sheet on Planning for BMP Maintenance Costs – www.novaregion.org/pdf/Maintaining_BMPs.pdf</p>

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<p>example, a public agency or homeowners' association) as having the responsibility for continuing maintenance, the plan shall include documentation of such person's agreement to assume this responsibility, or of the developer's obligation to dedicate a stormwater management facility to such person under an applicable ordinance or regulation.</p>	
<p>3. Responsibility for maintenance shall not be assigned or transferred to the owner or tenant of an individual property in a residential development or project, unless such owner or tenant owns or leases the entire residential development or project.</p>	<p>Note: Commercial property owners will normally retain responsibility for the stormwater systems within the commercial property.</p>
<p>4. If the person responsible for maintenance identified under Section 10.B.2 above is not a public agency, the maintenance plan and any future revisions based on Section 10.B.7 below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.</p>	<p>This provision is directly from NJDEP's Stormwater Management Rules (NJAC 7:8-5.8(d)). Deed restrictions shall: (a) Clearly specify the particular property at issue (including Block & Lot numbers); (b) Specify that the agreement "runs with the property" and is binding on all successors and assigns; and (c) Is duly witnessed and notarized. Part (a) is required so that the agreement is recorded as affecting that particular property and so that the agreement shows up in a search for documents pertaining to that property in the Book of Records. A sample stormwater maintenance agreement from Los Angeles is attached as an appendix to this model ordinance. In the case of larger maintenance plans, the municipality may wish to consider including a summary in the deed restriction and then a reference to the source of the full plan at the municipal offices.</p>
<p>5. Preventive and corrective maintenance shall be performed to maintain the function of the stormwater management measures, including repairs or replacement to the structures; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; and repair or replacement of nonvegetated linings.</p>	
<p>6. The person responsible for maintenance identified under Section 10.B.2 above shall maintain a detailed log of all preventive and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenance-related work orders.</p>	
<p>7. The person responsible for maintenance identified under Section 10.B.2 above shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed.</p>	
<p>8. The person responsible for maintenance identified under Section 10.B.2 above shall retain, submit annually to the municipality and make available, upon request by any public entity with administrative, health, environmental, or safety authority over the site, the maintenance plan and the documentation required by Sections 10.B.6 and 10.B.7 above.</p>	<p>The municipality can specify submittal of maintenance reports to a specific municipal entity for review, or simply require retention of records that would be made available upon inspection. The maintenance plan and documentation should be retained in the office of the</p>

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	municipal clerk and in the office of the municipal engineer.
<p>9. The requirements of Sections 10.B.3 and 10.B.4 do not apply to stormwater management facilities that are dedicated to and accepted by the municipality or another governmental agency of competent jurisdiction.</p>	<p>It may be appropriate to delete requirements in the maintenance and repair plan that are not applicable if the ordinance requires the facility to be dedicated to the municipality. If the municipality does not want to take this responsibility, the ordinance should require the posting of a two year maintenance guarantee in accordance with N.J.S.A. 40:55D-53. Guidelines for developing a maintenance and inspection program are provided in the New Jersey Stormwater Best Management Practices Manual and the NJDEP Ocean County Demonstration Study, Stormwater Management Facilities Maintenance Manual, dated June 1989 available from the NJDEP (See Section 7).</p>
<p>10. In the event that the stormwater management facility becomes a danger to public safety or public health or is in need of maintenance or repair, the municipality shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have fourteen (14) days to effect maintenance and repair of the facility in a manner that is approved by the municipal engineer or his designee. The municipality, in its discretion, may extend the time allowed for effecting maintenance and repair for good cause. If the responsible person fails or refuses to perform such maintenance and repair, the municipality or County may immediately proceed to do so and shall bill the cost thereof to the responsible person.</p>	<p>Each municipality should carefully consider this provision, and some sort of penalty schedule should be adopted (see Section 11). In addition, a municipality may wish to attach a lien against the property for any maintenance and repair costs incurred under this provision.</p>
<p>C. Nothing in this section shall preclude the municipality in which the major development is located from requiring the posting of a performance or maintenance guarantee in accordance with N.J.S.A. 40:55D-53.</p>	
<p>D. The maintenance plan shall specifically provide a specific municipal right of access for inspection of measures, and for maintenance if required under Section B.10.</p>	<p>Municipalities may desire to use a separate “police power” ordinance to require licensing of all stormwater management facilities that are not dedicated to a public entity, as in Section 10.B.9 above, and to impose a small annual fee to cover the costs of inspection by the designated inspector from the municipality.</p>

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Section 11: Penalties	
Any person who erects, constructs, alters, repairs, converts, maintains, or uses any building, structure or land in violation of this ordinance shall be subject to the following penalties: <i>[Municipality to specify].</i>	
Section 12: Effective Date	
This ordinance shall take effect immediately upon the approval by the county review agency, or sixty (60) days from the receipt of the ordinance by the Hunterdon County Planning Board if the Hunterdon County Planning Board, as county review agency, should fail to act.	
Section 13: Severability	
If the provisions of any section, subsection, paragraph, subdivision, or clause of this ordinance shall be judged invalid by a court of competent jurisdiction, such order of judgment shall not affect or invalidate the remainder of any section, subsection, paragraph, subdivision, or clause of this ordinance.	

SITE CONDITIONS TO BE CONSIDERED FOR A SITE DEVELOPMENT STORMWATER PLAN

In addition to the prescribed information in Section 9: Requirements for a Site Development Stormwater Plan, Part C. Submission Requirements, the following elements should be considered and presented as appropriate and in combinations sufficient to adequately indicate the **existing** site conditions and that of the surrounding environs:

1. Hydrology
 - a. Perennial or intermittent streams as shown on the USGS 7.5 Minute Quadrangle Maps and as indicated in the Soil Survey of Hunterdon County, New Jersey
 - b. Special water resource protection areas along all waters designated Category One at N.J.A.C. 7:9B and perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys
 - c. Wetlands, NJDEP Linear Non-Tidal Wetlands, Marshlands and NJDEP Letter of Interpretation findings
 - d. FEMA Q3 Flood Data 100 Year-Floodplains and Floodways
 - e. Geometry of on-site drainage areas
2. Boundaries and Buffers
 - a. Appropriate buffers to streams, rivers, wetlands, marshlands, ponds, lakes and other water bodies as specified in pertinent "ordinances, rules, regulations, statutes or other provisions of law imposed by local, County, State or Federal agencies"
 - b. Existing and proposed bearing and distances of property lines
 - c. Existing and proposed conservation, maintenance, construction, reconstruction, sight, utility, drainage and right-of way easements and dedications
3. Vegetation and Landscaping
 - a. Pervious and vegetated surfaces, i.e. woodlands, grasslands and other significant natural features not listed if being utilized for LID credit
 - b. Native and invasive stands of vegetation
 - c. Vegetated habitat for Threatened and Endangered Species
4. Geology and Soils (as indicated in the Soil Survey of Hunterdon County, New Jersey)
 - a. Steep slopes, 10% or > slopes
 - b. Soil types
 - c. Highly erodible soils, with an erodibility factor (K) of .40 or <
 - d. Drainage Class and recharge potential
 - e. Colloidal soils
 - f. Depth to bedrock
 - g. Seasonal high water table
 - h. Soils subject to dynamic compaction and compacted soils
 - i. Soil pH
 - j. Shrink swell potential
 - k. Deeply fractured bedrock
 - l. Limestone and karst topography
 - m. Hardpans and plough pans
5. Existing Man Made Structures and Activities
 - a. Existing buildings and significant permanent manmade features
 - b. Roads by classification, parking areas and other impervious surfaces
 - c. Bridges and culverts
 - d. Utilities, sub-surface and above ground
 - e. Mining / quarry operations and blasting areas

- f. Acid or other hazardous runoff
- g. Areas of fill and buried debris
- h. Wellheads and associated ground water withdrawals Pipes, discharges and BMP's of existing stormwater utilities
- i. Groundwater mounding
- j. Septic systems and wells of adjacent lots
- k. Leaking sanitary lines
- l. Previous land use (agricultural, industrial, commercial)

SITE CONDITIONS CHECKLIST

In addition to the prescribed information in Section 9: Requirements for a Site Development Stormwater Plan, Part C. Submission Requirements, the following elements should be considered and presented as appropriate and in combinations sufficient to adequately indicate the **existing** site conditions and that of the surrounding environs:

Y	N	N/A	Hydrology
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Perennial or intermittent streams as shown on the USGS 7.5 Minute Quadrangle Maps and as indicated in the Soil Survey of Hunterdon County, New Jersey
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Special water resource protection areas along all waters designated Category One at N.J.A.C. 7:9B and perennial/intermittent streams that drain into/upstream of the Category One waters as shown on the USGS Quad Maps Soil Survey
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wetlands, NJDEP Linear Non-Tidal Wetlands, Marshlands and NJDEP Letter of Interpretation findings
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	FEMA Q3 Flood Data 100 Year-Floodplains and Floodways
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Geometry of on-site drainage areas

Y	N	N/A	Boundaries and Buffers
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Appropriate buffers to streams, rivers, wetlands, marshlands, ponds, lakes and other water bodies as specified in pertinent "ordinances, rules, regulations, statutes or other provisions of law imposed by local, County, State or Federal agencies"
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Existing and proposed bearing and distances of property lines
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Existing and proposed conservation, maintenance, construction, reconstruction, sight, utility, drainage and right-of way easements and dedications

Y	N	N/A	Vegetation and Landscaping
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pervious and vegetated surfaces, i.e. woodlands, grasslands and other significant natural features not listed if being utilized for LID credit
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Native and invasive stands of vegetation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Vegetated habitat for Threatened and Endangered Species

Y	N	N/A	Geology and Soils (Soil Survey of Hunterdon County, New Jersey)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Steep slopes, 10% or > slopes
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Soil types
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Highly erodible soils, with an erodibility factor (K) of .40 or <
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Drainage Class and recharge potential
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Colloidal soils
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Depth to bedrock
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Seasonal high water table
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Soils subject to dynamic compaction and compacted soils
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Soil pH
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Shrink swell potential
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Deeply fractured bedrock
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Limestone and karst topography
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hardpans and plough pans

Y	N	N/A	Existing Man Made Structures and Activities
			Existing buildings and significant permanent manmade features
			Roads by classification, parking areas and other impervious surfaces
			Bridges and culverts
			Utilities, sub-surface and above ground
			Mining / quarry operations and blasting areas
			Acid or other hazardous runoff
			Areas of fill and buried debris
			Wellheads and associated ground water withdrawals
			Pipes, discharges and BMP's of existing stormwater utilities
			Groundwater mounding
			Septic systems and wells of adjacent lots
			Leaking sanitary lines
			Previous land use (agricultural, industrial, commercial)