MUNICIPAL STORMWATER MANAGEMENT PLAN

THE TOWNSHIP OF TOMS RIVER

Submitted to:

THE TOMS RIVER TOWNSHIP PLANNING BOARD

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STORMWATER MANAGEMENT PLAN
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1.0 INTRODUCTION

This Municipal Stormwater Management Plan (MSWMP) outlines a strategy for Toms River to alleviate stormwater related impacts imposed on the Township through the incorporation of more stringent policies within their Land Use Regulations. Further, pursuant to N.J.A.C. 7:14 Municipal Stormwater Regulations, the New Jersey Department of Environmental Protection has issued a new set of stormwater management regulations pertaining to "Major Development", which includes development or redevelopment that disturbs one or more acres of land. Also included in the plan are proposed ordinance amendments that would incorporate both the goals of this plan and the new stormwater management standards into the existing municipal regulations. This plan will incorporate all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules as well as the nine planning goals that should be addressed when devising municipal level stormwater management plans (N.J.A.C. 7:8-2.2). Further, the plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development proposals. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides baseflow to receiving water bodies.
Also, the proposed amendments and initiatives contained within this plan will incorporate the six control measures proposed to reduce the discharge of pollutants to the maximum extent practicable and protect water quality as outlined within the Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program Rules (N.J.A.C. 7:14A).

To incorporate more stringent stormwater management techniques, initially Birdsall Engineering, Inc. and supplemented by the Tom's River Department of Community Development, has completed a review of Toms River's existing ordinances, its Master Plan, the existing land use regulations, and other planning documents.

2.0 GOALS AND OBJECTIVES

To improve water quality, reduce the risk of flooding, and in turn improve the quality of life for residents of Toms River, the incorporation of more stringent stormwater management techniques has been identified as a priority by both state and local level government agencies. The new stormwater management requirements and best management practices will advance the goals and objectives of both the New Jersey Department of Environmental Protection and Toms River Township itself. A number of goals and objectives stated within the Toms River Master Plan would be advanced by more stringent stormwater management standards. Within the Township's most recent Master Plan, Toms River pledges to "maintain the existing character of much of the Township through the provision of ample open space and preservation of stream corridors." The goals and objectives also identify to "prevent the encroachment on flood hazard areas along streams, rivers, and inland wetlands by buildings or uses, which would be detrimental to the quality of subsurface and surface water supplies" as a priority for the Township. Therefore, the principles and stormwater management methods proposed within this plan are consistent with the objectives of Toms River Township.

The New Jersey Department of Environmental Protection (NJDEP) has established a minimum set of goals and objectives that all municipal stormwater management plans should follow, they include to:

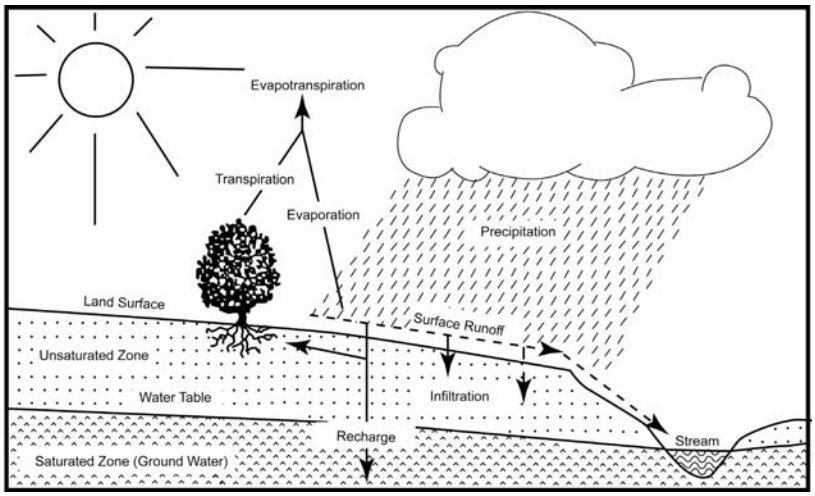
- Reduce flood damage, including damage to life and property;
- Minimize, to the extent practical, any increase in stormwater runoff from any new development;
- Reduce soil erosion from any development or construction project;
- Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
- Maintain groundwater recharge;
- Prevent, to the greatest extent feasible, an increase in nonpoint pollution;
- Maintain the integrity of stream channels for their biological functions, as well as for drainage;
- Minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the state, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial, and other uses of water; and
- Protect public safety through the proper design and operation of stormwater basins.

To achieve these goals, this plan examines the most pressing stormwater related issues facing Toms River, and in turn proposes possible amendments to the Township's design and performance standards to incorporate a more comprehensive code for managing stormwater. By examining the Township's history, demographics, and current conditions concerning water quality, water quantity, and flooding issues, a clearer picture can be

drawn in regards to what the stormwater management issues are at this time, and what type of policy amendments should be taken to improve them. This plan also calls for additional stormwater management regulations to be adopted by the Township in order to ensure that preventative and corrective maintenance strategies have been formulated to ensure the long-term efficacy of stormwater management facilities.

3.0 EFFECTS OF STORMWATER RUNOFF

The hydrologic cycle is defined as the constant cyclical movement of water from the ground to the atmosphere and back to the ground. As illustrated by the figure below, this process includes evaporation, transpiration, evapotranspiration, condensation, transport, precipitation, infiltration, percolation, surface runoff, interflow, and groundwater flow. Land development has a dramatic effect on the natural function of this process.



Prior to development, native vegetation acts to both intercept falling precipitation, and return water that has infiltrated into the ground through evapotranspiration. By clearing vegetation, compacting soil, and replacing it with impervious cover, lawns, or landscaping, the development process serves to reduce the natural rate of water that may infiltrate into the soil, and in turn evapotranspiration.

In developed areas, following a precipitation event, both the volume and the rate of stormwater runoff will increase in proportion to the amount of additional impervious cover generated through a given development. Often gutters, channels and storm sewers, are the tools with which this additional stormwater is carried to local waterways. These man-made stormwater management tools transport water more quickly which causes the stormwater flows in downstream waterways to peak faster and higher than would be produced in a natural state. The increased peak flow during and shortly after a precipitation event produce greater fluctuations between normal and storm flow rates, which can increase channel erosion.

Table 1: The Effect of Impervious Cover on Runoff	
Share of Land With Impervious Cover	Share of Rainwater that Becomes Runoff
0% (natural state)	10 %
10-20%	20%
35-50%	30%
75-100%	55%
Source: NJDEP Planning for Clean Water: The Municipal Guide Trenton, NJ 2000.	

Not only does the development process increase the peak rate of stormwater flows, the addition of impervious cover also results in water pollution. Pollutants carried within stormwater runoff can take the form of nutrients such as nitrogen and phosphorous which encourage the growth of algae in downstream water ways, or trash and oils that accumulate on sidewalks and roadways between precipitation events. In locations where stormwater sewers discharge runoff directly into a stream, the aggregate accumulation of sediment and pollutants that are carried within it are dumped directly into local waterways. In addition to the chemical and physical contaminants, runoff from impervious systems also requires another form of pollution, heat. When rain falls on pavement that has collected heat through the day, the temperature of runoff can reach as high as 83 degrees Fahrenheit, which is sufficiently warm enough to damage sensitive plant and animal species. Table 2 below, includes a comprehensive list of the possible pollutants contained within untreated stormwater flows.

Table 2: Pollutants Carried in Stormwater
The following pollutants collected and carried in stormwater runoff can seriously degrade water quality in the community:
Nutrients- Include nitrogen and phosphorous, which plants need to grow. However, high levels can cause a health hazard in drinking water and stimulate excessive aquatic plant growth, which can ultimately lower dissolved oxygen levels in the water, causing fish and other aquatic life to smother. Algae blooms are examples of how excess nutrients pollute. Sources of excess nutrients include animal waste, fertilizers, septic systems, road salt applications and auto emissions. About half of the fertilizers applied to lawns in the New Jersey coastal zone enter streams and head to the bay and ocean.
Pathogens- Are disease causing bacteria and viruses associated with the presence of fecal matter. They affect human health directly when people contact contaminated water and consume shellfish. Sources include failing septic systems, animal waste, and boat sanitation facilities.
Sediment- Is fine particles of eroded soil or sand. Common origins are concentrated, excessive stormwater runoff from construction sites. Sediment smothers aquatic habitat, carries pollutants bound to soil particles, makes water cloudy and inhibits the breeding and movement of aquatic species.
Toxic Contaminants- Include pesticides as well as heavy metals such as copper, lead and zinc which are commonly found in old paint, tires, lawn chemicals and preservatives. They attach to sediments, resist breakdown, accumulate in organisms and represent threats to the food chain.
Debris- Consists of various items of trash, such as old tires, shopping carts and plastics. It comes from illegal dumping, street litter, and boating waste. It threatens aquatic life and detracts from recreational and aesthetic values.
Oil- Is one of the worst offenders. One gallon of oil dumped down a storm drain can create a slick up to 8 acres and may pollute up to 1 million gallons of water.
Thermal Stress- From elevated water temperatures reduces survival rates and disease resistance of valued native species and allows the spread of non-native (exotic) species. Water temperature rises because of increased pavement near streams, loss of vegetated stream buffers and stream channelization.
Source: Association of New Jersey Environmental Commissions (1998, Spring). *ANJEC Report*

4.0 CURRENT CONDITIONS

4.1 SETTING

Situated in the eastern portion of Ocean County, south of Brick Township and west of Barnegat Bay, is the Township of Toms River, incorporated in 1767. It is host to the County Seat located in Toms River, and is known synonymously as Toms River Township and Toms River. The Township is serviced by Route 37 and is proximate to Six Flags in Jackson Township as well as many County parks, including its own Cattus Island County Park. Toms River Township is home to the Ocean County and Toms River Maritime

Museums, as well as historic downtown Toms River, complete with shops, restaurants and ocean views.

Since World War II and particularly since the opening of the Garden State Parkway in the mid 1950's, the township has been a focal point for growth. This growth transformed the Township of Toms River from an isolated rural and resort community to a major growth center in the rapidly developing urban corridor between Boston and Washington. The Township has consistently ranked as one of the fastest growing communities in the state of New Jersey, and in fact was the fastest growing community in the decade of the 1970's. The Township also boasts beautiful clean beaches and recreational facilities to be enjoyed by residents, visitors and tourists alike.

4.2 DEMOGRAPHICS

The Township of Toms River, located in the eastern portion of Ocean County, has a land area of 40.97 square miles, and contained 94,660 residents as of the 2005 census. The Township's housing stock is comprised primarily of single-family and multi-family homes, 38.8% and 48.5% respectively; accordingly, the owner-occupied housing units outnumber the renter-occupied units.

In 2005, Toms River's resident population was 94,660, an increase of over 49,000 people since 1970. Though the population has been steadily increasing since 1970, the growth rate has seen a steady decline as the amount of developable land decreases. According to a study prepared by Rutgers University, ("Measuring Urban Growth in New Jersey: A report on recent land development patterns utilizing the 1986 – 1995 NJDEP land use / land cover dataset," by Hasse and Lathrop CRSSA, Rutgers University, 2001), as of 1995, there were approximately 6,866 acres of developable land in the Township. The North Jersey Transportation Planning Authority (NJTPA) forecasts continued population growth to the year 2015 with Toms River reaching a population of just under 100,000. The Township demonstrates a population density of 2,310.4 persons per square mile, a density that surpasses that of Ocean County (803 p/sm), and the State of New Jersey as a whole (1,134 p/sm).

Table 3:Toms River Township Population Characteristics

Year	Population	% Change
1970	43,751	N/A
1980	64,455	47.3%
1990	76,371	18.5%
2000	89,706	17.5%
2005	94,660	4.2%

Source:
1.Ocean County Department of Planning: *Cross Acceptance- Final Report*, February, 2005. http://www.co.ocean.nj.us/planning/stateplan/11_TOMS RIVER_TWP.pdf
2. Ocean County Data Book – June 2007, 14th Addition

4.3 WATERWAYS

OVERVIEW

Toms River Township features a number of waterways including the Toms River, Silver Bay, Kettle Creek, and Long Swamp Creek; among others, all of which function within the confines of the larger Barnegat Bay watershed.

BARNEGAT BAY

The Barnegat Bay Estuary covers over 42 miles of shoreline from the Point Pleasant Canal to Little Egg Harbor Inlet and is protected from the open ocean by a system of barrier beaches and dunes. The flow of fresh water from rivers, creeks and groundwater into the Bay produces the special conditions that are important for the survival of crabs, fish, birds and other wildlife. This water comes from areas inland from the coast but still affects the quality of the Bay waters. The Bay's watershed is a 660 sq. mile area, which encompasses all of the land and water in Ocean County, as well as parts of Monmouth County. It stretches to the east as far as the barrier islands and extends to the west as far as Plumsted Township. Further, the watershed is bounded on the north by Point Pleasant Canal and on the south by Little Egg Harbor Inlet. The watershed varies from coastal dunes and marshes (much of which have been heavily developed) to interior pine barrens habitats protected from extensive development within the Pinelands.

Water quality degradation in the Barnegat Bay estuary is primarily caused by nonpoint sources of pollution. The physical nature of the estuary makes it vulnerable to degradation. Its shallow water depths, relatively small amount of freshwater input from tributaries, and limited connection to the ocean cause a long residence time for pollutants that are harmful to plant and aquatic life.

Impacts have included the loss of commercial and recreational fishing opportunities, closed shellfish harvesting waters and swimming areas, and oxygen-depleting algal blooms and subsequent fish kills. According to the Barnegat Bay Estuary Program's 1999 Characterization Study (BBEP, 1999), two high priority management issues for the estuary relate to nutrient loading and pathogens that are closely coupled with development and associated activities in the watershed, such as deforestation and construction, lawn and garden maintenance, and malfunctioning septic systems. Atmospheric deposition contributes substantially to nutrient input and stormwater discharges deliver significant concentrations of coliform bacteria.

Another relatively recent pollution problem is the population explosion of Canadian geese, which directly contribute fecal matter to surface waterbodies that discharge to the estuary. Major impacts of nutrient over enrichment (eutrophication) include

increased phytoplankton production and biomass, algal blooms, elevated water column turbidity, a decline in biodiversity, and dissolved oxygen depletion. Excessive nutrient input may shift primary production from an eelgrass-dominant system to a phytoplankton and seaweed dominant system. High coliform bacteria levels directly impact water quality and adversely affect human uses of the estuary, including shellfish harvesting, swimming, and boating.

TOMS RIVER

The Toms River is the largest river within the Barnegat Bay watershed. The rivers approximately 200 square mile drainage area, which includes portions of 4 municipalities in both Ocean and Monmouth Counties, composes approximately one third of the total area within the Barnegat Bay Watershed. The river has a very slight gradient, as the river rises only 6.5 feet per mile. Also, the Toms River exhibits a meandering, dendritic pattern, a feature that is characteristic of slow flowing rivers. As a result, there is a wide band of marshy and poorly drained land adjacent to the River.

Completed in 2003, The Toms River Township Recreation Master Plan indicates that through land acquisition and by limiting development within Winding River, and Riverwood Park, which extend a total of four miles along the river, that the Township has already protected large portions of the Toms River and its adjacent stream corridor. However, additional conservation area opportunities exist northwest of Riverwood Park along the Toms River to the Manchester Township border. Through land acquisition and/or obtaining conservation easements, the Township is strongly encouraged to continue to proactively preserve the remaining three miles of the Toms River and its stream corridor from Route 70, east to the Garden State Parkway.

The estuarine portions of the Toms River are listed as impaired under the EPA 303(d) listing for fecal coliform. These impairments cause periodic beach closings at the bathing beaches adjacent to the mouth of Long Swamp Creek. In the summer of 2000, the beaches were closed 3 times for elevated fecal coliform levels. The United States Environmental Protection Agency (EPA) has approved, but not yet adopted a TDML for the Toms River at two testing sites along the River.

LONG SWAMP CREEK

Long Swamp Creek is a small stream located entirely within Toms River Township. The Creek has known water quality impairments and is a recognized contributor of NPS (Non-Point Source Pollution) Priority Pollutants to the Barnegat Bay Estuary.

The Long Swamp Creek Watershed covers an area of approximately 6.3 square miles. Its northernmost boundary is coincident with North Maple Avenue. A 4.5-mile defined streambed exists throughout the lower 2/3 of the watershed, and

receiving water body for the Creek is the estuarine portion of the Toms River. Strictly speaking, it may be considered part of the 192 square mile Toms River watershed basin; however, it is more appropriately defined as a direct contributor to the Barnegat Bay Watershed. The Long Swamp Creek watershed is heavily developed with primarily residential and commercial properties. In fact, it is the most heavily developed watershed contributing to Barnegat Bay.

This distribution is indicative of a Toms River Township development trend that saw urbanization begin in areas closest to the Toms River and then progress away from the river as the availability of river-proximate development parcels became limited.

4.4 WATER QUALITY

Changes in Toms River's landscape have increased stormwater runoff volumes and pollutant loads to waterways that flow through the Township. Environmental concerns have brought about the development of studies, programs and networks intended to monitor the health of waterways and aid in determining methods to mitigate pollution where encountered. Among many programs, the New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the health of the State's waterways. There are now over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified as "non-impaired", "moderately impaired", or "severely impaired" based upon a standardized inspection process. The data is used to generate a New Jersey Impairment Score (NJIS). According to these scores, the waterway is then classified as "non-impaired", "moderately impaired", or "severely impaired". These designations are determined by the following criteria:

Table 4: New Jersey Department of Environmental Protection AMNET Program Waterway Classification Criteria

Non-Impaired	Benthic community comparable to other undisturbed streams within the region. A community characterized by a maximum taxa richness, balanced taxa groups and good representation of intolerant individuals.
Moderately Impaired	Macroinvertebrate richness is reduced, in particular EPT taxa. Taxa composition changes result in reduced community balance and intolerant taxa become absent.
Severely Impaired	A dramatic change in the benthic community has occurred. Macroinvertebrates are dominated by a few taxa that are very abundant. Tolerant taxa are the only individuals present.

Source: New Jersey Department of Environmental Protection Bureau of Freshwater and Biological Monitoring (NJDEP/BFBM): *http://www.state.nj.us/dep/wmm/bfbm/*. Accessed: March 30, 2005.

Based on AMNET data, Toms River ranges from “non-impaired” to “moderately impaired”. Within Toms River, testing results for the Toms River at Route 571 qualified that location as “non-impaired”. A second site on the Toms River, at Oakridge Parkway also resulted in a “non-impaired” designation. Also, upstream of Toms River, Kettle Creek at New Hampshire Ave in Lakewood Township was deemed “moderately impaired” according to AMNET parameters.

In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the state. The New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d) (Integrated List) is required by the federal Clean Water Act to be prepared biennially and is a valuable source of water quality information. The integrated list is divided into five different sublists. The following table illustrates how those sublists were determined:

Table 5: New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d) Integrated List) Sublist Criteria	
Sublist 1	Attaining a water quality standard and no use is threatened.
Sublist 2	Attaining some of the designated uses; no use is threatened; and insufficient or no data and information is available to determine if the remaining uses are attained or threatened.
Sublist 3	Insufficient or no data and information to determine if any designated use is attained.
Sublist 4	Impaired or threatened for one or more designated uses but does not require the development of a TMDL. (Three Categories). 1.TMDL has been completed. 2.Other enforceable pollution control requirements are reasonably expected to result in the attainment of the water quality standard in the near future. 3. Impairment is not caused by a pollutant.
Sublist 5	The water quality standard is not attained. The waterbody is impaired or threatened for one or more designated uses by a pollutant(s), and requires a TMDL.
Source: New Jersey Department of Environmental Protection: http://www.state.nj.us/dep/wmm/sgwqt/wat/integratedlist/integratedlist2004.html. Accessed March 30, 2005	

Water Quality Testing Results of Waterways in Toms River Township That Were Included in the New Jersey 2004 Integrated List of Waterbodies

Sublist	Watershed Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
3	Atlantic Coast	13	Toms River at S Hope Chapel Rd (Rt 547) in Jackson	AN0523	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Toms River Estuary	R11; Toms River Estuary-1; Toms River/Barnegat Bay-2	Dissolved Oxygen, Fecal Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring, 304(l)
5	Atlantic Coast	13	Toms River Estuary	Toms River Estuary-1; Toms River/Barnegat Bay-2	Total Coliform, Arsenic, Copper, Lead, Nickel, Zinc	NJDEP Coastal Monitoring, Shellfish Monitoring, 304(l)
3	Atlantic Coast	13	Toms River near Toms River	01408500, 01408300, 13-TOM-1	Arsenic, Cadmium, Mercury	NJDEP/USGS Data, Metal Recon
1	Atlantic Coast	13	Toms River near Toms River	01408500, 01408300, 13-TOM-1	Phosphorus, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Chromium, Copper, Nickel, Selinium, Zinc	NJDEP/USGS Data, Metal Recon
4	Atlantic Coast	13	Toms River near Toms River	01408500, 01408300, 13-TOM-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
5	Atlantic Coast	13	Toms River near Toms River	01408500, 01408300, 13-TOM-1	pH, Lead	NJDEP/USGS Data, Metal Recon
3	Atlantic Coast	13	Kettle Creek at New Hampshire Ave in Lakewood	AN0515	Benthic Macroinvertebrates	NJDEP AMNET
1	Atlantic Coast	13	Kettle Creek-Tidal	R09, 1614	Dissolved Oxygen	NJDEP Coastal Monitoring, Shellfish Monitoring
5	Atlantic Coast	13	Kettle Creek-Tidal	R09, 1614	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring

Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDL's are needed. A Total Maximum Daily Load (TMDL) is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and non-point sources, which interfere with stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems and other BMP's.

Toms River and Kettle Creek were both listed on The New Jersey 2004 Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(b)) issued in June of 2004. The results of water quality testing analysis indicate that the Toms River does

not attain water quality standards for pH, and lead. Also, estuarine portions of the Toms River do not meet water quality standards for the following pollutants: total coliform, arsenic, copper, lead, nickel, and zinc. In addition, like the Toms River Estuary, Kettle Creek also fails to meet water quality parameters for total coliform. See table on previous page for in depth information relating to New Jerseys 2004 Integrated List.

As tributaries of the Barnegat Bay, a C-1waterbody, certain HUC 14 subwatersheds within Toms River Township have been designated as Special Water Resource Protection Areas (SWPRA). Specifically these subwatersheds are: Kettle Creek, below Lake Rivera outlet (HUC 14 Unit Code 02040301050020), the Barnegat Bay northern tributaries from Tide Creek to Route 37 (HUC Unit Code 02040301050040), and the lower Toms River subwatershed below Route 166 (02040301080090). The delineations of these HUC 14 areas, as well as the rest of the HUC 14 areas within Toms River Township are illustrated in Figure 2-Wetlands Map within this report. As SWRPA's, these waters are already subject to the more stringent stormwater management regulations pursuant N.J.A.C. 7:9B. These regulations require 300-foot buffers and additional best management practice techniques to be incorporated into new development that takes place within the aforementioned HUC-14 boundary areas. As illustrated through Figure 2-Wetlands Map, a significant portion of the eastern half of Toms River Township is already subject to these more stringent regulations.

Toms River Township, Toms River, and the Barnegat Bay watershed in general will continue to experience intense pressure to develop land. As land development and in turn impervious cover continues to increase, stormwater related issues such as maintaining water quality, reducing impervious cover, and improving groundwater recharge will become even more crucial in order to attain the goals and objectives of both state and local governmental agencies.

With regard to TMDL's, based on the fact that that the aforementioned waterways are exhibiting habitat damage, the Sate is required to prepare a Total Maximum Daily Load (TMDL) for each of the affected waterways.

As of this time, TMDLs are approved but have not yet been adopted for the aforementioned stream segments. Once the State (NJDEP) has adopted a TMDL standard, Toms River Township will be required to follow an implementation plan to hopefully lower the level of pollutants in these waterways so as to bring each waterway back into compliance with the appropriate water quality standard.

In the mean time, the Township will continue to do what it can to improve water quality from it's current conditions by way of implementation of holistic solutions such as:

- Implementation of a Pet Waste Ordinance;
- Implementation of the attached Stormwater Management Ordinance;
- Public education such as the inlet labeling program;
- Sanitary Sewer & Public Water Installation Projects;
- Implementation of an Illicit Discharge Elimination Ordinance;
- Sanitary sewer monitoring and maintenance via the Toms River MUA;
- Truck Washout Facilities;
- Street Sweeping Program.

Soil Erosion

The Township of Toms River has recently enlisted the services of the Ocean County Soil Conservation District to regulate causes of soil erosion. As such land disturbance over 5,000 square feet will require a soil erosion and sediment control plan.

In an effort to reduce total suspended solids that are caused by soil erosion, Tom's River Township will, as part of it's engineering inspection duties for land development projects, will report non compliance of the approved Soil Erosion & Sediment Control Plan. If a site is observed by the Ocean County Soil Conservation District, which is the lead agency for monitoring soil erosion, may impose fines for non compliance.

4.5 WATER QUANTITY

The portions of Toms River that are affected by excess stormwater flows extends beyond the floodplains since many of the existing structural stormwater management facilities cannot sustain the flow of water created from severe storm events. As many of the culverts within the Township were designed for different hydrologic conditions (i.e.-less impervious cover), during storm events the existing facilities do not have adequate capacity, thereby causing a backwater effect and increased flooding upstream. The increased amounts of water result in stream bank erosion, under-cutting, scouring, overbank erosion, habitat loss and degradation of roadways and bridge crossings. Through the adoption of more stringent stormwater management regulations, and the development and incorporation of a mitigation plan into these policies, a coordinated systematic system of retrofitting and reconstruction to improve stormwater flooding and quality management will emerge.

With respect to potable water supplies, Toms River Township is serviced by four separate public water supply systems. United Water Toms River is franchised to supply potable water to all of the mainland areas within Toms River Township. The franchise area of the United Water Toms River also includes the Borough of South Toms River, Holiday City at Berkeley, and Silver Ridge Park in Berkeley Township.

However, three other suppliers provide water, mainly on the barrier island sections of the Township. Additional information related to these systems is illustrated through Table 6 below:

Table 6: Toms River Township Public Water Supply

Company	Water System	Population Served in Toms River Twp.	Sources	Supplier
United Water	Toms River System	70,875	24 Wells 1 Purchased Groundwater Source	Manchester Township Municipal Utilities Authority
New Jersey American Water Company	Ortley Beach System	4,918	5 Wells 1 Purchased Groundwater	Seaside Heights Water Department and Lavallette Water Department
New Jersey American Water Company	Pelican Island System	50	1 Purchased Groundwater	Seaside Heights Water Department
New Jersey American Water Company	Ocean County System	11,805	5 Wells 1 Purchased Groundwater	NJAWC-Monmouth System

Source: NJDEP- Source Water Area Protection Program "Source Water Assessment Reports-Toms River Township" December 2004 Accessed: May 11, 2005: http://www.state.nj.us/cgi-bin/dep/swap/swapdata.pl

As the majority of the Township's potable water supply is served via wells, both present and future contamination of the Township's groundwater is of special concern. This concern stems from water extraction past the aquifers sustainable yield, and the consequent saltwater intrusion that threatens the aquifer if this process continues. Therefore, the minimization of impervious coverage through the incorporation of more stringent stormwater management regulations can both decrease the demand for potable water and maximize groundwater recharge.

The Township's 2002 Master Plan Reexamination that United Water-Toms River (UWTR) is currently undertaking a capital investment program to provide more wells, a biological iron removal plant, and a ground storage tank to handle the increasing demands of development on potable water supplies. The current undertakings will increase source capacity to 29.5 MGD, which will allow the company to meet peak day demands beyond 2005. Annual demand for water in the Toms River Township area is

characterized by two typical demand patterns. A winter-time demand pattern generally occurs from October through mid-May of the year. Peak-demand conditions, generally occur during the summer season from the end of May through September of the year.

The mapping of wellhead areas in Toms River is shown in Figure 6 (Wellhead Protection Areas Map). According to the NJDEP, "A Well Head Protection Area (WHPA) in New Jersey is a map area calculated around a Public Community Water Supply (PCWS) well that delineates the horizontal extent of ground water captured by a well pumping at a specific rate over a two, five, and twelve-year period of time for unconfined wells. The confined wells have a fifty foot radius delineated around each well serving as the wellhead protection area to be controlled by the water purveyor in accordance with Safe Drinking Water Regulations" (see NJAC 7:10-11.7(b) 1). Well Head Protection Area delineations are conducted in response to the Safe Drinking Water Act Amendments of 1986 and 1996 as part of the Source Water Area Protection Program (SWAP). The delineations are the first step in defining the sources of water to a public supply well. Within these areas, potential contamination will be assessed and appropriate monitoring will be undertaken as subsequent phases of the NJDEP SWAP program.

The Wellhead Protect Areas Map (Figure 6) indicates that the NJDEP has mapped twenty one public supply wells in Toms River Township. Eighteen of these supply wells are owned by United Water of Toms River, two supply wells are owned by Roberts Mobile Home Park, The last mapped public supply well is owned by NJ American Water Co.

4.6 FLOODING AND FLOODPLAINS

Several areas of Toms River Township are located in what the Federal Emergency Management Agency (FEMA) considers to be a flood hazard area. These areas are typically adjacent to or in proximity of, The Barnegat Bay, Toms River, Long Swamp Creek, Silver Bay, Polhemus Creek and the Atlantic Ocean.

Most of the developed mainland areas east of Fischer Boulevard and east of Hooper Avenue in the Silverton section of the Township have an elevation below the100-year flood level of the Barnegat Bay, which is 6.6 feet above mean sea level. The beach areas of the Township west of Route 35 northbound are also on land below the 100-year flood level of Barnegat Bay. In addition, the Toms River, east of Main Street is tidal. Developed areas adjacent to the Toms River, which have land elevations below the 100 year flood level, include portions of Gilford Park, areas at the mouth of Long Swamp Creek, Point O' Woods and areas on the south side of Water Street and Brooks Road. Storm drainage lines installed within these areas are generally below high tide levels, which reduce their capacity to discharge storm water. Drainage improvements have recently been installed in the Ortley Beach and the Silverton section of the Township. Through their Capital Improvement Program, Toms River

Township provides for the installation of drainage improvement in other areas of the Township that are located on land below the 100-year flood level.

For the most part, flooding occurs during and after hurricanes, tropical storms and northeasters because of heavy rainfall combined with strong winds, saturated ground and high tides of long duration. To inform both public and private land use decision makers of areas that are subject to flooding, the Federal Emergency Management Agency has completed Flood Insurance Rate Maps (FIRM) for the Township of Toms River. A map of the neighborhoods within flood hazard areas can be viewed at the Toms River Township Engineering Department. Township employees will assist and answer questions, but cannot provide flood zone determinations over the phone. A written flood zone determination, if required, can be obtained by submitting a written request indicating the property location, block and lot, along with a check for $10.00 made out to the Township of Toms River.

4.7 EXISTING AREAS OF FLOODING & PROPOSED SOLUTIONS

Many of the older areas of Toms River, like the Toms River section, residential developments to the south of Lakehurst Road, and the Gilford Park section of Toms River were constructed with inadequate drainage facilities. Subsequently, these areas are frequently subject to flooding from stormwater flows following heavy precipitation events. Recently, the construction of the Hickory Manor detention basin has helped relieve the drainage problems in a portion of the Toms River section of Toms River.

However, several sections of Toms River Township continue to experience flooding problems from “average” storm events. These areas, which were identified by the Stormwater Management subcommittee of the 2005 Toms River Township Master Plan include:

- Multiple areas of Barrier Island
- The lower part of Money Island along the river
- The Gilford Park area (south of Rt. 37)
- The Gilford Park area (north of Rt. 37) from Fischer Blvd. west to Vaughn Ave.
- Windsor Park east of Fischer Blvd. to Bay Ave.
- The Shelter Cove area
- Snug Harbor area lagoons backup into streets via outfall lines
- Various streets within downtown area
- Sections of both Silverton and Green Island
- Many areas in the north end of town

A major issue when attempting to alleviate the threat of flooding is the fact that the state, the county, and Toms River Township all maintain properties in the area, many of which are adjacent to one another. As such, although one agency may correct flooding issues within their jurisdiction, ultimately, they may not be able to alleviate the

problems experienced on adjacent properties that are controlled by another agency. To effectuate successful mitigation strategies, public agencies at both the local and state level must communicate and coordinate their efforts to address stormwater management problems.

To alleviate flooding concerns in these areas, mitigative measures will be explored by the Township engineer, and developed into a hierarchy of mitigating alternatives, which may be included in the Township's Mitigation Plan. Although instances of flooding still occur, Toms River is continuously working to both monitor and correcting existing areas of flooding throughout the Township. The Township actively addresses drainage and flooding issues and they arise and are reported by residents. Also, the Department of Public Works routinely vacuums inlets known prone to flooding and clears away fallen leaves during the autumn months. In addition, each year, the Township includes drainage improvements as part of their Capital Improvement Program. Most of the reported flooding and drainage problems have been corrected. As flooding issues and strategies are more thoroughly addressed, the MSWMP will be amended to incorporate a list of areas that experience flooding due to stormwater management flows.

4.8 PINELANDS JURISDICTIONAL AREAS

The majority of the Township lies outside of the Pinelands Management Area. However, a relatively small portion of the Township lies within the Pinelands Management – Regional Growth Area. This area is situated in the northwesterly most portion of the Township – See Figure 11. These areas will be under the jurisdiction of the Toms River Township Pinelands Stormwater Management Ordinance.

It should be noted that different design standards shall apply to Pinelands & Non-Pinelands jurisdictional areas. The Township has two separate stormwater management ordnances for each jurisdictional area.

4.9 CAFRA

The majority of the Township lies within the jurisdiction of the Coastal Area Facilities Review Act (CAFRA). The CAFRA (NJAC 7:7E) rules incorporate the Stormwater Management Regulations (NJAC 7:8) by reference. Is should be noted that any project that requests relief from the performance standards of this plan and it's associated ordinance may still be subject to mitigation by as mandated by NJDEP/ CAFRA .

5.0 INFRASTRUCTURE

Toms River Township receives almost 46 inches of rain in an average year. To manage the public risk that flooding imposes on residents, a substantial stormwater

management system has been developed. As illustrated earlier through Table 2, the pace, amount, and condition of the water that finds its way into local waterways is in large part determined by the amount of impervious cover the land contains. With less absorption of rainwater into the ground, the increased runoff moves faster and collects more pollutants from the surface, which promotes erosion, damages stream banks, and in turn dumps sediment into streambeds.

N.J.A.C. 7:8 spells out guidelines for how to manage stormwater more effectively and also how to incorporate best management practices into the planning stages of project design. These standards now require stormwater detention capacity to hold and slowly release the runoff from storms that have a likelihood of occurring once every two, ten and one hundred years. Some sites may be able to achieve these standards through vegetative swales, and buffers, and landscaping to control non-point source pollution. Other sites may require the building of a stormwater basin. In these cases, where the development of structural stormwater facilities is necessary, the New Jersey Department of Environmental Protection's BMP guide should be consulted as it outlines alternatives and strategies to incorporate non land-intensive Best Management Practices into a projects site design. The potential alternatives include surface structures including Infiltration Basins, Pervious Paving Systems, and Sand Filters as well as subsurface measures such as Vegetative Filters. The incorporation of such designs into the existing stormwater management infrastructure is strongly encouraged to enhance groundwater recharge, and reduce the space and amount of runoff that originates on site; thus improving both the quality and quantity of stormwater that originates within the Township.

Also, Low Impact Development techniques, which coincide with the goals and functions of Stormwater Management BMP's, include additional means to promote the goals stated within this Municipal Stormwater Management Plan. When practical, incorporating such techniques as maximizing the amount of pervious land to be preserved, utilizing native vegetation for replanting, adding curb cuts to detain and filter stormwater, and using vegetated buffers are also encouraged.

5.1 STORM DRAINS

Toms River Township has an annual Capital Improvement Program through which infrastructure improvements are designed and constructed. The construction or reconstruction of drainage best management practices, and stormwater management improvements, such as the installation of perforated pipe and sump inlets within the Township are included in this program.

Also, Toms River will update outfall mapping that was previously completed under the Sewage Infrastructure Improvement Act (SIAA). The Toms River Township Department of Community Development will investigate each outfall and identify and map each new outfall location during these investigations. Once all the outfall pipes are identified, a GIS map will be developed displaying each outfall pipe location with

alphanumeric identifiers. All water bodies that receive outfall pipe discharges will also be identified on the map. To complete this undertaking, the Township has been divided into two sections. Sector One, which is composed of the areas of Toms River located west of Hooper Avenue will be completed by the interim deadline of April 1,2007. Sector Two, which covers the areas of Toms River east of Hooper Avenue, including the barrier island, will be completed by April 1, 2009. Through the future, as new development and/or redevelopment changes the current storm sewer system through the creation of new outfalls, these maps will be updated accordingly. In addition, all storm drain inlets along municipal streets with sidewalks, and all drain inlets within plazas, parking areas or maintenance yards that are operated by Toms River Township will be labeled. The Toms River Township Department of Community Development will implement the storm drain inlet labeling program.

Toms River Township will also investigate the storm drains for illicit connections and will check outfall pipes for signs of scouring. All storm drain locations will be placed on a prioritized list and repairs will be made in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey. Repairs that do not need NJDEP permits may be completed first.

Outfall pipes in which scouring had been detected and addressed in the past should be inspected annually thereafter to ensure that the associated stabilization projects were successful. Once it is determined that the scouring repairs have adequately mitigated any subsequent scouring, those outfalls will again be inspected once during each five year permit cycle. Outfall pipes that are found to have dry weather flow or evidence of an intermittent non-stormwater flow will be investigated to locate the illicit connection. In addition, if the Township is able to locate the illicit connection (and the connection is within Toms River) the responsible party will be notified immediately and a citation will be issued if the connection is not corrected or removed within six (6) months of discovery. If an illicit connection is found to originate from another public entity, Toms River Township will report the illicit connection to the Department and also notify the municipality from which it appears to originate.

5.2 STORMWATER BASINS

Most of the stormwater management system within Toms River Township relies on storm drains. However, there are two types of stormwater basins and both are present in Toms River. First, “detention basins” are built strictly to detain the stormwater for a period of time, while releasing water at a slow and controlled rate. They are designed to be dry between storm events. A second type of basin that is designed to manage stormwater flows is a “retention basin”. These basins are designed to stay wet by retaining a permanent pool so as to mimic a natural pond or lake. Toms River Township will implement a stormwater facility maintenance program

to insure that all stormwater facilities operated by the Township are functioning properly. Toms River Township operates three infiltration basins (Gilford Park, Adams Avenue, and Hickory Manor), the swales on Estate Point Road, and also catch basins and storm drains. The Toms River Township Public Works Department has implemented an annual cleaning program to maintain catch basin function and efficiency. All stormwater basins will be inspected once each year. If at any time of inspection, no sediment, trash or debris is observed in the catch basin, then that catch basin will not be cleaned. All catch basins will be inspected yearly, even if they were found to be "clean" the previous year. At the time of cleaning, the catch basins will also be inspected for proper function, and maintenance will be scheduled for those catch basins that are in disrepair. The annual catch basin cleaning program was initiated in April 2005.

Together, these coordinated operation and maintenance programs will enable Toms River Township to comply with the new stormwater management rules and regulations that have been adopted by the State of New Jersey. In addition, these programs will aid in the development and effectiveness of the Toms River Township's Mitigation Plan, as the stormwater management facilities that are in need of will be identified and prioritized to be retrofitted.

5.3 WATERSHED

The United States Geological Service has developed a method for identifying and inventorying watersheds in the U.S. called the hydrologic unit code system. Through this system all U.S. watersheds have a name and a corresponding number, this number is called the hydrologic unit code (HUC) or watershed address.

The term "HUC-14" is from the hydrologic unit code system for delineating and identifying drainage areas. The system starts with the largest possible drainage area (basin) and progressively breaks it down into smaller subdivisions (subbasins, watersheds and subwatersheds respectively). These subdivisions are delineated and numbered in a nested fashion. A drainage area with a 14 numbered address, or HUC-14, is a subwatershed of a larger watershed with 11 numbers, or a HUC-11. There are 921 HUC-14 subwatersheds in New Jersey that average 8.5 square miles. There are 150 HUC-11 watersheds in New Jersey with an average size of 51.9 square miles. A statewide graphic depiction of the breakdown of these watershed areas is available at: http://www.nj.gov/dep/watershedmgt/hucmap.htm (Source: NJDEP – Division of Watershed Management).

Toms River Township is located within the bounds of different HUC 14 subwatersheds. These subwatersheds which have been identified as HUC 14 unit codes 020403001060070 (Toms River-Route 76 to Hope Chapel Road), 02040301060080 (Toms River-Oak Ridge Parkway to Route 70), 02040301080050

(Ngel Branch-below Michaels Branch), 02040301080060 (Lower Toms River –Route 166 to Oak Ridge Parkway), 020403001090080 (Long Swamp Creek), 02040301050010 (Kettle Creek-above Lake Riveria outlet), 02040301050020 (Kettle Creek below Lake Riveria outlet), 02040301080090 (Lower Toms River-below Route 166), and 02040301050040 (Barnegat Bay North tributaries-Tide Creek to Route 37). These subwatershed areas are illustrated on Figure 2-Wetlands Map.

6.0 DESIGN AND PERFORMANCE STANDARDS

To minimize the adverse impact of stormwater runoff on water quality, water quantity and the loss of groundwater recharge in receiving water bodies, the Township will adopt design and performance standards that comply with the stormwater management measures as presented in N.J.A.C. 7:8. The design and performance standards include amended language for the inclusion of maintenance requirements, and safety standards consistent with N.J.A.C. 7:8-5.8 & 7:8-6. The design and performance standards will be incorporated into the Township's adopted Stormwater Control Ordinance.

Further, it is the intention of the Township of Toms River to incorporate both structural and nonstructural stormwater management strategies as presented in N.J.A.C. 7:8-5 to the maximum extent practicable. Major developments must meet one of two standards for groundwater recharge (N.J.A.C. 7:8-5.4(a)2.): (1) maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site or (2) infiltrate the increase in the stormwater runoff volume from pre-construction to post-construction for the two-year storm.

This groundwater recharge requirement does not apply to projects within "urban redevelopment areas" or to projects subject to the following types of stormwater:

- Stormwater from areas of high pollutant loading. High pollutant loading areas are areas in industrial and commercial developments where solvents and/or petroleum products are loaded/unloaded, stored, or applied, areas where pesticides are loaded/unloaded or stored, 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 areas where recharge would be inconsistent with Department approved remediation action work plan or landfill closure plan and areas with high risks for spills of toxic material, such as gas stations and vehicle maintenance facilities

- Industrial stormwater exposed to source material. "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, which could be a source of pollutants in any industrial stormwater discharge to groundwater. Source materials include, but are not limited to , raw materials, intermediate products, final products, waster material, 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.

Also, the project shall be designed in regards to recharge such that the hydraulic impact on the groundwater table is avoided. Potential adverse hydraulic impacts include, but are not limited to, exacerbating a naturally or seasonal high water table so as to cause surficial ponding, flooding of basements or interference with the proper operation of subsurface disposal systems and other subsurface structures in the vicinity or down gradient of the recharge area.

For water quality (N.J.A.C. 7:8-5.5), stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in the stormwater runoff generated by the water quality design storm by 80 percent of the anticipated load from the major development.

To control stormwater runoff quantity impacts (N.J.A.C. 7:8-5.4 3.), a major development must also meet one of three design standards: (1) demonstrate at no point in time that the post-construction runoff hydrograph exceed the pre-construction runoff hydrograph, (2) demonstrate there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the 2, 10, 100-year storm event and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site, and (3) demonstrate the postconstruction peak runoff rates for the 2, 10 and 100-year storm events are 50, 75 and 80 percent, respectively, of the pre-construction runoff rates. However, for stormwater water runoff quantity requirement (3), stream encroachment standards (N.J.A.C. 7:13-2.8) will require for the 100-year storm event 75 percent of the pre-construction peak runoff rates. Prior to adoption, these ordinances will all be submitted to the Ocean County Planning Board for review and approval within 24 months of the EDPA.

The second set of rules are the Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program Rules (N.J.A.C. 7:14A). These Rules are intended to address and reduce pollutants associated with existing stormwater runoff. The Rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These rules govern the issuance of permits to entities that own or operate “small” (those that serve a population of under 100,000) municipal separate storm sewer systems, known as MS4s. Under this program permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and Federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste

disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); locating discharge points and stenciling catch basins; and a public education component

Owners or operators of small MS4s would be required to develop and implement a storm water management program designed to reduce the discharge of pollutants to the maximum extent practicable and protect water quality. Control measures are expected to include, at a minimum, the following components:

- Public education and outreach
- Public involvement and participation
- Illicit discharge detection and elimination
- Construction site storm water runoff control
- Post-construction storm water management in new development and redevelopment
- Pollution prevention/good housekeeping for municipal operations.

6.1 IMPLEMENTING NON-STRUCTURAL STORMWATER MANAGEMENT STRATEGIES

The implementation of non-structural Best Management Practices are strongly encouraged to be added to the Township's existing development regulations and applied to all new site design proposals. Whenever possible, the following nine strategies should be incorporated into site design:

- Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;
- Minimize impervious surfaces and break up or disconnect the flow of runoff over
- impervious surfaces;
- Maximize the protection of natural drainage features and vegetation;
- Minimize the decrease in the "time of concentration" from pre-construction to post construction. "Time of Concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the drainage area to the point of interest within a watershed;
- Minimize land disturbance including clearing and grading;
- Minimize soil compaction;
- Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;
- Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas; and
- Provide other source controls to prevent or minimize the use or exposure of pollutants at the site in order to prevent or minimize the release of those pollutants into stormwater runoff. These source controls include, but are not limited to:

i. Site design features that help to prevent accumulation of trash and debris in drainage systems;

ii. Site design features that help to prevent discharge of trash and debris from drainage systems;

iii. Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and

iv. When establishing vegetation after land disturbance, applying 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.

To manage stormwater and protect the public interest, Toms River Township has already implemented a number of ordinances and regulations that incorporate non-structural stormwater management measures into the site deign of a proposed development. Chapter 348 “Land Use and Development Regulations”, of the Township’s Code was reviewed with regard to incorporating nonstructural stormwater management strategies. A summary of the of the pertinent provisions is presented below:

Sections 2.1(Definitions) This section stipulates that the minor site plans conform to the requirements of Chapter 313, Flood Damage Prevention, Chapter 438, Soil Disturbance, Chapter 417, Trees, and Chapter 497, Watercourses and Coastal Wetlands, of the Code of the Township of Toms River. Minor subdivisions must conform to the requirements of Chapter 313, Flood Damage Prevention, Chapter 438, Soil Disturbance, Chapter 417, Trees, and Chapter 497, Watercourses and Coastal Wetlands, of the Code of the Township of Toms River.

Section 5.13(Preservation of Natural Features) Indicates that Environmentally Sensitive Features shall be preserved in their natural state wherever feasible. These features consist of: floodway and flood hazard areas, wetlands, areas containing a significant number of specimen trees, land with slopes in excess of 10%, existing watercourses, ponds, bogs and swamps, land with a seasonal high-water table of less than two feet, and lands classified as "tidal wetland," "flood hazard area," "wet soil woodland," "wet soil old field" or "prime agricultural land" in the Environmental Base Study prepared for the Toms River Township Planning Board and the Toms River Township Environmental Commission in 1974 and incorporated as a part of the 1976 revision of the Toms River Township Master Plan adopted by the Planning Board on December 20, 1976.

Section 5.27 (Tidal Wetlands Permit) This section provides that “No building, structure or use shall be permitted within areas defined as wetlands by the New Jersey

Wetlands Act of 1970 and delineated on the wetlands map prepared by the New Jersey Department of Environmental Protection, except in accordance with a permit issued under the Act."

Section 5.28 (Municipal Wetlands Permit) In addition to wetlands permits issued by the NJDEP, Toms River Township's Municipal Wetlands Permit states that "No building, structure or use shall be permitted within areas defined as wetlands in Chapter 497, Watercourses and Coastal Wetlands, of the Code of the Township of Toms River, except in accordance with a permit issued under that chapter."

Section 8.4 (Buffer areas, screening, landscaping and shade trees) States that under the current buffer provisions, all uses, other than single-family detached and two-family detached dwellings and their accessory uses (except as otherwise provided in this chapter), shall provide buffer areas along all side and rear property lines, which abut areas zoned residentially (including single-family detached, two-family or multifamily detached dwellings). Ranging from 100 feet to 20 feet, these buffer areas often contain vegetation and offer screening from adjacent properties. This section also outlines standards to protect topsoil, tree planting, protection and thinning requirements.

Sections 8.8, 10.5, 10.7, and 10.9 (Rural Residential Zone, Commercial, R-400C Conservation Residential Zone, R-150 Residential Zone) Cluster development provisions are available as alternatives within several zoning districts in Toms River including the R-150, R/C-3, R-800, and R-400 C zoning designations. The cluster option is an excellent tool for reducing the impervious cover imposed by roads and driveways. It also minimizes the disturbance of large tracts of land, reduces lot size, and protects large areas of environmentally sensitive land, while providing additional open space. The existing ordinance provides that 20% of the tract of land be dedicated as open space.

Section 5.30 (Floodplain Management) Outlines standards and provisions for areas contained within a delineated floodplain so as to minimize development and manage the risk of flooding within the floodplain.

Section 5.40 (Groundwater Remedial Action Activities) States that groundwater remedial action activities shall be deemed a permitted accessory use in all zones in the Township, and any structures installed to further said activities shall be deemed accessory structures. Said structures shall comply with the setbacks for accessory buildings in the particular zone such use is located, except when greater setbacks for accessory structures are required due to applicable conditional use requirements and shall not exceed a height of 16 feet.

Section 8.7 (Clearing and grading) Indicates the minimum slope, maximum grade, and other procedures for land developments to adhere to. In addition, the developer shall take all necessary precautions to prevent any siltation of streams during construction.

Section 8.19 and 8.20 (Off Street Parking and Loading) These sections outline off-street parking standards and loading requirements for all zones and in connection with every industrial, commercial, institutional, professional, recreational, residential or other use, except licensed child-care centers located in nonresidential zones.

Section 8.25 (Sidewalks and Aprons) Sets forth standards for sidewalks to abide by. Alternative sidewalks may be proposed within preliminary and/or final site plans for approval, however, it is proposed that the ordinances be amended tot include that where feasible, that sidewalks constructed of pervious material are encouraged by the Township". The same language is also encouraged to be incorporated into the driveway requirements that are spelled out within Toms River's existing regulations.

Section 8.11 (Curbs or curbs and gutters) This section spells out the guidelines for curbing and/or curb and gutter standards within Toms River. This section also indicates that conservation easements may be required along all drainage and stormwater rights-of-way in the development and may be required also along ponds, marshes, bogs and streams or other watercourses along which drainage rights-of-way are not required. Such easements are intended to help prevent the siltation of streams and other courses and the erosion of stream banks, other watercourses and adjacent lands. The land subjected to a conservation easement shall be a strip at least 25 feet but not more than 100 feet in width independently located or running adjacent to each side of any required drainage or stormwater right-of-way.

Section 8.29 (Street design) This section outlines the standards of street design and layout that development proposals shall adhere to.

In addition, the Township's most environmentally sensitive lands (including tidal wetlands along Barnegat Bay, floodplain areas along the Toms River, Long Swamp Creek, Kettle Creek, and North Branch Creek of Silver Bay) are placed within zoning districts that only allow uses that are non-land intensive and environmentally protective. The majority of the aforementioned lands are placed within one of the following zoning districts: C/R3 (Conservation/Residential; R-400C (Conservation Residential); or R-800 (Residential). The use and bulk requirements of these districts minimize environmental disturbance within these areas of the Township. Each of these zones allows low intensity residential development with large minimum lot areas. For example, the C/R3 requires a lot size of 3 acres and limits total impervious surfaces to 10%. Also, all three zones contain provisions for cluster development intended to preserve open space and conservation areas.

These summaries are only intended to provide an overview of how nonstructural BMP's have been incorporated into Toms River's existing regulations and also provide possible revisions that may be considered by the Township. Following the adoption of this plan, as ordinances are being prepared, the Township will review the above provisions and revise accordingly so as to comply with the standards set forth in N.J.A.C. 7:8 5-3.(b).

In addition, Appendix A provides a list of proposed amendments to Toms River's existing Land Use Development Regulations that pertain to stormwater and stormwater management. Following the adoption of this plan and the preparation of ordinances to implement the plan, the Township will review the above provisions in order to implement any necessary changes pursuant N.J.A.C. 7:8 5-3 (b) which states that nonstructural stormwater management strategies shall be incorporated into existing municipal ordinances "to the maximum extent practicable". The ordinances will then be sent to the county review agency for review and approval within 24 months of the EDPA. A copy will also be sent to the Department of Environmental Protection at the time of submission.

6.2 IMPLEMENTING STRUCTURAL STORMWATER MANAGEMENT STRATEGIES

As mentioned earlier, the NJDEP has implemented more rigid regulations regarding the volume, rate, and quality of stormwater originating on a new development site. Some sites may be able to achieve these standards through non-structural measures such as vegetative swales, buffers, and landscaping to control non-point source pollution. Other sites may require the building of a stormwater basin. In these cases, where the development of structural stormwater facilities is necessary, the New Jersey Department of Environmental Protection's BMP guide should be consulted. The structural BMP's utilized in low impact development concentrate on the following practices to be utilized in site development in conjunction with the non-structural methods described above:

- Bio-retention Systems – A bioretention system consists of a soil bed planted with native vegetation located above and underdrained sand layer. It can be configured either as a basin or a swale.

- Constructed Stormwater Wetlands – Constructed wetlands are wetlands systems designed to maximize the removal of pollutants from stormwater runoff through settling and both uptake and filtering by the vegetation.

- Dry Wells - A dry well is a subsurface storage facility that receives and temporarily stores stormwater runoff from roofs and structures. Discharge of the accumulated stormwater from a dry well occurs through infiltration into the surrounding soils.

- Extended Detention Basins - An extended detention basin is a facility constructed through excavation or embankments that provides temporary storage of stormwater runoff. It has an outlet structure that detains runoff inflow and allows for controlled outflow to aid in mitigating stormwater flows from development. Usually this type of structure is utilized to provide both water quantity and water quality mitigation.

- Infiltrative Basins – Infiltration Basins are similar to detention basins in that they both temporarily store stormwater runoff generated from development project. The principal outlet to this type of basin is not a constructed outlet structure, but rather the highly permeable soils allowing for infiltration into the surrounding subsoils.

- Manufactured Treatment Devices – A manufactured treatment device is a pre-fabricated stormwater treatment structure utilizing settling, filtration, absorptive materials, vortex separation, vegetative components, and/or other appropriate technology to remove pollutants from stormwater runoff.

- Pervious Paving Systems – Pervious pavement utilizes paving material which allows for stormwater to infiltrate through the pavement rather than accumulate as is the case with standard paving material. Pervious pavement utilizes void areas within the paving material to provide for this permeable feature.

- Sand Filters – A sand filter consists of a forebay and an underdrained sand bed. Runoff entering the sand filter is conveyed first through the forebay, which removes trash, debris and coarse sediments, and then infiltrates through the sand bed to an outlet pipe at the bottom of said filter.

- Vegetative Filters – A vegetative filter is an area designed to remove suspended solids and other pollutants from stormwater runoff flowing through a length of vegetation, called a vegetative filter strip. The vegetation in a filter strip can range from turf grass to woody vegetation.

- Wet Ponds - A wet pond is a facility constructed through excavation or embankments that provides both permanent and temporary storage of stormwater runoff. It has an outlet structure that creates a permanent pool and detains and attenuates runoff inflows promoting the settlement of pollutants.

Further, all structural stormwater management measures (structural BMP's) shall be designed according to the following conditions:

- They should to take into account the existing site conditions, 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; and the presence of solution-prone carbonate rocks (limestone).

- They should 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 be 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 N.J.A.C. 7:8-7.D. See Stormwater Control Ordinance – Pinelands Jurisdictional Areas for trash rack specifications in Pinelands Jurisdictional Areas

- They should be designed, constructed, and installed to be strong, durable, and corrosion resistant. Measures that are consistent with the relevant portions of the Residential Site Improvements Standards at N.J.A.C. 5:21-7.3, 7.4, and 7.5 shall be deemed to meet this requirement.

- 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.

- Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at Section N.J.A.C. 7:8-6.

- Stormwater management measure guidelines are available in the New Jersey Stormwater Best Management Practices Manual. Other stormwater management measures may be utilized provided the design engineer demonstrates that the proposed measure and its design will accomplish the required water quantity, groundwater recharge and water quality design and performance standards established by this subchapter.

- Manufactured treatment devices may be used to meet the requirements of this subchapter, provided the pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the Department.

- In order to ensure adequate long term operation as well as preventative and corrective maintenance of stormwater management measures and structural BMP's, the designers of such facilities should submit to the municipality a *Maintenance Plan* indicating specific maintenance tasks and schedules as indicated in N.J.A.C. 7:8-5.8 "Maintenance Requirements". This maintenance plan will require the ultimate user of said structural BMP's to provide an annual certification that the stormwater management measures approved are functioning as designed and that the proper maintenance and inspection of said measures have been performed. Random spot inspections by the municipality will be conducted to ensure compliance along with appropriate enforcement actions such as fines to be levied should non-compliance result.

Non-land intensive BMP's are strongly encouraged to be incorporated into Toms River's existing stormwater management infrastructure so as to improve both groundwater recharge and the quality of stormwater runoff that originates in the Township.

6.3 PLAN CONSISTENCY

Currently, land in Toms River is not contained within the bounds of an adopted a Regional Stormwater Management Plan (RSWMP) and no Total Maximum Daily Loads (TMDL's) have been developed for waters within the Township. Therefore, at this time, it is not necessary for the amendments proposed in this plan to adhere to standards developed through the adoption of a Regional Stormwater Management Plan.

Also, this Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) N.J.A.C. 5:21, and the Township will utilize the most current update of the RSIS in the stormwater management review of residential areas. The Township's Stormwater Management Ordinance requires all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction activities, municipal inspectors will observe land disturbance as well as on-site soil erosion and sediment control measures and will report any inconsistency to the local Soil Conservation District.

Once adopted, the intent of the TMDLs is to reduce pollutant loadings by limiting the amount of the targeted pollutants that have been noted to exceed what the receiving water bodies can adequately handle and dissipate.

6.4 MITIGATION PLANS

A Mitigation Plan is an optional component of municipal stormwater ordinances under the new N.J.A.C. 7:8 Stormwater Management Guideline. For a Township to grant a waiver or variance from these requirements, a mitigation plan is required from the design and performance standards that will be adopted per the new regulations. Mitigation projects will only be available in Non-Pinelands jurisdictional areas due to the relatively small area of Pinelands jurisdiction in the Township and varying regulations.

Under the Township's Mitigation Plan, developers would be required to contribute to or complete a mitigating alternative that clearly offsets the effect on groundwater recharge, stormwater quantity control, and/or stormwater quality control that was created by granting the variance or exemption. Toms River Township will require applicants that are seeking a variance or exemption to refer to the current list of mitigation projects that would qualify as candidates to be included in the applicant's proposed mitigation plan.

The Toms River Township Planning Board and Environmental Commission, in conjunction with the Township Engineer shall develop a list of mitigation projects. The list is intended to provide a hierarchy of projects for each of the 3 elements of the

design and performance standards of Toms River Township's MSWMP. Specifically, the list will include mitigation projects for groundwater recharge, mitigation projects for stormwater quantity control and mitigation projects for stormwater quality control. The list will also provide additional information on each project, including its, permit requirements, land ownership, and estimated project costs (i.e., permitting fees, engineering costs, construction costs, and maintenance costs). Further, the current list of available mitigation projects will be maintained at the Toms River Township Municipal Building and will be available to the applicant upon request.

If a suitable site cannot be located in the same drainage area as the proposed development, the mitigation project may provide mitigation that is not the same as the impacts for which the variance or exemption is sought, but that addresses the same issue. For example, if a variance is given because the 80 percent TSS requirement is not met, the selected project may address water quality impacts due to fecal coliform or phosphorous.

Toms River may also allow a developer to provide funding or partial funding for an environmental enhancement project that has been identified on the Toms River Township Mitigation Project list, or towards the development of a Regional Stormwater Management Plan. The Township will create a Mitigation account to maintain and administer these funds. The funding must be equal to or greater than the cost to implement the mitigation project, including costs associated with purchasing the property or easement for mitigation, and the cost associated with the long-term maintenance requirements of the mitigation measure. Further, the adoption of a mitigation plan would create yet another potential funding source to advance these projects that the Township has identified to hold the highest potential to alleviate stormwater management problems in the Township.

It shall be noted that in the event that the Township grants a waiver from providing the required groundwater recharge, stormwater quantity control and/or stormwater quality control requirement of the ordinance, and requires some form of mitigation to compensate, if the project falls under the jurisdiction of another agency such as the NJDEP, the applicant must also obtain approval of it's mitigation proposal form all reviewing agencies. The applicant shall be aware that the Township does not have sole authority to approve a mitigation proposal on projects with multiple review agencies. In addition, in the event that the New Jersey Department of Environmental Protection grants a waiver or variance from the requirements of NJAC 7:8, municipal review and approval is also required. The applicant shall obtain all required permits for the mitigation project prior to municipal approval, including Green Acres approval for those open space and recreational lands encumbers by Green Acres.

6.5 STREAM CORRIDOR PROTECTION

At this time the method of providing stream corridor protection will be to enforce the recommended buffer requirements promulgated under NJAC 7:8 and NJAC 7:13 for both Special Water Resource Protection Areas and Riparian Zones, respectively.

6.6 LONG TERM O&M OF BMPs

All BMP's are required to follow the recommended O&M manual that was prepared and submitted as part of the Site Plan and Subdivision approval process. The procedures in the manual are required to be followed as part of each application's approval. Non compliance can result in a fine as outlined in the Townships' Stormwater Management Ordinance, see attached.

6.7 MASTER PLAN REVIEW AND EVALUATION

A review of the Township's Zoning Map, Development regulations and Master plan, which was recently adopted in 2006, sufficiently addresses stormwater management. The plan identifies problematic drainage issues and areas to focus on. To address these issues as well as future development, it noteses & references the recently adopted stormwater management standards (NJAC 7:8). This Townships' recently a The plan also adequately discuses the issue of groundwater protection.

6.8 OFFICIAL MAP REVIEW AND EVALUATION

Maps, or figures as referenced in this ordinance, have been prepared to educate the public of the various environmental features that make up the Township. These maps depict features such as groundwater recharge areas, stream corridor buffers, flood zones and topography. These maps will also aid future planners, engineers and developers in assessing future land development.

6.9 DEVELOPMENT REGULATIONS REVIEW AND EVALUATION

In addition to the adoption of the NJDEP & Pinelands recommended model Stormwater Management Ordinance, the township has adopted supplemental NJDEP recommended ordinances that help to promote water quality such as the Pet Waste Ordinance, Woodlands Management Ordinance and the Storm Drainage Facilities Ordinance.

The Township's Land Development Ordinance now promotes low impact development techniques for stormwater management and associated passive effects by implementation of a cluster development option.

APPENDIX A - EXISTING STORMWATER REGULATIONS

§348-8.28. Storm drainage facilities.

A. General requirements. All storm drainage facilities shall be constructed in accordance with the applicable requirements of the Standard Specifications. The developer or his engineer shall submit complete calculations, specifications, plans and details for all proposed storm drainage facilities. Any field samples or laboratory tests required to document the conclusions of such calculations shall be formed at the sole expense of the developer.

B. Storm drain pipe. All storm drain pipes shall be either slip-joint-type reinforced concrete or, subject to the restrictions herein, fully coated, invert paved, corrugated-metal steel culvert pipe meeting the requirements of the Standard Specifications and of a wall thickness sufficient to meet the proposed conditions of service; but in any event, no wall thickness less than Class 3, Wall B, for concrete pipe or fourteen-gauge for corrugated-metal steel pipe shall be allowed. Generally, concrete pipe will be used except in areas of steep grades or other restrictive physical conditions where corrugated-metal or other types of pipe may be permitted. No concrete pipe may be laid on grades exceeding 10%. Concrete pipe below 30 inches, or equivalent, in size will be jointed using a mortared joint in accordance with the specifications. Concrete storm drain pipes, 30 inches or larger in diameter, will be jointed using a preformed bituminous mastic pressure-type joint sealer or rubber-ring-type or other equivalent approved joint. All corrugated.metal pipe shall be fully bituminous-coated with paved invert and of a gauge meeting the requirements of the Standard Specifications sufficient for the proposed service. Where conditions permit, corrugated-aluminum storm drains may be substituted for corrugated-metal steel storm drains where the same are otherwise permitted on the basis of an equivalent three-edge bearing or crushed strength. Substitution on an equivalent-gauge basis will not be allowed. All storm drains shall be tangent between inlets, manholes or other structures, except that the use of fittings or factory-curved or mitered pipe may be allowed by the Township Engineer when necessary to accommodate existing geometry or utilities. Prior to laying any storm drains, the bottom of all trenches shall be inspected by the Township Engineer. Should the Engineer determine that the trench is unsuitable for the placement of the pipe, the developer shall take all necessary action to remove or eliminate any unsuitable conditions. These may include, but are not limited to, excavation and backfilling with suitable material, placement of bedding material, construction of pipe cradles or such other action necessary to remove all unsuitable conditions. Proposed storm drainage installations which do not conform to the above must be fully detailed and approved as part of the final plat.

C. Inlets and manholes. Inlets and manholes shall be constructed, where required, in accordance with the requirements of the Standard Specifications and Standard Construction Details.

D. Headwalls. All pipe terminations shall be provided with poured-concrete headwalls, precast-concrete end sections or corrugated-metal end sections in accordance with the

approved final plat. Poured-concrete headwalls shall be wing-type headwalls with aprons in accordance with the Standard Construction Details.

E. Inlet and manhole location.

(1)In continuous conduit runs, spacing between structures (inlets or manholes) shall not exceed 600 feet.

(2)Structures (inlets or manholes) shall be located so as not to interfere with primary routes of pedestrian travel or any proposed handicapped ramp or similar facility.

(3)In general, surface flow length, for flows of four or more cubic feet per second, on paved surfaces shall not exceed 750 feet, provided that:

(a)Gutter flow widths on local and local collector streets shall not exceed 11 feet or such narrower width as may be necessary to provide a twelve-foot-wide clear lane in the center of the roadway.

(b)Gutter flow widths on minor collector streets shall not exceed nine feet or such narrower width as may be necessary to provide two twelve-foot-wide clear lanes in the center of the roadway.

(c)Gutter flow widths on major collector streets without shoulders shall not exceed five feet or such narrower width as may be necessary to provide four ten-foot-wide clear lanes in the center of the roadway.

(d)Gutter flow widths on minor and principal arterial streets and major collector streets with shoulders shall be retained within the shoulder areas.

(e)Swale gutter flow widths in parking areas shall not exceed 12 feet.

(f)Gutter flow widths shall provide for the maintenance of two ten-foot-wide clear lanes in all access and major circulation drives and one twelve-foot-wide clear lane in all other aisles in all parking areas, except as otherwise provided in Subsection E(7).

(4)Maximum design capacities which may be used to determine actual inlet location and spacing are:

(a)Not in sump conditions:

(b)In sump conditions: to be individually designed.

(5)Only Type B inlets shall be used in curbed roadways or curbed access or major circulation drives.

(6)Generally, sufficient inlets will be placed to eliminate any flow exceeding two cubic feet per second across any intersections.

(7)Parking areas may be designed to allow ponding in order to decrease intensity of runoff. In such case, ponding will not be allowed in any access or major circulation drive or in any area of heavy pedestrian activity and shall not exceed six inches at any point calculated for the appropriate design storm in accordance with Subsection H(1) and shall meet the criteria set forth in Subsection H(11).

F. Type of inlets and manholes. All curb inlets shall be New Jersey Department of Transportation Standard Type B and all yard inlets shall be Standard Type E; all manholes shall be New Jersey Department of Transportation standard four-foot diameter, unless a larger diameter is necessary. Casting heights on curb inlets shall be two inches greater than the specified curb face, and the gutter shall be properly transitioned approximately 10 feet on either side of the inlet.

G. Open channels

(1)Open channels shall be designed to contain the required flow and shall have a design velocity low enough, in the judgment of the Planning Board Engineer, to prevent erosion. The minimum easement for open channel sections shall be the maximum design top width of the channel section segment plus 25 feet rounded to the next highest five-foot increment. The excess easement area shall be provided offset to that side of the channel most convenient for use by maintenance crews. The minimum distance between the channel top edge and any easement line shall be five feet. Excess velocity, if any, as determined by the Planning Board Engineer, in open channels must be controlled by sod, riprap, paving, ditch checks or other suitable methods. Changes of direction in open channels must have a maximum radius of 800 feet or be adequately paved or riprapped.

(2) Generally, unlined open channel cross sections shall have side slopes not steeper than 4:1 for channel depths of two feet or less and not steeper than 8:1 for channel depths of more than two feet. Lined open channel side slopes shall not be steeper than 2:1.

(3)The bottoms of all unlined open channels and the channel side slopes, to at least the design flow level, will be sodded with suitable coarse grass sod.

(4)All unlined open channel side slopes above the design minimum flow level will be topsoiled and seeded or otherwise suitably stabilized in accordance with an approved soil disturbance permit.

(5)All unlined open channels which can be expected to have a base flow of five cubic feet per second or more for at least two out of every 12 months will be provided with a low flow channel using gabions, riprap, lining, one-third pipe sections or other arrangements approved as part of the final plat submission.

H. Minimum basis for calculations.

(1)Design storm frequency.

(a)For closed conduits: five years; or if the above results in a conduit size at least equivalent to a twenty-one-inch reinforced-concrete pipe, then 10 years; or if the above results in a conduit size at least equivalent to a thirty-inch reinforced-concrete pipe, then 25 years; or if the above results in a conduit size at least equivalent to a fifty-four-inch reinforced-concrete pipe, then 50 years.

(b)For open channels: 10 years; of if the tributary area exceeds 50 acres, then 25 years; or if the tributary area exceeds 250 acres, then 50 years. The flooding limits for storms with a return period of twice the design storm shall be determined for all open channels. Such limits shall be the drainage or conservation easements delineated on the plat.

(c)For detention facilities: a twenty-four-hour flood with a return period not less than 50 years or, if the tributary area exceeds 50 acres, then 100 years.

(d)For retention facilities: double the capacity obtained by applying the requirements for detention facilities.

(e)For gutter flow calculations: 10 years for local, local collector and minor collector streets, 25 years for major collectors and minor arterials and 50 years for principal arterials.

(2)Runoff calculations. Runoff determinations should be made using the rational formula or, in unusual cases, other methods with the prior approval of the Planning Board. Upstream areas should be considered based on their full development potential according to current zoning or the current use, whichever produces the greatest runoff. Runoff coefficients used should generally fall in the following ranges:

(3)Velocity restriction.

(a)In general, velocities in closed conduits at design flow should be at least two feet per second but not more than that velocity which will cause erosion damage to the conduit. In general, velocities in open channels at design flow shall not be less than one-half-foot per second and not greater than that velocity which will begin to cause erosion or scouring of the channel. For unlined earth channels the maximum velocity allowed will be two feet per second. For other channels sufficient design data and soil tests to determine the character of the channel shall be made by the developer and shall be made available to the Planning Board at the time of drainage review.

(b)At transitions between closed conduits and open channels or different types of open channels, suitable provisions must be made to accommodate the velocity transitions. These provisions may include riprapping, gabions, lining, aprons, chutes and checks, or others, all suitably detailed and approved as part of the final plat submission. For all flow of 40 cubic feet per second or more, tailwater depth and velocity calculations shall be submitted.

(4)Design formulas and friction factors. In general, the Manning formula will be used by the Planning Board to review the adequacy of proposed drainage facilities. Other formulas may be used in particular cases with the previous agreement of the Board. A friction factor (n) of 0.012 will be used for nonporous concrete pipe; a factor of 0.020 will be used for fully coated corrugated-metal pipe with paved invert. Commensurate factors will be used for other pipe types or shapes. A friction factor (n) of not less than 0.012 will be used for fully lined concrete channels; a factor of not less than 0.025 will be used for good earth channels; and a factor of not less than 0.100 will be used for fair to poor natural streams and watercourses. Commensurate factors will be used for other channel types.

(5) All drainage facilities carrying runoff from tributary areas larger than 1/2 square mile must have the approval of the New Jersey Division of Water Policy and Supply.

(6)All encroachments of natural waterways must be referred to the New Jersey Division of Water Policy and Supply for approval in accordance with statute. The state may retain jurisdiction, in which case a permit will be necessary as set forth above, or may refer the matter to the County Engineer for review.

(7)All nonpipe culverts shall be designed for AASHO H20-44 loading. All culverts of any type shall be carried to the roadway right-of-way and shall terminate with headwalls or other approved end treatment. All conduits terminating or beginning in open channels shall be provided with headwalls or other appropriate end treatment.

(8)Guardrails and/or railings shall be placed at all drainage structures where the interests of pedestrian or vehicular safety would dictate. The Planning Board may require that any open channel, other than naturally occurring streams, be fenced with chain link fencing 48 inches high if the banks of the channel are steeper than one foot vertically for every four feet horizontally and either the total depth of the channel exceeds four feet, or the channel would be expected to have a depth of flow greater than two feet more often than once every 10 years. For maintenance purposes, gates may be required by the Planning Board at approximately two-hundred-foot intervals.

(9)Storm drainage systems shall be designed to include not only the proper drainage of the actual area of the specific development and the area tributary thereto but shall also include the disposal of the stormwater runoff to an adequate outlet or other means of final disposal of the stormwater, such as an ocean, river, running stream, lagoon or an existing adequate storm sewer.

(10)The use of siltation and oil separation basins with controlled outflows will be required to prevent pollution of waterways when discharge is into a lagoon, bay or other standing body of water.

(11)Whenever sump conditions occur, an analysis shall be made of the effect of the occurrence of a major storm having at least a one-hundred-year return frequency. The effect of such storm and the flooding limits anticipated shall be shown. Site design,

grading and drainage shall anticipate such major storm and be so arranged as to prevent damage to existing or proposed structures or adjacent properties under such conditions.

I. Special drainage provisions

(1)The existing system of natural drainage within each development shall be preserved to the maximum extent possible. To this end, the Board may require the preservation of natural drainage swales, recharge areas, wet weather ponds and similar features and may require suitable drainage and conservation easements and possible increases in lot size to allow usable lots with the preservation of such features.

(2)Subject to review and approval by the Board, the design of the development may be modified to take advantage of the natural drainage features of the land. In such review, the Board will use the following criteria:

(a)The utilization of the natural drainage system to the fullest extent possible.

(b)The maintenance of the natural drainage system as much as possible in its unimproved state.

(c)When drainage channels are required, wide shallow swales with natural vegetation will be preferred to other sections.

(d)The construction of flow-retarding devices, detention areas and recharge berms to minimize runoff value increases.

(e)Maintenance of the base flow in streams, reservoirs and ponds.

(f)The reinforcement, improvement and/or extension of the natural drainage system to such an extent as is necessary to eliminate flooding and excess maintenance requirements.

(3)All developments or portions of total schemes of development which, based upon the preliminary plat submission, total 15 or more acres will be expected, to the extent that the Board considers possible, to limit the total stormwater runoff from the site after development to not more than 115% of the runoff from the site in its undeveloped state. The utilization of the provisions of this section to limit such runoff are encouraged. However, the Board may require the use of reasonable artificial methods of detention and/or recharge if it determines that natural provisions are not feasible. The Board may waive the provisions of this section if the nature of the development, the character of adjacent previously developed areas or other factors make the utilization of natural drainage features or runoff-limiting devices inadvisable or impractical.

APPENDIX B - MODEL STORMWATER ORDINANCE – NON PINELANDS JURISDICTIONAL AREA

Section 1: Scope and Purpose

A. Policy Statement

Flood control, groundwater recharge, and pollutant reduction through nonstructural or low impact techniques shall be explored before relying on structural BMPs. Structural BMPs should be integrated with nonstructural stormwater management strategies and proper maintenance plans. Nonstructural strategies include both environmentally sensitive site design and source controls that prevent pollutants from being placed on the site or from being exposed to stormwater. Source control plans should be developed based upon physical site conditions and the origin, nature, and the anticipated quantity or amount of potential pollutants. Multiple stormwater management BMPs may be necessary to achieve the established performance standards for water quality, quantity, and groundwater recharge.

B. Purpose

It is the purpose of this ordinance to establish minimum stormwater management requirements and controls for “major development,” as defined in Section 2.

C. Applicability

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:

a. Non-residential major developments; and

b. Aspects of residential major developments that are not pre-empted by the Residential Site Improvement Standards at N.J.A.C. 5:21.

2. This ordinance shall also be applicable to all major developments undertaken by said municipality.

D. Compatibility with Other Permit and Ordinance Requirements

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 is not intended to interfere with, abrogate, or annul any other ordinances, rule or regulation, statute, or other provision of law except that, where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, the more restrictive provisions or higher standards shall control.

Section 2: Definitions

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. 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.

“CAFRA Planning Map” means the geographic depiction of the boundaries for Coastal Planning Areas, CAFRA Centers, CAFRA Cores and CAFRA Nodes pursuant to N.J.A.C. 7:7E-5B.3.

“CAFRA Centers, Cores or Nodes” means those areas within boundaries accepted by the Department pursuant to N.J.A.C. 7:8E-5B.

“Compaction” means the increase in soil bulk density.

“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 an agency designated by the County Board of Chosen Freeholders to review municipal stormwater management plans and implementing ordinance(s). The county review agency may either be:

A county planning agency; or

A county water resource association created under N.J.S.A 58:16A-55.5, if the ordinance or resolution delegates authority to approve, conditionally approve, or disapprove municipal stormwater management plans and implementing ordinances.

“Department” means the New Jersey Department of Environmental Protection.

“Designated Center” means a State Development and Redevelopment Plan Center as designated by the State Planning Commission such as urban, regional, town, village, or hamlet.

“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 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.

“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 areas” 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; and well head protection and groundwater recharge areas. Habitats of endangered or threatened species are identified using the Department’s Landscape Project as approved by the Department’s Endangered and Nongame Species Program.

“Empowerment Neighborhood” means a neighborhood designated by the Urban Coordinating Council “in consultation and conjunction with” the New Jersey Redevelopment Authority pursuant to N.J.S.A 55:19-69.

“Erosion” means the detachment and movement of soil or rock fragments by water, wind, ice or gravity.

“Impervious surface” means a surface that has been covered with a layer of material so that it is highly resistant to infiltration by water.

“Infiltration” is the process by which water seeps into the soil from precipitation.

“Major development” means any “development” that provides for ultimately disturbing one or more acres of land. Disturbance for the purpose of this rule is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting, or removing of vegetation.

“Municipality” means any city, borough, town, township, or village.

“Node” means an area designated by the State Planning Commission concentrating facilities and activities which are not organized in a compact form.

“Nutrient” means a chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the development of organisms.

“Person” means any individual, corporation, company, partnership, firm, association, Township of Toms River, 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.

“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.

“Recharge” means the amount of water from precipitation that infiltrates into the ground and is not evapotranspired.

“Sediment” means solid material, mineral or organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water or gravity as a product of erosion.

“Site” means the lot or lots upon which a major development is to occur or has occurred.

“Soil” means all unconsolidated mineral and organic material of any origin.

“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.

“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.

“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.

“Stormwater runoff” means water flow on the surface of the ground or in storm sewers, resulting from precipitation.

“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 (most constructed stormwater wetlands).

“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 groundwater recharge of stormwater or to eliminate illicit or illegal non-stormwater discharges into stormwater conveyances.

“Tidal Flood Hazard Area” means a flood hazard area, which may be influenced by stormwater runoff from inland areas, but which is primarily caused by the Atlantic Ocean.

“Urban Coordinating Council Empowerment Neighborhood” means a neighborhood given priority access to State resources through the New Jersey Redevelopment Authority.

“Urban Enterprise Zones” means a zone designated by the New Jersey Enterprise Zone Authority pursuant to the New Jersey Urban Enterprise Zones Act, N.J.S.A. 52:27H-60 et. seq.

“Urban Redevelopment Area” is defined as previously developed portions of areas:

(1) Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes;

(2) Designated as CAFRA Centers, Cores or Nodes;

(3) Designated as Urban Enterprise Zones; and

(4) Designated as Urban Coordinating Council Empowerment Neighborhoods.

“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.

"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.

Section 3: General Standards

A. Design and Performance Standards for Stormwater Management Measures

1. Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards 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.

2. The standards in this ordinance apply only to new major development and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain groundwater recharge. The standards do not apply to new 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.

Section 4: Stormwater Management Requirements for Major Development

A. 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.

B. Stormwater management measures shall avoid adverse impacts of concentrated flow on habitat for threatened and endangered species as documented in the Department' Landscape Project or Natural Heritage Database established under N.J.S.A. 13:1B-15.147 through 15.150.

C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Sections 4.F and 4.G:

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 made of permeable material.

D.A waiver from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Sections 4.F and 4.G 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:

1. The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;

2. The applicant demonstrates through an alternatives analysis, that through the use of nonstructural and structural stormwater management strategies and measures, the option selected complies with the requirements of Sections 4.F and 4.G to the maximum extent practicable;

3. The applicant demonstrates that, in order to meet the requirements of Sections 4.F and 4.G, existing structures currently in use, such as homes and buildings, would need to be condemned; and

4. 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 D.3 above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of Sections 4.F and 4.G that were not achievable on-site.

E. Nonstructural Stormwater Management Strategies

1. To the maximum extent practicable, the standards in Sections 4.F and 4.G shall be met by incorporating nonstructural stormwater management strategies set forth at Section 4.E into the design. The applicant shall identify the nonstructural measures incorporated into the design of the project. If the applicant contends that it is not feasible for engineering, environmental, or safety reasons to incorporate any nonstructural stormwater management measures identified in Paragraph 2 below into the design of a particular project, the applicant shall identify the strategy considered and provide a basis for the contention.

2. Nonstructural stormwater management strategies incorporated into site design shall:

   a. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;

   b. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;

   c. Maximize the protection of natural drainage features and vegetation;

   d. Minimize the decrease in the "time of concentration" from pre-construction to post construction. "Time of concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of interest within a watershed;

e. Minimize land disturbance including clearing and grading;

f. Minimize soil compaction;

g. Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;

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 or exposure of pollutants at the site, in order to prevent or minimize the release 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.E.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

A. When establishing vegetation after land disturbance, applying 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.

3. Site design features identified under Section 4.E.2.i.(2) above shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this paragraph, “solid and floatable materials” means sediment, debris, trash, and other floating, suspended, or settleable solids. For exemptions to this standard see Section 4.E.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;

(2) Where flows from the water quality design storm as specified in Section 4.G.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:

(a) 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

(b) 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.G.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.F and 4.G shall be dedicated to a government agency, subjected to a conservation restriction filed with the appropriate County Clerk's office, or 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.

F. Erosion Control, Groundwater Recharge and Runoff Quantity Standards

1. This subsection contains minimum design and performance standards to control erosion, encourage and control infiltration and groundwater recharge, and control stormwater runoff quantity impacts of major development.

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 groundwater recharge are as follows:

(1) The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at Section 5, either:

(a) Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site; or

(b) Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the 2-year storm is infiltrated.

(2) This groundwater recharge requirement does not apply to projects within the "urban redevelopment area," or to projects subject to (3) below.

(3) The following types of stormwater shall not be recharged:

(a) Stormwater from areas of high pollutant loading. High pollutant loading areas are areas in industrial and commercial developments where solvents and/or petroleum products are loaded/unloaded, stored, or applied, areas where pesticides are loaded/unloaded or stored; 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; areas where recharge would be inconsistent with 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) Industrial stormwater exposed to "source material." "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, which could be a source of pollutants in any industrial stormwater discharge to groundwater. 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.

(4) The design engineer shall assess the hydraulic impact on the groundwater table and design the site so as to avoid adverse hydraulic impacts. Potential adverse hydraulic impacts include, but are not limited to, exacerbating a naturally or seasonally high water table so as to cause surficial ponding, flooding of basements, or interference with the proper operation of subsurface sewage disposal systems and other subsurface structures in the vicinity or downgradient of the groundwater recharge area.

c. In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at Section 5, complete one of the following:

(1) Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the two, 10, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;

(2) Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the two, 10, and 100-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts of existing land uses and projected land uses assuming full development under existing zoning and land use ordinances in the drainage area;

(3) Design stormwater management measures so that the post-construction peak runoff rates for the 2, 10 and 100 year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed. The percentages shall not be applied to post-construction stormwater runoff into tidal flood hazard areas if the increased volume of stormwater runoff will not increase flood damages below the point of discharge; or

(4) In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with (1), (2) and (3) above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.

2. Any application for a new agricultural development that meets the definition of major development at 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. For the purposes of this section, “agricultural development” means land uses normally associated with the production of food, fiber and livestock for sale. Such uses do not include the development of land for the processing or sale of food and the manufacturing of agriculturally related products.

G. Stormwater Runoff Quality Standards

1. Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff by 80 percent of the anticipated load from the developed site, expressed as an annual average. Stormwater management measures shall only be required for water quality control if an additional 1/4 acre 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. The water quality design storm is 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. The calculation of the volume of runoff may take into account the implementation of non-structural and structural stormwater management measures.

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		

2. For purposes of TSS reduction calculations, Table 2 below presents the presumed removal rates for certain BMPs designed in accordance with 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. 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 removal rates and methods of calculating removal rates may be used if the design engineer provides documentation demonstrating the capability of these alternative rates and methods to the review agency. A copy of any approved alternative rate or method of calculating the removal rate 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.

3. 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:

   R = A + B – (AXB)/100

   Where

   R = total TSS percent load removal from application of both BMPs, and

   A = the TSS percent removal rate applicable to the first BMP

   B = the TSS percent removal rate applicable to the second BMP

Table 2: TSS Removal Rates for BMPs

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

4. If there is more than one onsite drainage area, the 80 percent TSS removal rate shall apply to each drainage area, unless the runoff from the subareas converge on site in which case the removal rate can be demonstrated through a calculation using a weighted average.

5. Stormwater management measures shall also be designed to reduce, to the maximum extent feasible, the post-construction nutrient load of the anticipated load from the developed site in stormwater runoff generated from the water quality design storm. In achieving reduction of nutrients to the maximum extent feasible, 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.F and 4.G.

6. 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.

7. 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 to waters classified as FW1.

8. Special water resource protection areas shall be established 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, within the associated HUC14 drainage area. These areas shall be established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, and exceptional fisheries significance of those established Category One waters. 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:

      (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 is provided. (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, active agricultural use, parking area or maintained lawn area). The encroachment shall only be allowed where applicant demonstrates 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.

   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.

   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 associated with discharges allowed by this section shall achieve a 95 percent TSS post-construction removal rate;

      (3) Temperature shall be addressed to ensure no impact on the receiving waterway;

      (4) The encroachment shall only be allowed where the applicant demonstrates that the functional value and overall 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 subject to review and approval by the Department.

d. 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.G(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. A stream corridor protection plan for a waterway subject to G.8 shall maintain or enhance the current functional value and overall condition of the special water resource protection area as defined in G.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 G.8 does not apply to the construction of one individual single family dwelling that is not part of a larger development 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.

Section 5: Calculation of Stormwater Runoff and Groundwater Recharge

A. Stormwater runoff shall be calculated in accordance with the following:

1. The design engineer shall calculate runoff using one of the following methods:

a. The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Section 4 – Hydrology and Technical Release 55 – Urban Hydrology for Small Watersheds; or

b. The Rational Method for peak flow and the Modified Rational Method for hydrograph computations.

2. For the purpose of calculating runoff coefficients and groundwater recharge, there is a presumption that the pre-construction condition of a site or portion thereof is a wooded land use with good hydrologic condition. The term “runoff coefficient” applies to both the NRCS methodology at Section 5.A.1.a and the Rational and Modified Rational Methods at Section 5.A.1.b. A runoff coefficient or a groundwater recharge land cover for an existing condition may be used on all or a portion of the site if the design engineer verifies that the hydrologic condition has existed on the site or portion of the site for at least five years without interruption prior to the time of application. If more than one land cover have existed on the site during the five years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations. In addition, there is the presumption that the site is in good hydrologic condition (if the land use type is pasture, lawn, or park), with good cover (if

the land use type is woods), or with good hydrologic condition and conservation treatment (if the land use type is cultivation).

3. In computing pre-construction stormwater runoff, the design engineer shall account for all significant land features and structures, such as ponds, wetlands, depressions, hedgerows, or culverts, that may reduce pre-construction stormwater runoff rates and volumes.

4. In computing stormwater runoff from all design storms, the design engineer shall consider the relative stormwater runoff rates and/or volumes of pervious and impervious surfaces separately to accurately compute the rates and volume of stormwater runoff from the site. To calculate runoff from unconnected impervious cover, urban impervious area modifications as described in the NRCS Technical Release 55 – Urban Hydrology for Small Watersheds and other methods may be employed.

5. If the invert of the outlet structure of a stormwater management measure is below the flood hazard design flood elevation as defined at N.J.A.C. 7:13, the design engineer shall take into account the effects of tailwater in the design of structural stormwater management measures.

B. Groundwater recharge may be calculated in accordance with the following:

1. The New Jersey Geological Survey Report GSR-32 A Method for Evaluating Ground-Water Recharge Areas in New Jersey, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the New Jersey Stormwater Best Management Practices Manual; at http://www.state.nj.us/dep/njgs/; or at New Jersey Geological Survey, 29 Arctic Parkway, P.O. Box 427 Trenton, New Jersey 08625-0427; (609) 984-6587.

Section 6: Standards for Structural Stormwater Management Measures

A. Standards for structural stormwater management measures are as follows:

1. Structural stormwater management measures shall be designed to take into account the existing site conditions, 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; and the presence of solution-prone carbonate rocks (limestone).

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.D.

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.

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.

5. Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at Section 8.

B. Stormwater management measure guidelines are available in the New Jersey Stormwater Best Management Practices Manual. Other stormwater management measures may be utilized provided the design engineer demonstrates that the proposed measure and its design will accomplish the required water quantity, groundwater recharge and water quality design and performance standards established by Section 4 of this ordinance.

C. 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.

Section 7: Sources for Technical Guidance

A. 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 wetlands, dry wells, extended detention basins, infiltration structures, manufactured treatment devices, pervious paving, sand filters, vegetative filter strips, and wet ponds.

2. The New Jersey Department of Environmental Protection Stormwater Management Facilities Maintenance Manual, as amended.

B. Additional technical guidance for stormwater management measures can be obtained from the following:

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 or any of the Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)4. The location,

address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey 08625; (609) 292-5540;

2. The Rutgers Cooperative Extension Service, 732-932-9306; and

3. The Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey, 08625, (609) 292-5540.

Section 8: Safety Standards for Stormwater Management Basins

A. 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. All basins shall comply with the safety standards promulgated under NJAC 7:8-6.

B. Requirements for Trash Racks, Overflow Grates and Escape Provisions

1. A trash rack is a device designed to catch trash and debris and prevent the clogging of outlet structures. Trash racks shall be installed at the intake to the outlet from the stormwater management basin to ensure proper functioning of the basin outlets in accordance with the following:

   a. The trash rack shall have parallel bars, with no greater than six inch spacing between the bars.

   b. The trash rack shall be designed so as not to adversely affect the hydraulic performance of the outlet pipe or structure.

   c. The average velocity of flow through a clean trash rack is not to exceed 2.5 feet per second under the full range of stage and discharge. Velocity is to be computed on the basis of the net area of opening through the rack.

   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.

2. An overflow grate is designed to prevent obstruction of the overflow structure. If an outlet structure has an overflow grate, such grate shall meet the following requirements:

   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 less 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. For purposes of this paragraph 3, escape provisions means the permanent installation of ladders, steps, rungs, or other features that provide easily accessible means of egress from stormwater management basins. Stormwater management basins shall include escape provisions as follows:

   a. If a stormwater management basin has an outlet structure, escape provisions shall be incorporated in or on the structure. With the prior approval of the reviewing

agency identified in Section 8.C a free-standing outlet structure may be exempted from this requirement.

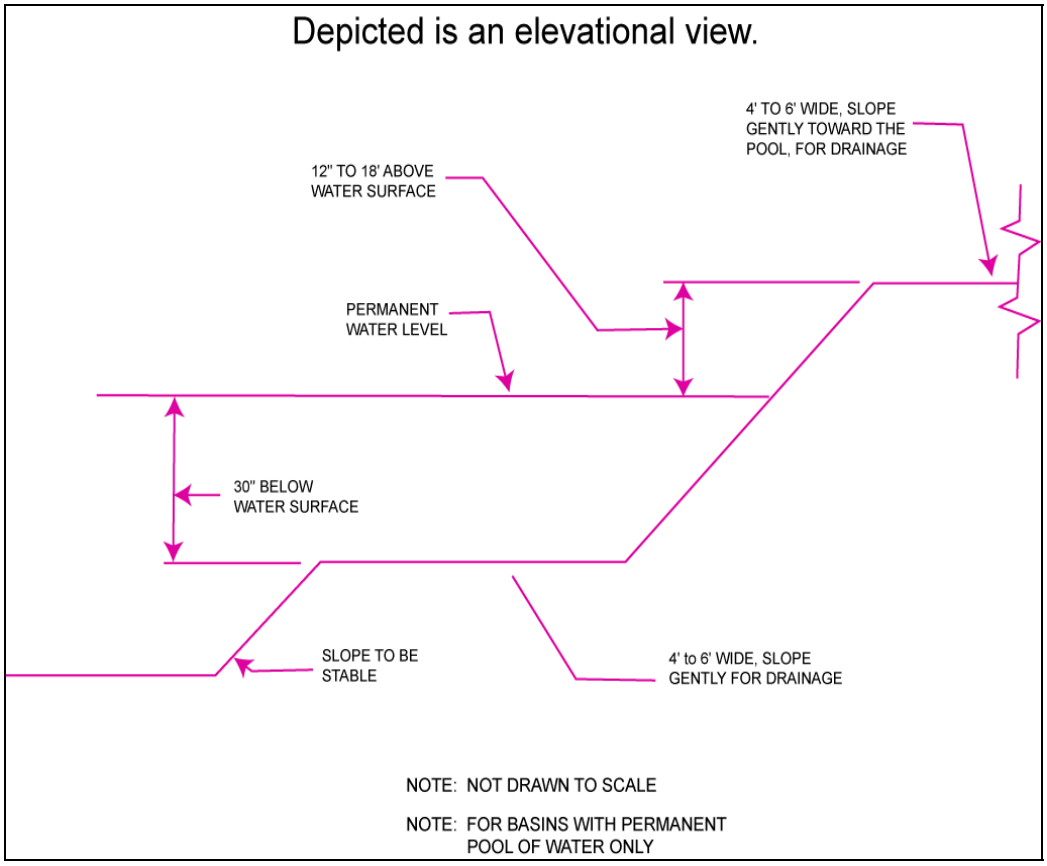
b. Safety ledges shall be constructed on the slopes of all new stormwater management basins having a permanent pool of water deeper than two and one-half feet. Such safety ledges shall be comprised of two steps. Each step shall be four to six feet in width. One step shall be located approximately two 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 interior slope for an earthen dam, embankment, or berm shall not be steeper than 3 horizontal to 1 vertical.

C. Variance or Exemption from Safety Standards

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.

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



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.

2. The applicant shall demonstrate that the project meets the standards set forth in this ordinance.

3. The applicant shall submit [*specify number*] copies of the materials listed in the checklist for site development stormwater plans in accordance with Section 9.C of this 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. That municipal board or official 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. Checklist Requirements

The following information shall be required:

1. Topographic Base Map

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 200 feet beyond the limits of the proposed development, at a scale of 1"=200' or greater, showing 2-foot contour intervals. The map as appropriate may indicate the following: existing surface water drainage, shorelines, steep slopes, soils, erodible soils, perennial or intermittent streams that drain into or upstream of the Category One waters, wetlands and flood plains along with their appropriate buffer strips, marshlands and other wetlands, pervious or vegetative surfaces, existing man-made structures, roads, bearing and distances of property lines, and significant natural and manmade features not otherwise shown.

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 sensitive features and to those that provide particular opportunities or constraints for development.

3. Project Description and Site Plan(s)

A map (or maps) at the scale of the topographical base map 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.

4. Land Use Planning and Source Control Plan

This plan shall provide a demonstration of how the goals and standards of Sections 3 through 6 are being met. The focus of this plan shall be to describe how the site is being developed to meet the objective of controlling groundwater recharge, stormwater quality and stormwater quantity problems at the source by land management and source controls whenever possible.

5. Stormwater Management Facilities Map

The following information, illustrated on a map of the same scale as the topographic base map, shall be included:

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, and details of the proposed plan to control and dispose of stormwater.

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.

6. Calculations

a. Comprehensive hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in Section 4 of this ordinance.

b. When the proposed stormwater management control measures (e.g., infiltration basins) depends 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.

7. Maintenance and Repair Plan

The design and planning of the stormwater management facility shall meet the maintenance requirements of Section 10.

8. Waiver from Submission Requirements

The municipal official or board reviewing an application under this ordinance 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 hardship on the applicant to obtain and its absence will not materially affect the review process.

Section 10: Maintenance and Repair

A. Applicability

1. Projects subject to review as in Section 1.C of this ordinance shall comply with the requirements of Sections 10.B and 10.C.

B. General Maintenance

1. The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development.

2. The maintenance plan shall contain specific preventative 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 preventative and corrective maintenance (including replacement). Maintenance guidelines for stormwater management measures are available in the New Jersey Stormwater Best Management Practices Manual. If the maintenance plan identifies a person other than the developer (for example, a public agency or homeowners' association) as having the responsibility for 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.

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.

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.

5. Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure, including repairs or replacement to the structure; 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.

6. The person responsible for maintenance identified under Section 10.B.2 above shall maintain a detailed log of all preventative 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.

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.

8. The person responsible for maintenance identified under Section 10.B.2 above shall retain 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.

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.

10. In the event that the stormwater management facility becomes a danger to public safety or public health, or if it 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.

B. 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.

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 a fine of $1000.00 per violation.

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 county review agency if the 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.

APPENDIX C - STORMWATER CONTROL ORDINANCE – PINELANDS JURISDICTIONAL AREAS

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STORMWATER
CONTROL ORDINANCE
FOR PINELANDS JURISDICTIONAL AREAS

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Section I. Scope and Purpose.

Purpose.

It is hereby determined that:

a) Land development projects and associated disturbance of vegetation and soil and changes in land cover, including increases in impervious cover, alter the hydrologic response of local watersheds and increase stormwater runoff rates and volumes. If inadequately or improperly managed, this stormwater runoff can deplete groundwater resources and increase flooding, stream channel erosion, and sediment transport and deposition.

b) This stormwater runoff contributes to increased quantities of waterborne pollutants.

c) Increases of stormwater runoff, soil erosion and nonpoint source pollutants have occurred in the past as a result of land development, and contribute to the degradation of the water resources of Toms River Township.

d) Certain lands of Toms River Township lie within the Pinelands Area, and therefore, development in this portion of Toms River Township is subject to the requirements of the Pinelands Protection Act (N.J.S.A. 13:18A-1 et seq.) and the implementing regulations and minimum standards contained in the Pinelands Comprehensive Management Plan (N.J.A.C. 7:50-1.1 et seq.) (CMP). The purpose and intent of these regulations and standards is to promote orderly development of the Pinelands so as to preserve and protect the significant and unique natural, ecological, agricultural, archaeological, historical, scenic, cultural and recreational resources of the Pinelands.

e) Pinelands Area resources are to be protected in accordance with Pinelands Comprehensive Management Plan at N.J.A.C. 7:50 et seq., New Jersey's Stormwater Management Rules at N.J.A.C. 7:8-1.1 et seq. and New Jersey's surface water quality antidegradation policies contained in the New Jersey Surface Water Quality Standards at N.J.A.C. 7:9B-1.1 et seq. Permitted uses shall maintain the ecological character and quality of the Pinelands, including good water quality and natural rates and volumes of flow.

f) Increased stormwater rates and volumes and the sediments and pollutants associated with stormwater runoff from future development projects within the Pinelands Area have the potential to adversely affect Toms River Township’s streams and water resources and the streams and water resources of downstream municipalities.

g) Stormwater runoff, soil erosion and nonpoint source pollution can be controlled and minimized through the regulation of stormwater runoff from development sites.

h) It is in the public interest to regulate the discharge of stormwater runoff from “major development” projects, as defined in Section VII of this ordinance, conducted within the Pinelands Area, as provided in this ordinance, in order to control and minimize increases in stormwater runoff rates and volumes, to maintain groundwater recharge, and to control and minimize soil erosion, stream

channel erosion and nonpoint source pollution associated with stormwater runoff.

Therefore, it is the purpose of this ordinance to establish minimum stormwater management requirements and controls for major development, consistent with the statewide stormwater requirements at N.J.A.C. 7:8, the regulations and standards contained in the Pinelands CMP, and the provisions of the adopted master plan and land use ordinances of Toms River Township.

Goals and Techniques.

Through this ordinance, Toms River Township has established the following goals for stormwater control:

a) To reduce flood damage, including damage to life and property;

b) To minimize any increase in stormwater runoff from new development;

c) To reduce soil erosion from any development or construction project;

d) To assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;

e) To maintain groundwater recharge;

f) To minimize any increase in nonpoint pollution;

g) To maintain the integrity of stream channels for their biological functions, as well as for drainage;

h) To restore, protect, maintain and enhance the quality of the streams and water resources of Toms River Township and the ecological character and quality of the Pinelands Area;

i) To minimize pollutants in stormwater runoff from new and existing development in order to restore, protect, enhance and maintain the chemical, physical and biological integrity of the surface and groundwaters of Toms River TownshiP, to protect public health and to enhance the domestic, municipal, recreational, industrial and other uses of water; and

j) To protect public safety through the proper design and operation of stormwater management basins.

In order to achieve the goals for stormwater control set forth in this ordinance, Toms River Township has identified the following management techniques:

a) Implementation of multiple stormwater management Best Management Practices (BMPs) may be necessary to achieve the performance standards for stormwater runoff quantity and rate, groundwater recharge, erosion control, and stormwater runoff quality established through this ordinance.

b) Compliance with the stormwater runoff quantity and rate, groundwater recharge, erosion control, and stormwater runoff quality standards established through N.J.A.C. 7:8-1.1 et seq., and this ordinance, shall be accomplished to the maximum extent practicable through the use of nonstructural BMPs, before

relying on structural BMPs. Nonstructural BMPs are also known as Low Impact Development (LID) techniques.

c) Nonstructural BMPs shall include both environmentally sensitive site design and source controls that prevent pollutants from being placed on the site or from being exposed to stormwater.

d) Source control plans shall be developed based upon physical site conditions and the origin, nature and the anticipated quantity or amount of potential pollutants.

e) Structural BMPs, where necessary shall be integrated with nonstructural stormwater management strategies and proper maintenance plans.

f) When using structural BMPs**,** multiple stormwater management measures, smaller in size and distributed spatially throughout the land development site, shall be used wherever possible to achieve the performance standards for water quality, quantity and groundwater recharge established through this ordinance before relying on a single, larger stormwater management measure to achieve these performance standards.

Applicability.

This ordinance shall apply to:

a) All site plans and subdivisions for major developments occurring within the Pinelands Area that require preliminary or final site plan or subdivision review; and

Procedures. In addition to other development review procedures set forth in the Code of Toms River Township, major developments located within the Pinelands Area shall comply with the stormwater management requirements and specifications set forth in this ordinance. New agricultural development that meets the definition of major development in Section VII of this ordinance shall be submitted to the appropriate Soil Conservation District for review and approval in accordance with the requirements of N.J.A.C. 5.4(b) 7:8.

Compatibility with Other Permit and Ordinance Requirements.

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 ordinance, code, rule, regulation, statute, act or other provision of law.

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 is not intended to interfere with, abrogate, or annul any other ordinances, rule or regulation, statute, or other provision of law except that, where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, the more restrictive or stringent provisions or higher standards shall control.

In the event that a regional stormwater management plan(s) is prepared and formally adopted pursuant to N.J.A.C. 7:8-1.1 et seq. for any drainage area(s) or watershed(s) of which Toms River Township is a part, the stormwater provisions of such a plan(s) shall be adopted by Toms River Township within one year of the adoption of a Regional Stormwater Management Plan (RSWMP) as an amendment to an Areawide Water Quality Management Plan. Local ordinances proposed to implement the RSWMP shall be submitted to the Commission for certification within six months of the adoption of the RSWMP per N.J.A.C. 7:8 and the Pinelands CMP (N.J.A.C. 7:50.)

Section II. Requirements for a Site Development Stormwater Plan.

A. Submission of Site Development Stormwater Plan.

1. Whenever an applicant seeks municipal approval of a site development that is subject to this ordinance, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section II.C below as part of the applicant's application for subdivision or site plan approval. These required components are in addition to any other information required under any provisions of Toms River Township's land use ordinance or by the Pinelands Commission pursuant to N.J.A.C. 7:50-1.1 et seq.
2. The applicant shall demonstrate that the site development project meets the standards set forth in this ordinance.
3. The applicant shall submit two (2) copies of the materials listed in the checklist for site development stormwater plans in accordance with Section III.C of this ordinance.

B. Site Development Stormwater Plan Approval.

1. The applicant's site development stormwater plan shall be reviewed as a part of the subdivision or site plan review process by the municipal board or official from whom municipal approval is sought. That municipal board or official 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. Checklist Requirements. Any application for approval of a major development shall include at least the following information. All required engineering plans shall be submitted to the Toms River Township and the Pinelands Commission in an AutoCAD Compatible Format or higher, registered and rectified to NJ State Plane Feet NAD 83 or Shape Format NJ State Plan Feet NAD 83, and all other documents shall be submitted in both paper and commonly used electronic file formats such as pdf., word processing, database or spreadsheet files. Three (3) copies[2] of each item shall be submitted.

1. Topographic Base Map. The applicant shall submit a topographic base map of the site which extends a minimum of three hundred (300) feet beyond the limits of the proposed development, at a scale of one (1) inch = two hundred (200) feet or greater, showing one (1) foot contour intervals. The map shall indicate the following: existing surface water drainage, shorelines, steep slopes, soils, highly erodible soils, perennial or intermittent streams that drain into or upstream of any Category One or Pinelands Waters, wetlands and floodplains along with their appropriate buffer strips, marshlands and other wetlands, pervious or vegetative surfaces, existing surface and subsurface human-made structures, roads, bearing and distances of property lines, and significant natural and manmade features not otherwise shown. Toms River Township or the Pinelands Commission may require upstream tributary drainage system information as necessary.

2. Environmental Site Analysis. The applicant shall submit a written description along with the drawings of the natural and human-made features of the site and its environs. This description should include:

    a) A discussion of environmentally critical areas, soil conditions, slopes, wetlands, waterways and vegetation on the site. Particular attention should be given to unique, unusual or environmentally sensitive features and to those that provide particular opportunities for or constraints on development; and

    b) Detailed soil and other environmental conditions on the portion of the site proposed for installation of any stormwater BMPs, including, at a minimum: soils report based on onsite soil tests; locations and spot elevations in plan view of test pits and permeability tests; permeability test data and calculations; and any other required soil data (e.g., mounding analyses results) correlated with location and elevation of each test site; cross-section of proposed stormwater BMP with side-by-side depiction of soil profile drawn to scale and seasonal high water table elevation identified; and any other information necessary to demonstrate the suitability of the specific proposed structural and nonstructural stormwater management measures relative to the environmental conditions on the portion(s) of the site proposed for implementation of those measures.

3. Project description and site plan(s). The applicant shall submit a map (or maps) at the scale of the topographical base map 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 will occur in the natural terrain and cover, including lawns and other landscaping, and seasonal high groundwater elevations. A written description of the site plan and justification for proposed changes in natural conditions shall also be provided.

4. Land Use Planning and Source Control Plan.

    a) The applicant shall submit a detailed Land Use Planning and Source Control Plan which provides a description of how the site will be developed to meet the erosion control, groundwater recharge and stormwater runoff quantity and quality standards at Section IV through use of nonstructural or low impact development techniques and source controls to the maximum extent practicable before relying on structural BMPs. The Land Use Planning and Source Control Plan shall include a detailed narrative and associated illustrative maps and/or plans that specifically address how each of the following nine (9) nonstructural strategies identified in Subchapter 5 of the NJDEP Stormwater Management Rules (N.J.A.C. 7:8-5) and set forth below (4.a. i. through ix.) will be implemented to the maximum extent practicable to meet the standards at Section IV of this ordinance on the site. If one or more of the nine (9) nonstructural strategies will <u>not</u> be implemented on the site, the

applicant shall provide a detailed rationale establishing a basis for the contention that use of the strategy is not practicable on the site.

i. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;

ii. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;

iii. Maximize the protection of natural drainage features and vegetation;

iv. Minimize the decrease in the pre-development “time of concentration”;

v. Minimize land disturbance including clearing and grading;

vi. Minimize soil compaction and all other soil disturbance;

vii. Provide low-maintenance landscaping that provides for the retention and planting of native plants and minimizes the use of lawns, fertilizers and pesticides, in accordance with N.J.A.C. 7:50-6.24;

viii. Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas; and

ix. Provide other source controls to prevent or minimize the use or exposure of pollutants at the site in order to prevent or minimize the release of those pollutants into stormwater runoff. These source controls shall include, but are not limited to:

(1) Site design features that help to prevent accumulation of trash and debris in drainage systems;

(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) Applying 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, when establishing vegetation after land disturbance.

b) For sites where stormwater will be generated from “high pollutant loading areas” or where stormwater will be exposed to “source material,” as defined in Section VII of this ordinance, the applicant shall also demonstrate in the Land Use Planning and Source Control Plan that the requirements of Section IV have been met.

c) The use of nonstructural strategies to meet the performance standards in Section IV of this ordinance is <u>not</u> required for development sites creating less

than one (1) acre of disturbance. However, each application for major development and any other application where Toms River Township otherwise requires a landscaping plan shall contain a landscaping or revegetation plan in accordance with the CMP standards at N.J.A.C. 7:50-6.24(c). In addition, the applicant shall demonstrate that, at a minimum, existing trees and vegetation on the development site will be preserved and protected according to the minimum standards established by provisions of the Toms River Township Land Use Ordinance, Zoning Ordinance or by conditions of zoning or variance approval.

5. Stormwater Management Facilities Map. The applicant shall submit a map, at the same scale as the topographic base map, depicting the following information:
   i. The total area to be disturbed, paved and/or built upon, proposed surface contours, land area to be occupied by the stormwater management facilities and the type of vegetation thereon, and details of the proposed plan to manage and dispose of stormwater; and
   ii. Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention (if applicable) and emergency spillway provisions with maximum discharge capacity of each spillway.
6. Calculations (groundwater recharge and stormwater runoff rate, volume and quality). The applicant shall submit comprehensive hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in Section III. The standards for groundwater recharge and stormwater runoff rate, volume and quality required by Section IV shall be met using the methods, calculations and assumptions provided in Section III.
7. Inspection, Maintenance and Repair Plan. The applicant shall submit a detailed plan describing how the proposed stormwater management measure(s) shall meet the maintenance and repair requirements of Section VI of this ordinance. Said plan shall include, at a minimum, the following elements:
   a) The frequency with which inspections will be made;
   b) The specific maintenance tasks and requirements for each proposed structural and nonstructural BMP;
   c) The name, address and telephone number for the entity responsible for implementation of the maintenance plan;
   d) The reporting requirements; and
   e) Copies of the inspection and maintenance reporting sheets.
8. Exception from submission requirements. An exception may be granted from submission of any of these required components (except 7. above, Inspection, Maintenance, and Repair Plan) if its absence will not materially affect the review process. However, items required pursuant to the application requirements in the Pinelands CMP (N.J.A.C. 7:50-4.2(b)) shall be submitted to the NJ Pinelands

Commission unless the Executive Director waives or modifies the application requirements.

Section III. Methodologies for the Calculation of Stormwater Runoff Rate and Volume, Stormwater Runoff Quality, and Groundwater Recharge.

A. Method of Calculating Stormwater Runoff Rate and Volume.

1. In complying with the Stormwater Runoff Quantity and Rate Standards in Section IV.B, the design engineer shall calculate the stormwater runoff rate and volume using the USDA Natural Resources Conservation Service (NRCS) Runoff Equation, Runoff Curve Numbers, and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Part 630 – Hydrology and Technical Release 55 – Urban Hydrology for Small Watersheds, incorporated herein by reference, as amended and supplemented. Alternative methods of calculation may be utilized, provided such alternative methods are at least as protective as the NRCS methodology when considered on a regional stormwater management basis.

2. 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 each drainage area within the parcel.

3. Calculation of stormwater runoff from unconnected impervious surfaces shall be based, as applicable, upon the Two-Step method described in the current New Jersey Stormwater Best Management Practices Manual or the NRCS methodology.

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, available online at http://hdsc.nws.noaa.gov/hdsc/pfds/index.html.

5. When calculating stormwater runoff for pre-developed site conditions, the design engineer shall use the following criteria:

   a) When selecting or calculating Runoff Curve Numbers (CNs) for pre-developed project site conditions, the project site's land cover shall be assumed to be woods in good condition. However, another land cover may be used to calculate runoff coefficients if:

      i. Such land cover has existed at the site or portion thereof without interruption for at least five (5) years immediately prior to the time of application; and

      ii. 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.

   b) If more than one land cover has existed on the site during the five (5) years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations.

   c) All pre-developed land covers shall be assumed to be in good hydrologic condition and, if cultivated, shall be assumed to have conservation treatment.

   d) 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 affect pre-developed site stormwater runoff rates and/or volumes.

e) 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. Method of Calculating Stormwater Runoff Quality.

1. In complying with the Stormwater Runoff Quality Standards in Section IV.F.1, the design engineer shall calculate the stormwater runoff rate and volume using the USDA Natural Resources Conservation Service (NRCS) Runoff Equation, Runoff Curve Numbers, and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Part 630 – Hydrology and Technical Release 55 – Urban Hydrology for Small Watersheds, as amended and supplemented.

2. The design engineer shall also use the NJDEP Water Quality Design Storm, which is one and one-quarter (1.25) inches of rainfall falling in a nonlinear pattern in two (2) hours. Details of the Water Quality Design Storm are shown in Table 1.

3. Calculation of runoff volumes, peak rates, and hydrographs for the Water Quality Design Storm may take into account the implementation of nonstructural and structural stormwater management measures.

Table 1: Water Quality Design Storm Distribution[1]

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		

[1] Source: N.J.A.C. 7:8-5.5(a).

4. Total Suspended Solids (TSS) reduction calculations.

   i. If more than one stormwater BMP in series is necessary to achieve the required eighty percent (80%) TSS reduction for a site, the applicant shall utilize the following formula to calculate TSS reduction:

      R = A + B – (A x B) / 100, where:

         R = total TSS percent load removal from application of both BMPs;
         A = the TSS percent removal rate applicable to the first BMP; and
         B = the TSS percent removal rate applicable to the second BMP.

   ii. If there is more than one onsite drainage area, the eighty percent (80%) TSS removal rate shall apply to each drainage area, unless the runoff from the subareas converge on site, in which case the removal rate can be demonstrated through a calculation using a weighted average.

5. TSS removal rates for stormwater BMPs.

   a) For purposes of TSS reduction calculations, Table 2 presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey BMP Manual. The BMP Manual may be obtained from the address identified in Section XII.A or found on the NJDEP's website at www.njstormwater.org. TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2

   b) Alternative stormwater management measures, removal rates and methods of calculating removal rates may be used if the design engineer provides documentation demonstrating the capability of these alternative rates and methods to Toms River TownshiP. Any alternative stormwater management measure, removal rate or method of calculating the removal rate shall be subject to approval by Toms River Township and a copy shall be provided to the following:

      i. The Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418 Trenton, NJ, 08625-0418; and

      ii. The New Jersey Pinelands Commission, PO Box 7, New Lisbon, NJ, 08064.

Table 2: Pollutant Removal Rates for BMPs2			
Best Management Practice	**TSS Percent Removal Rate**	**Total Phosphorus Percent Removal Rate**	**Total Nitrogen Percent Removal Rate**
Bioretention Systems	90	60	30
Constructed Stormwater Wetland	90	50	30
Extended Detention Basin	40-60 (final rate based upon detention time; see New Jersey BMP Manual, Chap. 9)	20	20
Infiltration basin	80	60	50
Manufactured Treatment Device	Pollutant removal rates as certified by NJDEP; see Section III.	Pollutant removal rates as certified by NJDEP; see Section III.	Pollutant removal rates as certified by NJDEP; see Section III.
Pervious Paving Systems	80 (porous paving)	60	50
	80 (permeable pavers with storage bed)		
	0 - volume reduction only (permeable pavers without storage bed)	0 - volume reduction only (permeable pavers without storage bed)	0 - volume reduction only (permeable pavers without storage bed)
Sand Filter	80	50	35
Vegetative Filter Strip (For filter strips with multiple vegetated covers, the final TSS removal rate should be based upon a weighted average of the adopted rates shown in Table 2, based upon the relative flow lengths through each cover type.)	60 (turf grass)	30	30
	70 (native grasses, meadow and planted woods)		
	80 (indigenous woods)		
Wet Pond / Retention Basin	50-90 (final rate based upon pool volume and detention time; see NJ BMP Manual)	50	30

[2] Source: 7:8-5.5(c) and New Jersey BMP Manual Chapter 4.

6. Nutrient removal rates for stormwater BMPs. For purposes of post-development nutrient load reduction calculations, Table 2 presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey BMP Manual. If alternative stormwater BMPs are proposed, the applicant shall demonstrate that the selected BMPs will achieve the nutrient removal standard required in Section IV.F.

C. Methods of Calculating Groundwater Recharge.

1. In complying with the groundwater recharge requirements in Section IV.C.1.a, the design engineer may calculate groundwater recharge in accordance with the New Jersey Groundwater Recharge Spreadsheet (NJGRS) computer program incorporated herein by reference as amended and supplemented. Information regarding the methodology is available in Section XI.A or from the New Jersey BMP Manual.
2. Alternative groundwater recharge calculation methods to meet these requirements may be used upon approval by the municipal engineer.
3. In complying with the groundwater recharge requirements in Section IV.C.1.b, the design engineer shall:
   a) Calculate stormwater runoff volumes in accordance with the USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Runoff Curve Numbers, as described in the NRCS National Engineering Handbook Part 630 – Hydrology and Technical Release 55 – Urban Hydrology for Small Watersheds as amended and supplemented; and
   b) Use appropriate 2-year, 24-hour rainfall depths as developed for the project site by the National Oceanic and Atmospheric Administration, available online at http://hdsc.nws.noaa.gov/hdsc/pfds/index.html.
4. When calculating groundwater recharge or stormwater runoff for pre-developed site conditions, the design engineer shall use the following criteria:
   a) When selecting land covers or calculating Runoff Curve Numbers (CNs) for pre-developed project site conditions, the project site's land cover shall be assumed to be woods. However, another land cover may be used to calculate runoff coefficients if:
      i. Such land cover has existed at the site or portion thereof without interruption for at least five (5) years immediately prior to the time of application; and
      ii. 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.
   b) If more than one land cover, other than woods, has existed on the site during the five (5) years immediately prior to the time of application, the land cover with the lowest runoff potential (including woods) shall be used for the computations.

c) All pre-developed land covers shall be assumed to be in good hydrologic condition and, if cultivated, shall be assumed to have conservation treatment.

Section IV. Stormwater Management Performance Standards for Major Development.

A. Nonstructural Stormwater Management Strategies.

1. To the maximum extent practicable, the performance standards in Section IV for major development shall be met by incorporating the nine (9) nonstructural strategies identified in Subchapter 5 of the NJ Stormwater Management Rules (N.J.A.C. 7:8-5), and set forth in Section II.C.4.a, into the design. The applicant shall identify within the Land Use Planning and Source Control Plan required by Section II.C.4 of this ordinance how each of the nine (9) nonstructural measures will be incorporated into the design of the project to the maximum extent practicable.

2. If the applicant contends that it is not practical for engineering, environmental or safety reasons to incorporate any of the nine (9) nonstructural strategies into the design of a particular project, the applicant shall provide a detailed rationale establishing a basis for the contention that use of the strategy is not practical on the site. This rationale shall be submitted in accordance with the Checklist Requirements established by Section II to Toms River Township. A determination by Toms River Township that this rationale is inadequate or without merit shall result in a denial of the application unless one of the following conditions are met:

   a) The Land Use Planning and Source Control Plan is amended to include a description of how all nine (9) nonstructural measures will be implemented on the development site, and the amended Plan is approved by Toms River Township;

   b) The Land Use Planning and Source Control Plan is amended to provide an alternative nonstructural strategy or measure that is not included in the list of nine (9) nonstructural measures, but still meets the performance standards in Section IV, and the amended Plan is approved by Toms River Township; or

   c) The Land Use Planning and Source Control Plan is amended to provide an adequate rationale for the contention that use of the particular strategy is not practical on the site, and the amended Plan is approved by Toms River Township.

3. In addition to all other requirements of this section, each applicant shall demonstrate that, at a minimum, existing trees and vegetation on the development site will be preserved, protected and maintained according to the minimum standards established by provisions of the Toms River Township Land Use Ordinance, Zoning Ordinance or by conditions of zoning or variance approval. Existing trees and vegetation shall be protected during construction activities in accordance with the “Standard for Tree Protection During Construction” provided in the NJ State Soil Conservation Committee Standards for Soil Erosion and Sediment Control in New Jersey, which is incorporated herein by reference as amended and supplemented.

4. In addition to all other requirements of this section, each application for major development, and any other application where Toms River Township otherwise

requires a landscaping plan, shall contain a landscaping or revegetation plan in accordance with the Pinelands CMP standards at N.J.A.C. 7:50-6.24(c).

5. Any land area used as a nonstructural stormwater management measure to meet the performance standards in Section IV shall be dedicated to a government entity; shall be subjected to a conservation easement filed with the appropriate County Clerk's office; or shall be subjected to an equivalent form of restriction approved by Toms River Township that ensures that that measure, or equivalent stormwater management measure is maintained in perpetuity, as detailed in Section VI of this ordinance.

6. Guidance for nonstructural stormwater management strategies is available in the New Jersey BMP Manual, which may be obtained from the address identified in Section XII.A or found on the NJDEP's website at www.njstormwater.org.

7. Exception for major development sites creating less than one (1) acre of disturbance. The use of nonstructural strategies to meet the performance standards in Section IV of this ordinance is not required for major development creating less than one (1) acre of disturbance. However, the following requirements shall be met:

   a) Each application for major development and any other application where Toms River Township otherwise requires a landscaping plan shall contain a landscaping or revegetation plan prepared in accordance with the Pinelands CMP standards (N.J.A.C. 7:50-6.24(c));

   b) Each applicant shall demonstrate that, at a minimum, existing trees and vegetation on the development site will be preserved and protected according to the minimum standards established by provisions of the Toms River Township Land Use Ordinance, Zoning Ordinance or by conditions of zoning or variance approval; and

   c) Existing trees and vegetation shall be protected during construction activities in accordance with the "Standard for Tree Protection During Construction" provided in the NJ State Soil Conservation Committee Standards for Soil Erosion and Sediment Control in New Jersey, which is incorporated herein by reference as amended and supplemented.

B. Stormwater Runoff Quantity and Rate Standards.

1. There shall be no direct discharge of stormwater runoff from any point or nonpoint source to any wetland, wetlands transition area or surface waterbody. In addition, stormwater runoff shall not be directed in such a way as to increase the volume and/or rate of discharge into any surface water body from that which existed prior to development of the site.

2. To the maximum extent practical, there shall be no direct discharge of stormwater runoff onto farm fields so as to protect farm crops from damage due to flooding, erosion and long-term saturation of cultivated crops and cropland.

3. For all major developments, the total runoff volume generated from the net increase in impervious surfaces by a ten (10) year, twenty-four (24) hour storm shall be retained and infiltrated onsite.

4. In addition, the design engineer, using the assumptions and factors for stormwater runoff and groundwater recharge calculations contained in Section III, shall either:

   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:

      i. There is no increase in pre-developed stormwater runoff rates from the project site for the two (2), ten (10), and one hundred (100)-year storms; and

      ii. Any increased stormwater runoff volume or change in stormwater runoff timing for the two (2), ten (10), and one hundred (100)-year storms will not increase flood damage at or downstream of the project site. When performing this analysis for pre-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; or

   c) Demonstrate that the peak post-developed stormwater runoff rates from the project site for the two (2), ten (10) and one hundred (100) year storms are fifty, seventy-five and eighty percent (50%, 75% and 80%), respectively, of the site's peak pre-developed stormwater runoff rates for the same storms. Peak outflow rates from onsite stormwater measures 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. These 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:

      i. Protected from future development by imposition of a conservation easement, deed restriction, or other acceptable legal measures; or

      ii. Would be subject to review under these standards if they are proposed for any degree of development in the future.

5. In tidal flood hazard areas, a stormwater runoff quantity analysis in accordance with a, b, and c above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.

6. The standards for stormwater runoff quantity and rate required by this section shall be met using the methods, calculations and assumptions provided in Section III.

C. Groundwater Recharge Standards.

1. For all major developments, with the exception of those described in Section IV.C.4, below, the design engineer, using the assumptions and factors for

stormwater runoff and groundwater recharge calculations contained in Section III, shall either:

a) Demonstrate through hydrologic and hydraulic analysis that the post-developed project site maintains 100 percent of the site's pre-developed average annual groundwater recharge volume; or

b) Demonstrate through hydrologic and hydraulic analysis that any increase in the project site's stormwater runoff volume for the two (2) year, twenty four (24) hour storm from pre-developed to post-developed conditions is infiltrated on-site.

2. The design engineer shall assess the hydraulic impact on the groundwater table and design the project site and all site groundwater recharge measures so as to avoid adverse hydraulic impacts. Adverse hydraulic impacts include, but are not limited to: raising the groundwater table so as to cause surface ponding; flooding of basements and other subsurface structures and areas; preventing a stormwater infiltration basin from completely draining via infiltration within seventy-two (72) hours of a design storm event; and interference with the proper operation of subsurface sewage disposal systems and other surface and subsurface facilities in the vicinity of the groundwater recharge measure.

3. The standards for groundwater recharge required by this section shall be met using the methods, calculations and assumptions provided in Section III.

4. Exceptions. *The municipality may choose to remove this exception in their adoption of this ordinance.*

a) The preceding groundwater recharge standards shall not apply to sites that create less than one (1) acre of disturbance.

D. Erosion Control Standards. 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 its implementing regulations, N.J.A.C 2:90-1.1 through 1.4.

E. Stormwater Runoff Quality Standards.

1. There shall be no direct discharge of stormwater runoff from any point or nonpoint source to any wetland, wetland transition area or surface waterbody.

2. Stormwater management measures shall be designed to reduce the total suspended solids (TSS) load in the stormwater runoff from the post-developed site by eighty percent (80%) expressed as an annual average.

3. Stormwater management measures shall also be designed to reduce the nutrient load in the stormwater runoff from the post-developed site by the maximum extent practicable. In achieving this reduction, the design of the development site shall include nonstructural and structural stormwater management measures that optimize nutrient removal while still achieving the groundwater recharge, runoff quantity and rate, and TSS removal standards in this section.

4. The standards for stormwater runoff quality required by this section shall be met using the methods, calculations, assumptions and pollutant removal rates provided in Section III.

5. Exceptions.

   a) The preceding stormwater runoff quality standards shall not apply to the following major development sites:

      i. Major development sites where less than one quarter (0.25) acre of additional impervious surface is proposed; or

      ii. Major residential development sites that create less than one (1) acre of disturbance.

   b) The TSS reduction requirement in Section IV.F.2 shall not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the NJPDES rules (N.J.A.C. 7:14A) or in a discharge specifically exempt under a NJPDES permit from this requirement.

   c) The stormwater runoff quantity and rate standards in Section IV.B shall still be met for all major development sites.

F. <u>Additional stormwater quality standards for high pollutant loading areas and areas where stormwater runoff is exposed to source material</u>.

1. This subsection applies to the following areas of a major development as defined in Section VII of this ordinance:

   a) High pollutant loading areas (HPLAs); and

   b) Areas where stormwater is exposed to “source material.”

2. For a major development in areas described in 1.a or 1.b above, in addition to the infiltration requirements specified in Section IV.B.2 and the groundwater recharge requirements specified in Section IV.C, the applicant shall demonstrate in the Land Use Planning and Source Control Plan required in Section II.C.4 that the following requirements have been met:

   a) The extent of the areas described in 1.a. and 1.b. above have been minimized on the development site to the maximum extent practicable;

   b) The stormwater runoff from the areas described in 1.a and 1.b above is segregated to the maximum extent practicable from the stormwater runoff generated from the remainder of the site such that co-mingling of the stormwater runoff from the areas described in 1.a and 1.b above and the remainder of the site will be minimized;

   c) The amount of precipitation falling directly on the areas described in 1.a and 1.b above is minimized to the maximum extent practicable by means of a canopy, roof or other similar structure that reduces the generation of stormwater runoff; and

d) The stormwater runoff from or co-mingled with the areas described in 1.a and 1.b above for the Water Quality Design Storm, defined in Section III.B.Table 1 shall be subject to pretreatment by one or more of the following stormwater BMPs, designed in accordance with the New Jersey BMP Manual to provide 90 % TSS removal:

i. Bioretention system;

ii. Sand filter;

iii. Wet ponds which shall be hydraulically disconnected by a minimum of 2 feet of vertical separation from the seasonal high water table and shall be designed to achieve a minimum 80% TSS removal rate;

iv. Constructed stormwater wetlands*;* and/or

v. Media filtration system manufactured treatment device with a minimum 80% TSS removal as verified by the New Jersey Corporation for Advanced Technology and as certified by NJDEP.

e) If the potential for contamination of stormwater runoff by petroleum products exists onsite, prior to being conveyed to the pretreatment BMP required in Section IV.D.2.d above, the stormwater runoff from the areas described in 1.a and 1.b above shall be conveyed through an oil/grease separator or other equivalent manufactured filtering device to remove the petroleum hydrocarbons. The applicant shall provide the reviewing agency with sufficient data to demonstrate acceptable performance of the device.

G. Threatened and Endangered Species and Associated Habitat Standards. Stormwater management measures shall address the impacts of the development on habitat for threatened and endangered species, in accordance with N.J.A.C. 7:8-5.2(c), N.J.A.C. 7:50-6.27, and 7:50-6.33 and 34.

H. Exceptions and Mitigation Requirements.

1. Exceptions from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements established by this ordinance may be granted, at the discretion of the Toms River TownshiP, and subject to approval by the Pinelands Commission, provided that all of the following conditions are met:
   a) The exception is consistent with that allowed by Toms River TownshiP;
   b) Toms River Township has an adopted and effective municipal stormwater management plan in accordance with N.J.A.C. 7:8-4.4, which includes a mitigation plan in accordance with N.J.A.C. 7:8-4.2(c) 11, and is also certified by the Pinelands Commission. The mitigation plan shall identify what measures are necessary to offset the deficit created by granting the exception and the municipality shall submit a written report to the county review agency and the NJDEP describing the exception and the required mitigation. Guidance for developing municipal stormwater management plans, including mitigation plans, is available from the NJDEP, Division of Watershed Management and the New Jersey BMP Manual.

c) The applicant demonstrates that mitigation, in addition to the requirements of mitigation plan discussed in b) above, will be provided consistent with one of the following options:

i. Mitigation may be provided off-site, but within the Pinelands Area and within the same drainage area as the development site, and shall meet or exceed the equivalent recharge, quality or quantity performance standard which is lacking on the development site due to the exception; or

ii. In lieu of the required mitigation, a monetary "in lieu contribution" may be provided by the applicant to Toms River Township in accordance with the following:

(a) The amount of the in lieu contribution shall be determined by Toms River TownshiP, but the maximum in lieu contribution required shall be equivalent to the cost of implementing and maintaining the stormwater management measure(s) for which the exception is granted;

(b) The in lieu contribution shall be used to fund an off-site stormwater control mitigation project(s) located within the Pinelands Area, within the same drainage area as the development site, and shall meet or exceed the equivalent recharge, quality or quantity performance standards which is lacking on the development site. Such mitigation project shall be identified by Toms River Township in Toms River TownshiP's adopted municipal stormwater management plan. The stormwater control project to which the monetary contribution will be applied shall be identified by Toms River Township at the time the exception is granted. The applicant shall amend the project description and site plan required in Section II.C.3 to incorporate a description of both the standards for which an on-site exception is being granted and of the selected off-site mitigation project.

(c) Toms River Township shall expend the in lieu contribution to implement the selected off-site mitigation project within five (5) years from the date that payment is received. Should Toms River Township fail to expend the in lieu contribution within the required timeframe, the mitigation option provided in Section IV.H.1.c.iii of this ordinance shall be void and Toms River Township shall be prohibited from collecting in lieu contributions.

2. An exception from strict compliance granted in accordance with H.1. above shall not constitute a waiver of strict compliance from the requirements of the Pinelands Comprehensive Management Plan at N.J.A.C. 7:50. An applicant should contact the Pinelands Commission to determine whether a waiver of strict compliance is also required in accordance with N.J.A.C. 7:50, Subchapter 4, Part V.

Section V. Design, Construction, and Safety Standards for Structural Stormwater Management Measures

A. General Design and Construction Standards

1. Structural stormwater management measures shall be designed to meet the standards established in this section. These standards have been developed to protect public safety, conserve natural features, create an aesthetically pleasing site and promote proper onsite stormwater management.
2. The following structural stormwater management measures may be utilized as part of a stormwater management system at a major land development in the Pinelands, provided that the applicant demonstrates that they are designed, constructed and maintained so as to meet the standards and requirements established by this ordinance. If alternative stormwater management measures are proposed, the applicant shall demonstrate that the selected measures will achieve the standards established by this ordinance.
    a) Bioretention systems;
    b) Constructed stormwater wetlands;
    c) Extended detention basins;
    d) Infiltration basins;
    e) Vegetated filter strips;
    f) Infiltration basins and trenches;
    g) Wet ponds with suitable liners**;**
    h) Pervious paving systems; and
    i) Manufactured treatment devices, provided their pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the NJDEP.
3. Structural stormwater management measures shall be designed to take into account the existing site conditions, including environmentally critical areas, wetlands, flood-prone areas, slopes, depth to seasonal high water table, soil type, permeability and texture, and drainage area and drainage patterns. All basins shall comply with the safety standards promulgated under NJAC 7:8-6.
4. Structural stormwater management measures shall be designed and constructed 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 7.8 shall be deemed to meet this requirement); to minimize and facilitate maintenance and repairs; and to ensure proper functioning.
5. For all stormwater management measures at a development site, each applicant shall submit a detailed Inspection, Maintenance and Repair Plan consistent with the requirements of Section V of this ordinance.

6. To the maximum extent practicable, the design engineer shall design structural stormwater management measures on the development site in a manner that:
   a) Limits site disturbance, maximizes stormwater management efficiencies, and maintains or improves aesthetic conditions;
   b) Utilizes multiple stormwater management measures, smaller in size and distributed spatially throughout the land development site, instead of a single larger structural stormwater management measure;
   c) Incorporates pretreatment measures. Pretreatment can extend the functional life and increase the pollutant removal capability of a structural stormwater management measure. Pretreatment measures may be designed in accordance with the New Jersey BMP Manual or other sources approved by the municipal engineer.
7. Stormwater management basins shall be designed in a manner that complements and mimics the existing natural landscape, including but not limited to the following design strategies:
   a) Use of natural, non-wetland wooded depressions for stormwater runoff storage; and
   b) Establishment of attractive landscaping in and around the basin that mimics the existing vegetation and incorporates native Pinelands plants, including, but not limited to, the species listed in N.J.A.C. 7:50-6.25 and 6.26.
8. Stormwater management basins shall be designed with gently sloping sides. The maximum allowable basin side slope shall be three (3) horizontal to one (1) vertical (3:1). All basins shall comply with the safety standards promulgated under NJAC 7:8-6.
9. Guidance on the design and construction of structural stormwater management measures may be found in the New Jersey BMP Manual. Other guidance sources may also be used upon approval by the municipal engineer.
10. After all construction activities and required field testing have been completed on the development site, as-built plans depicting design and as-built elevations of all stormwater management measures shall be prepared by a Licensed Land Surveyor and submitted to the municipal engineer. Based upon the municipal engineer's review of the as-built plans, all corrections or remedial actions deemed by the municipal engineer to be necessary due to the failure to comply with the standards established by this ordinance and/or any reasons of public health or safety shall be completed by the applicant. In lieu of review by the municipal engineer, Toms River Township reserves the right to engage a Professional Engineer to review the as-built plans. The applicant shall pay all costs associated with such review.

B. Design and Construction Standards for Stormwater Infiltration BMP's.

1. Stormwater infiltration BMP's, such as bioretention systems with infiltration, dry wells, infiltration basins, pervious paving systems with storage beds, and sand filters with infiltration, shall be designed, constructed and maintained to completely drain the total runoff volume generated by the basin's maximum design storm within seventy-two (72) hours after a storm event. Runoff storage for greater times can render the BMP ineffective and may result in anaerobic conditions, odor and both water quality and mosquito breeding problems.

2. Stormwater infiltration BMPs shall be designed, constructed and maintained to provide a minimum separation of at least two (2) feet between the elevation of the lowest point of the bottom of the infiltration BMP and the seasonal high water table.

3. A stormwater infiltration BMP shall be sited in suitable soils verified by field testing to have permeability rates between one (1) and twenty (20) inches per hour. If such site soils do not exist or if the design engineer demonstrates that it is not practical for engineering, environmental or safety reasons to site the stormwater infiltration BMP(s) in such soils, then the stormwater infiltration BMP(s) may be sited in soils verified by field testing to have permeability rates in excess of twenty (20) inches per hour, provided that a bioretention system, designed, installed and maintained in accordance with the New Jersey BMP Manual, is installed to meet one of the following conditions:

   a) The bioretention system is constructed as a separate measure designed to provide pretreatment of stormwater and to convey the pretreated stormwater into the infiltration BMP; or

   b) The bioretention system is integrated into and made part of the infiltration BMP and, as such, does not require an underdrain system. If this option is selected, the infiltration BMP shall be designed and constructed so that the maximum water depth in the bioretention system portion of the BMP during treatment of the stormwater quality design storm is twelve (12) inches in accordance with the New Jersey BMP Manual.

4. The minimum design permeability rate for the soil within a BMP that relies on infiltration shall be one-half (0.5) inch per hour. A factor of safety of two (2) shall be applied to the soil's field-tested permeability rate to determine the soil's design permeability rate. For example, if the field-tested permeability rate of the soil is four (4) inches per hour, its design permeability rate would be two (2) inches per hour). The minimum design permeability rate for the soil within a stormwater infiltration basin shall also be sufficient to achieve the minimum seventy-two (72) hour drain time described in 1. above. The maximum design permeability shall be ten (10) inches per hour.

5. A soil's field tested permeability rate shall be determined in accordance with the following:

   a) The pre-development field test permeability rate shall be determined according to the methodologies provided in Section XI.C.3 of this ordinance;

   b) The results of the required field permeability tests shall demonstrate a minimum tested infiltration rate of one (1) inch per hour;

   c) After all construction activities have been completed on the site and the finished grade has been established in the infiltration BMP, post-development field permeability tests shall also be conducted according to the methodologies provided in Section XI.C.3 of this ordinance;

   d) If the results of the post-development field permeability tests fail to achieve the minimum required design permeability rates in 5 above utilizing a factor of

safety of two (2), the stormwater infiltration BMP shall be renovated and re-tested until such minimum required design permeability rates are achieved; and

e) The results of all field permeability tests shall be certified by a Professional Engineer and transmitted to the municipal engineer.

6. To help ensure maintenance of the design permeability rate over time, a six (6) inch layer of K5 soil shall be placed on the bottom of a stormwater infiltration BMP. This soil layer shall meet the textural and permeability specifications of a K5 soil as provided at N.J.A.C. 7:9A, Appendix A, Figure 6, and be certified to meet these specifications by a Professional Engineer licensed in the State of New Jersey. The depth to the seasonal high water table shall be measured from the bottom of the K5 sand layer.

7. The design engineer shall assess the hydraulic impact on the groundwater table and design the project site and all stormwater infiltration basins so as to avoid adverse hydraulic impacts. Adverse hydraulic impacts include, but are not limited to: raising the groundwater table so as to cause surface ponding; flooding of basements and other subsurface structures and areas; preventing a stormwater infiltration basin from completely draining via infiltration within seventy-two (72) hours of a design storm event; and interference with the proper operation of subsurface sewage disposal systems and other surface and subsurface structures in the vicinity of the stormwater infiltration basin.

8. The design engineer shall conduct a mounding analysis, as defined in Section VII, of all stormwater infiltration BMPs. The mounding analysis shall be conducted in accordance with the requirements in Section XI.C.3.l. Where the mounding analysis identifies adverse impacts, the stormwater infiltration BMP shall be redesigned or relocated, as appropriate.

9. Stormwater infiltration BMPs shall be constructed in accordance with the following:

   a) To avoid sedimentation that may result in clogging and reduce the basin's permeability rate, stormwater infiltration basins shall be constructed according to the following:

      i. Unless the conditions in (ii) below are met, a stormwater infiltration basin shall not be placed into operation until its drainage area is completely stabilized. Instead, upstream runoff shall be diverted around the basin and into separate, temporary stormwater management facilities and sediment basins. Such temporary facilities and basins shall be installed and utilized for stormwater management and sediment control until stabilization is achieved in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey, which is incorporated herein by reference as amended and supplemented.

      ii. If the design engineer determines that, for engineering, environmental or safety reasons, temporary stormwater management facilities and sediment basins cannot be constructed on the site, the stormwater infiltration basin may be placed into operation prior to the complete

stabilization of its drainage area provided that the basin's bottom during this period is constructed at a depth at least two (2) feet higher than its final design elevation. All other infiltration BMP construction requirements in this section shall be followed. When the drainage area is completely stabilized, all accumulated sediment shall be removed from the infiltration BMP, which shall then be excavated to its final design elevation in accordance with the construction requirements of this section and the performance standards in Section IV.

b) To avoid compaction of subgrade soils of BMP's that rely on infiltration, no heavy equipment such as backhoes, dump trucks or bulldozers shall be permitted to operate within the footprint of the BMP. All excavation required to construct a stormwater infiltration BMP shall be performed by equipment placed outside the BMP. If this is not possible, the soils within the excavated area shall be renovated and tilled after construction is completed to reverse the effects of compaction. In addition, post-development soil permeability testing shall be performed in accordance with B.5 of this section.

c) Earthwork associated with stormwater infiltration BMP construction, including excavation, grading, cutting or filling, shall not be performed when soil moisture content is above the lower plastic limit.

C. Safety Standards for Structural Stormwater Management Measures

1. 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.

2. A trash rack is a device intended to intercept runoff-borne trash and debris that might otherwise block the hydraulic openings in an outlet structure of a structural stormwater management measure. Trash racks shall be installed upstream of such outlet structure openings as necessary to ensure proper functioning of the structural stormwater management measure in accordance with the following:

d) The trash rack should be constructed primarily of bars aligned in the direction of flow with one (1) inch spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the bars shall be spaced no greater than one-third (1/3) the width of the hydraulic opening it is protecting or six inches, whichever is less. Transverse bars aligned perpendicular to flow should be sized and spaced as necessary for rack stability and strength.

e) The trash rack shall not adversely affect the hydraulic performance of either the outlet structure opening it is protecting or the overall outlet structure.

f) 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.

a) 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 pounds per square foot.

3. 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:

   a) The overflow grate shall be secured to the outlet structure but removable for emergencies and maintenance;

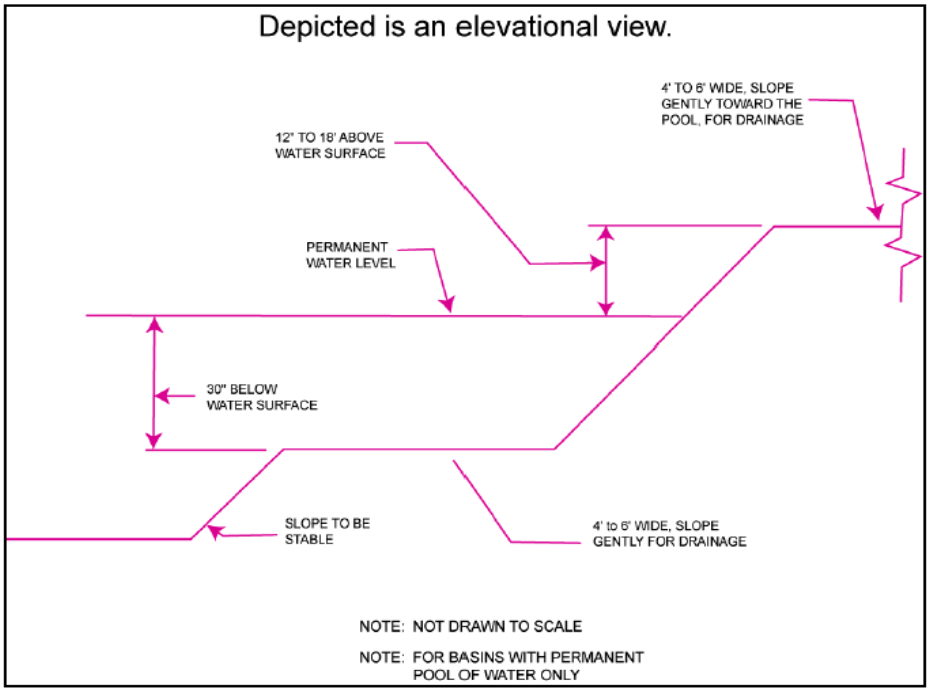
   b) The overflow grate spacing shall be no more than two (2) inches across the smallest dimension; and

   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 three hundred (300) pounds per square foot.

4. The maximum side slope for an earthen dam, embankment, or berm shall not be steeper than three (3) horizontal to one (1) vertical (3:1).

5. 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 (4) to six (6) feet in width. One step shall be located approximately two and one-half (2½) feet below the permanent water surface, and the second step shall be located one (1) to one and one-half (1½) feet above the permanent water surface. See a) below, for an illustration of safety ledges in a stormwater management basin.

   a) Illustration of safety ledges.



Source: N.J.A.C. 7:8-6 Appendix A.

Section VI. Inspection, Maintenance and Repair of Stormwater Management Measures.

A. Applicability. Projects subject to review pursuant to Section I.C of this ordinance shall comply with the requirements of Sections VI.B and VI.C below.

B. General Inspection, Maintenance and Repair Plan.

1. The design engineer shall prepare an Inspection, Maintenance and Repair Plan for the stormwater management measures, including both structural and nonstructural measures incorporated into the design of a major development. This plan shall be submitted as part of the Checklist Requirements established in Section II.C. Inspection and maintenance guidelines for stormwater management measures are available in the New Jersey BMP Manual.

2. The Inspection, Maintenance and Repair Plan shall contain the following:

   a) Accurate and comprehensive drawings of the site's stormwater management measures;

   b) Specific locations of each stormwater management measure identified by means of longitude and latitude as well as block and lot number;

   c) Specific preventative and corrective maintenance tasks and schedules for such tasks for each stormwater BMP;

   d) Cost estimates, including estimated cost of sediment, debris or trash removal; and

   e) The name, address and telephone number of the person or persons responsible for regular inspections and preventative and corrective maintenance (including repair and replacement). If the responsible person or persons is a corporation, company, partnership, firm, association, municipality or political subdivision of this State, the name and telephone number of an appropriate contact person shall also be included.

3. The person responsible for inspection, maintenance and repair identified under Section VI.B.2 above shall maintain a detailed log of all preventative and corrective maintenance performed for the site's stormwater management measures, including a record of all inspections and copies of all maintenance-related work orders in the Inspection, Maintenance and Repair Plan. Said records and inspection reports shall be retained for a minimum of five (5) years.

4. If the Inspection, Maintenance and Repair Plan identifies a person other than the developer (for example, a public agency or homeowners' association) as having the responsibility for inspection and 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 measure to such person under an applicable ordinance or regulation.

5. If the person responsible for inspection, maintenance and repair identified under Section VI.B.3 above is not a public agency, the maintenance plan and any future revisions based on Section VI.B.6 below shall be recorded upon the deed

of record for each property on which the maintenance described in the maintenance plan shall be undertaken.

6. The person responsible for inspection, maintenance and repair identified under Section VI.B.2 above shall evaluate the effectiveness of the Inspection, Maintenance and Repair Plan at least once per year and update the plan and the deed as needed.
7. The person responsible for inspection, maintenance and repair identified under Section VI.B.2 above shall submit the updated Inspection, Maintenance and Repair Plan and the documentation required by Sections VI.B.2 and VI.B.3 above to Toms River Township once per year.
8. The person responsible for inspection, maintenance and repair identified under Section VI.B.2 above shall retain and make available, upon request by any public entity with administrative, health, environmental or safety authority over the site the Inspection, Maintenance and Repair Plan and the documentation required by Sections VI.B.2 and VI.B.3 above.

C. Responsibility for inspection, repair and 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.

D. Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure, including, but not limited to: repairs or replacement to any associated appurtenance of the measure; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; repair or replacement of linings; and restoration of infiltration function.

E. Stormwater management measure easements shall be provided by the property owner as necessary for facility inspections and maintenance and preservation of stormwater runoff conveyance, infiltration, and detention areas and facilities. The purpose of the easement shall be specified in the maintenance agreement.

F. In the event that the stormwater management measure becomes a public health nuisance or danger to public safety or public health, or if it is in need of maintenance or repair, Toms River Township 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 the municipal engineer's designee. Toms River TownshiP, at 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 within the allowable time, Toms River Township may immediately proceed to do so with its own forces and equipment and/or through contractors. The costs and expenses of such maintenance and repair by Toms River Township shall be entered on the tax roll as a special charge against the property and collected with any other taxes levied thereon for the year in which the maintenance and repair was performed.

G. Requirements for Inspection, Maintenance and Repair of Stormwater BMP's that rely on infiltration. If a stormwater infiltration BMP is incorporated into the design of a major development, the applicant shall include the following requirements in its Inspection, Maintenance and Repair Plan:

1. Once per month (if needed): Mow side slopes, remove litter and debris, stabilize eroded banks, repair erosion at inflow structure(s);
2. After every storm exceeding one (1) inch of rainfall: Ensure that infiltration BMPs drain completely within seventy-two (72) hours after the storm event. If stored water fails to infiltrate seventy-two (72) hours after the end of the storm, corrective measures shall be taken. Raking or tilling by light equipment can assist in maintaining infiltration capacity and break up clogged surfaces;
3. Four times per year (quarterly): Inspect stormwater infiltration BMPs for clogging and excessive debris and sediment accumulation within the BMP, remove sediment (if needed) when completely dry;
4. Two times per year: Inspect for signs of damage to structures, repair eroded areas, check for signs of petroleum contamination and remediate;
5. Once per year: Inspect BMPs for unwanted tree growth and remove if necessary, disc or otherwise aerate bottom of infiltration basin to a minimum depth of six (6) inches; and
6. After every storm exceeding one (1) inch of rainfall, inspect and, if necessary**,** remove and replace K5 sand layer and accumulated sediment, to restore original infiltration rate.
7. Additional guidance for the inspection, maintenance and repair of stormwater infiltration BMPs can be found in the New Jersey BMP Manual.

H. Financing of Inspection, Maintenance and Repair of Stormwater BMPs. An adequate means of ensuring permanent financing of the inspection, maintenance and repair of stormwater BMPs shall be implemented and detailed in the Inspection, Maintenance and Repair Plan. Permanent financing of the inspection, maintenance and repair of stormwater BMPs shall be accomplished by:

The required payment of fees to a municipal stormwater fund in an amount equivalent to the cost of both ongoing maintenance activities and necessary structural replacements. The fee schedule is attached.

Section VII. Definitions.

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. When used in this ordinance, the following terms shall have the meanings herein ascribed to them.

“Toms River Township” means the Planning Board, Zoning Board of Adjustment or other board, agency or official of Toms River Township with authority to approve or disapprove subdivisions, site plans, construction permits, building permits or other applications for development approval. For the purposes of reviewing development applications and ensuring compliance with the requirements of this ordinance, Toms River Township may designate the municipal engineer or other qualified designee to act on behalf of Toms River Township.

“Aquaculture” means the propagation, rearing and subsequent harvesting of aquatic organisms in controlled or selected environments, and their subsequent processing, packaging and marketing, including but not limited to, activities to intervene in the rearing process to increase production such as stocking, feeding, transplanting and providing for protection from predators.

“Certification” means either a written statement signed and sealed by a licensed New Jersey Professional Engineer attesting that a BMP design or stormwater management system conforms to or meets a particular set of standards or to action taken by the Commission pursuant to N.J.A.C. 7:50-3, Part II or Part IV. Depending upon the context in which the term is use, the terms "certify" and "certified" shall be construed accordingly.

“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.

"Construction" means the construction, erection, reconstruction, alteration, conversion, demolition, removal or equipping of buildings, structures or components of a stormwater management system including but not limited to collection inlets, stormwater piping, swales and all other conveyance systems, and stormwater BMPs.

“County review agency” means an agency designated by the County Board of Chosen Freeholders to review municipal stormwater management plans and implementing ordinance(s). The county review agency may either be:

A county planning agency; or

A county water resource association created under N.J.S.A. 58:16A-55.5, if the ordinance or resolution delegates authority to approve, conditionally approve, or disapprove municipal stormwater management plans and implementing ordinances.

“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 project requirements, creation and development of project design and preparation of drawings and specifications.

“Design permeability” means the tested permeability rate with a factor of safety of two (2) applied to it (e.g., if the tested permeability rate of the soils is four (4) inches per hour, the design rate would be two (2) inches per hour).

“Development” means the change of or enlargement of any use or disturbance of any land, the performance of any building or mining operation, the division of land into two or more parcels, and the creation or termination of rights of access or riparian rights including, but not limited to:

1. A change in type of use of a structure or land;
2. A reconstruction, alteration of the size, or material change in the external appearance of a structure or land;
3. A material increase in the intensity of use of land, such as an increase in the number of businesses, manufacturing establishments, offices or dwelling units in a structure or on land;
4. Commencement of resource extraction or drilling or excavation on a parcel of land;
5. Demolition of a structure or removal of trees;
6. Commencement of forestry activities;
7. Deposit of refuse, solid or liquid waste or fill on a parcel of land;
8. In connection with the use of land, the making of any material change in noise levels, thermal conditions, or emissions of waste material; and
9. Alteration, either physically or chemically, of a shore, bank, or flood plain, seacoast, river, stream, lake, pond, wetlands or artificial body of water.

In the case of development on agricultural land, i.e. lands used for an agricultural use or purpose as defined at N.J.A.C. 7:50-2.11, development means: any activity that requires a State permit; any activity reviewed by the County Agricultural Boards (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.

“Development, major” means any division of land into five or more lots; any construction or expansion of any housing development of five or more dwelling units; any construction or expansion of any commercial or industrial use or structure on a site of more than three acres; or any “development,” grading, clearing or disturbance of an area in excess of five thousand square feet (5,000 ft^2). Disturbance for the purpose of this ordinance is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting or removing of vegetation.

“Development, minor” means all development other than major development.

“Drainage area” means a geographic area within which stormwater, sediments, or dissolved materials drain to a BMP, a stormwater management system, a particular receiving waterbody or 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 animal species; threatened or endangered plants of the Pinelands pursuant to N.J.A.C. 7:5-6.27(a); large areas of contiguous open space or upland forest; steep slopes; and well head protection and groundwater recharge areas. T & E habitat constitutes habitat that is critical for the survival of a local population of threatened and endangered species or habitat that is identified using the Department’s Landscape Project as approved by the Department’s Endangered and Nongame Species Program, whichever is more inclusive. Threatened and endangered wildlife shall be protected in conformance with N.J.A.C. 7:50-6.33.

“Exception” means the approval by the approving authority of a variance or other material departure from strict compliance with any section, part, phrase or provision of this ordinance. An exception may be granted only under certain specific, narrowly-defined conditions described herein and does not constitute a waiver of strict compliance with any section, part, phrase or provision of the Pinelands Comprehensive Management Plan (N.J.A.C. 7:50-1.1 et seq.).

“Extended detention basin” means a facility constructed through filling and/or excavation that provides temporary storage of stormwater runoff. It has an outlet structure that detains and attenuates runoff inflows and promotes the settlement of pollutants. An extended detention basin is normally designed as a multi-stage facility that provides runoff storage and attenuation for both stormwater quality and quantity management. The term “stormwater detention basin” shall have the same meaning as “extended detention basin.”

"Finished grade" means the elevation of the surface of the ground after completion of final grading, either via cutting, filling or a combination thereof.

"Grading" means modification of a land slope by cutting and filling with the native soil or re-distribution of the native soil which is present at the site.

"Groundwater" means water below the land surface in a zone of saturation.

“Groundwater mounding analysis” means a test performed to demonstrate that the groundwater below a stormwater infiltration basin will not “mound up,” encroach on the unsaturated zone, break the surface of the ground at the infiltration area or downslope, and create an overland flow situation.

“Heavy Equipment” means equipment, machinery, or vehicles that exert ground pressure in excess of eight (8) pounds per square inch.

“High Pollutant Loading Area” means an area in an industrial or commercial development site: where solvents and/or petroleum products are loaded/unloaded, stored, or applied; where pesticides are loaded/unloaded or stored; 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; where recharge would be inconsistent with NJDEP-approved remedial action work plan or landfill closure plan; and/or where a high risk exists for spills of toxic materials, such as gas stations and vehicle maintenance facilities. The term “HPLA” shall have the same meaning as “High Pollutant Loading Area.”

“Impervious surface” means a surface that has been covered with a layer of material so that it is highly resistant to infiltration by water.

“Infiltration” is the process by which precipitation enters the soil through its surface.

"In lieu contribution" means a monetary fee collected by Toms River Township in lieu of requiring strict on-site compliance with the groundwater recharge, stormwater runoff quantity and/or stormwater runoff quality standards established in this ordinance.

"Install" means to assemble, construct, put in place or connect components of a stormwater management system.

“Mitigation” means acts necessary to prevent, limit, remedy or compensate for conditions that may result from those cases where an applicant has demonstrated the inability or impracticality of strict compliance with the stormwater management requirements set forth in N.J.A.C. 7:8, in an adopted regional stormwater management plan, or in a local ordinance which is as protective as N.J.A.C. 7:8, and an exception from strict compliance is granted by Toms River Township and the Pinelands Commission.

“New Jersey Stormwater Best Management Practices Manual” means guidance developed by the New Jersey Department of Environmental Protection, in coordination with the New Jersey Department of Agriculture, the New Jersey Department of Community Affairs, the New Jersey Department of Transportation, municipal engineers, county engineers, consulting firms, contractors, and environmental organizations to address the standards in the New Jersey Stormwater Management Rules, N.J.A.C. 7:8. The BMP manual provides examples of ways to meet the standards contained in the rule. An applicant may demonstrate that other proposed management practices will also achieve the standards established in the rules. The manual, and notices regarding future versions of the manual, are available from the Division of Watershed

Management, NJDEP, PO Box 418, Trenton, New Jersey 08625; and on the NJDEP's website, www.njstormwater.org. The term "New Jersey BMP Manual" shall have the same meaning as "New Jersey Stormwater Best Management Practices Manual."

"NJDEP" means the New Jersey Department of Environmental Protection.

"NJPDES" means the New Jersey Pollutant Discharge Elimination System as set forth in N.J.S.A. 58:10A-1 et seq. and in N.J.A.C. 7:14A.

"NJPDES permit" means a permit issued by the NJDEP pursuant to the authority of the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., and N.J.A.C. 7:14A for a discharge of pollutants.

"Nonpoint source" means:

1. Any human-made or human-induced activity, factor, or condition, other than a point source, from which pollutants are or may be discharged;
2. Any human-made or human-induced activity, factor, or condition, other than a point source, that may temporarily or permanently change any chemical, physical, biological, or radiological characteristic of waters of the State from what was or is the natural, pristine condition of such waters, or that may increase the degree of such change; or
3. Any activity, factor, or condition, other than a point source, that contributes or may contribute to water pollution.

The term "NPS" shall have the same meaning as "nonpoint source."

"Nonstructural BMP" means a stormwater management measure, strategy or combination of strategies that reduces adverse stormwater runoff impacts through sound site planning and design. Nonstructural BMPs include such practices as minimizing site disturbance, preserving important site features, reducing and disconnecting impervious cover, flattening slopes, utilizing native vegetation, minimizing turf grass lawns, maintaining natural drainage features and characteristics and controlling stormwater runoff and pollutants closer to the source. The term "Low Impact Development technique" shall have the same meaning as "nonstructural BMP."

"Nutrient" means a chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the development of organisms.

"Permeability" means the rate at which water moves through a saturated unit area of soil or rock material at hydraulic gradient of one, determined as prescribed in N.J.A.C. 7:9A-6.2 (Tube Permeameter Test), N.J.A.C. 6.5 (Pit Bailing Test) or N.J.A.C. 6.6 (Piezometer Test). Alternative permeability test procedures may be accepted by the

approving authority provided the test procedure attains saturation of surrounding soils, accounts for hydraulic head effects on infiltration rates, provides a permeability rate with units expressed in inches per hour and is accompanied by a published source reference. Examples of suitable sources include hydrogeology, geotechnical, or engineering text and design manuals, proceedings of American Society for Testing and Materials (ASTM) symposia, or peer-review journals. Neither a Soil Permeability Class Rating Test, as described in N.J.A.C. 7:9A-6.3, nor a Percolation Test, as described in N.J.A.C. 7:9A-6.4, are acceptable tests for establishing permeability values for the purpose of complying with this ordinance.

"Permeable" means having a permeability of one (1) inch per hour or faster. The terms "permeable soil," "permeable rock" and "permeable fill" shall be construed accordingly.

“Person” means any individual, corporation, company, partnership, firm, association, municipality 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.

“Pinelands Commission” or “Commission” means the Commission created pursuant Section 5 of the Pinelands Protection Act, N.J.S.A. 13:18A-5.

"Pinelands CMP" means the New Jersey Pinelands Comprehensive Management Plan (N.J.A.C. 7:50 1.1 et seq).

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

“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 substances (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, suspended solids, cellar dirt, industrial, municipal, agricultural, and construction waste or runoff, or other residue discharged directly or indirectly to the land, groundwaters or surface waters of the State, or to a domestic treatment works. “Pollutant” includes both hazardous and nonhazardous pollutants.

"Professional Engineer" means a person licensed to practice Professional Engineering in the State of New Jersey pursuant to N.J.S.A. 48:8-27 et seq.

“Recharge” means the amount of water from precipitation that infiltrates into the ground and is not evapotranspired.

"Replicate" means one of two or more soil samples or tests taken at the same location (within five feet of each other) and depth, within the same soil horizon or substratum. In the case of fill material, replicate tests are tests performed on sub-samples of the same bulk sample packed to the same bulk density.

"Sand" means a particle size category consisting of mineral particles which are between 0.05 and 2.0 millimeters in equivalent spherical diameter. Also, a soil textural class having 85 percent or more of sand and a content of silt and clay such that the percentage of silt plus 1.5 times the percentage of clay does not exceed 15, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Seasonally high water table" means the upper limit of the shallowest zone of saturation which occurs in the soil, identified as prescribed in N.J.A.C. 7:9A-5.8.

“Sediment” means solid material, mineral or organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water or gravity as a product of erosion.

“Site” means the lot or lots upon which a major development is to occur or has occurred.

“Soil” means all unconsolidated mineral and organic material of any origin which is not a rock substratum, including sediments below the biologically active and/or weathered zones.

“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, which could be a source of pollutants in any industrial stormwater discharge to groundwater. 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.

“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.

“Stormwater infiltration BMP” means a basin or other facility constructed within permeable soils that provides temporary storage of stormwater runoff. An infiltration BMP does not normally have a structural outlet to discharge runoff from the stormwater quality design storm. Instead, outflow from an infiltration BMP is through the surrounding soil. The terms “infiltration measure” and “infiltration practice” shall have the same meaning as “stormwater infiltration basin.”

“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 groundwater recharge of stormwater or to eliminate illicit or illegal non-stormwater discharges into stormwater conveyances. This includes, but is not limited to, structural and nonstructural stormwater Best Management Practices described in the New Jersey BMP Manual and designed to meet the standards for stormwater control contained within this ordinance. The terms “stormwater Best Management Practice” and “stormwater BMP” shall have the same meaning as “stormwater management measure.”

“Stormwater runoff” means water flow on the surface of the ground or in storm sewers, resulting from precipitation.

"Suitable soil" means unsaturated soil, above the seasonally high water table, which contains less than fifty percent (50%) by volume of coarse fragments and which has a tested permeability rate of between one (1) and twenty (20) inches per hour.

"Surface water" means any waters of the State which are not groundwater.

“Time of concentration” means the time it takes for runoff to travel from the hydraulically most distant point of the drainage area to the point of interest within a watershed.

“Total Suspended Solids” means the insoluble solid matter suspended in water and stormwater that is separable by laboratory filtration in accordance with the procedure contained in the "Standard Methods for the Examination of Water and Wastewater" prepared and published jointly by the American Public Health Association, American Water Works Association and the Water Pollution Control Federation. The term “TSS” shall have the same meaning as “Total Suspended Solids.”

“Tidal Flood Hazard Area” means a flood hazard area, which may be influenced by stormwater runoff from inland areas, but which is primarily caused by the Atlantic Ocean.

"Waters of the State" means the ocean and its estuaries, all springs, streams and bodies of surface and groundwater, whether natural or artificial, within the boundaries of New Jersey or subject to its jurisdiction.

"Water table" means the upper surface of a zone of saturation.

"Well" means a bored, drilled or driven shaft, or a dug hole, which extends below the seasonally high water table and which has a depth which is greater than its largest surface dimension.

“Wetlands” mean those lands which are inundated or saturated by water at a magnitude, duration and frequency sufficient to support the growth of hydrophytes. Wetlands include lands with poorly drained or very poorly drained soils as designated by the National Cooperative Soils Survey of the Soil Conservation Service of the United States Department of Agriculture. Wetlands include coastal wetlands and inland wetlands, including submerged lands. The "New Jersey Pinelands Commission Manual for Identifying and Delineating Pinelands Area Wetlands: A Pinelands Supplement to the Federal Manual for Identifying and Delineating Jurisdictional Wetlands," dated January, 1991, as amended, may be utilized in delineating the extent of wetlands based on the definitions of wetlands and wetlands soils contained in this section, N.J.A.C. 7:50 2.11, 6.4 and 6.5. The term “wetland” shall have the same meaning as “wetlands.”

“Wet pond” means a stormwater facility constructed through filling and/or excavation that provides both permanent and temporary storage of stormwater runoff. It has an outlet structure that creates a permanent pool and detains and attenuates runoff inflows and promotes the settling of pollutants. A stormwater retention basin can also be designed as a multi-stage facility that also provides extended detention for enhanced stormwater quality design storm treatment and runoff storage and attenuation for stormwater quantity management. The term “stormwater retention basin” shall have the same meaning as “wet pond.”

Section VIII. 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. 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 a fine of $1000.00 per violation.

Section IX. EFFECTIVE DATE.

This ordinance shall take effect immediately upon the following:

B. Certification by the Pinelands Commission in accordance with N.J.A.C. 7:50 Subchapter 3; and

C. Approval by the county review agency in accordance with NJAC 7:8

Section X. 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.

Section XI. Appendices.

A. Methods for Calculating Groundwater Recharge.

1. The New Jersey Geological Survey Report GSR-32: A Method for Evaluating Ground-Water Recharge Areas in New Jersey. Available at http://www.njgeology.org/geodata/dgs99-2.htm.

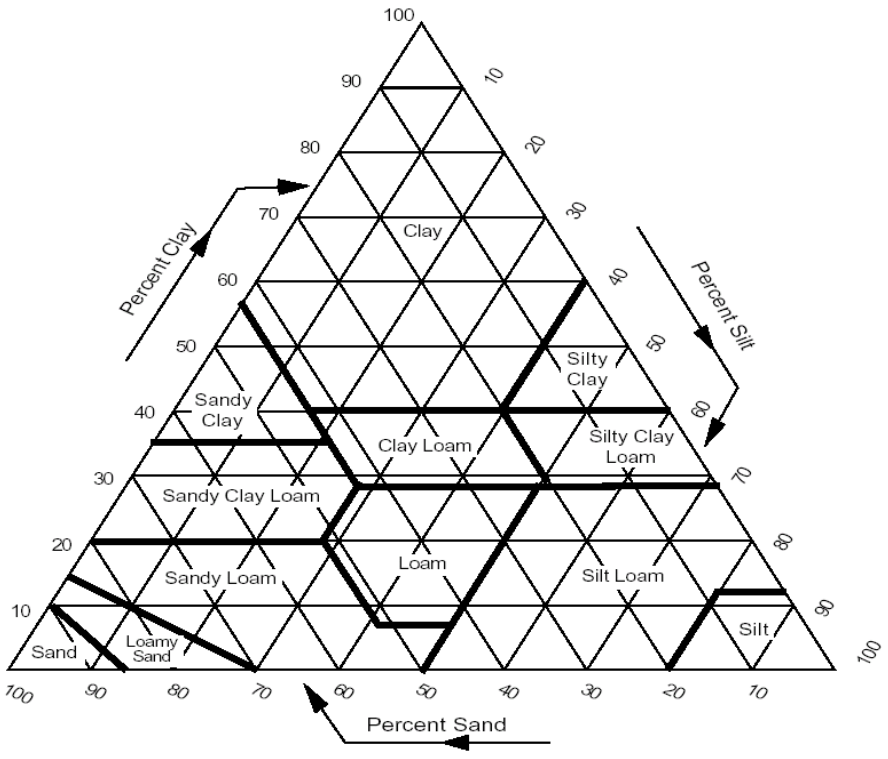
2. The New Jersey Groundwater Recharge Spreadsheet (NJGRS). Available in the New Jersey BMP Manual, Chapter 6, at http://www.njstormwater.org/bmp_manual2.htm.

B. NJDEP Nonstructural Strategies Point System .

The New Jersey Stormwater Management Rules at N.J.A.C. 7:8-5.2(a), and Section IV. A. of this Ordinance, require nonstructural stormwater management strategies to be incorporated into the site design of a major development. A total of nine strategies are to be used to the maximum extent practical to meet the groundwater recharge, stormwater quality and stormwater quantity requirements of the Rules prior to utilizing structural stormwater management measures. The New Jersey Nonstructural Stormwater Management Strategies Point System (NSPS) provides a tool to assist planners, designers and regulators in determining that the strategies have been used to the "maximum extent practical" at a major development as required by the Rules. Refer online to http://www.njstormwater.org for information on the NSPS.

C. Soils.

1. USDA Soil Textural Triangle.



Source: US Department of Agriculture.

2. **Definitions.** For the purposes of this appendix, the following terms shall have the meanings herein ascribed to them.

"A-horizon" means the uppermost mineral horizon in a normal soil profile. The upper part of the A-horizon is characterized by maximum accumulation of finely divided, dark colored organic residues, known as humus, which are intimately mixed with the mineral particles of the soil.

"Artesian zone of saturation" means a zone of saturation which exists immediately below a hydraulically restrictive horizon, and which has an upper surface that is at a pressure greater than atmospheric, either seasonally or throughout the year.

"Chroma" means the relative purity or strength of a color, a quantity which decreases with increasing grayness. Chroma is one of the three variables of soil color as defined in the Munsell system of classification.

"Clay" means a particle size category consisting of mineral particles which are smaller than 0.002 millimeters in equivalent spherical diameter. Also, a soil textural class having more than 40 percent clay, less than 45 percent sand, and less than 40 percent silt, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Clay loam" means a soil textural class having 27 to 40 percent clay and 20 to 45 percent sand, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Coarse fragment" means a rock fragment contained within the soil which is greater than two millimeters in equivalent spherical diameter or which is retained on a two millimeter sieve.

"County soil survey report" means a report prepared by the US Department of Agriculture, Natural Resources Conservation Service which includes maps showing the distribution of soil mapping units throughout a particular county together with narrative descriptions of the soil series shown and other information relating to the uses and properties of the various soil series.

“Direct supervision” means control over and direction of work carried out by others with full knowledge of and responsibility for such work.

"Equivalent spherical diameter" of a particle means the diameter of a sphere which has a volume equal to the volume of the particle.

"Excessively coarse horizon" means a horizon of limited thickness within the soil profile which provides inadequate removal of pollutants from stormwater due to a high coarse fragment content, excessively coarse texture and/or excessively rapid permeability.

"Excessively coarse substratum" means a substratum below the soil profile which extends beyond the depth of soil profile pits and borings and which provides inadequate removal of pollutants from stormwater due to a high coarse fragment content, excessively coarse texture and/or excessively rapid permeability.

"Extremely firm consistence" means a type of soil material whose moist aggregated mass crushes only under very strong pressure; cannot be crushed between the thumb and forefinger and shall be broken apart bit by bit.

"Firm consistence" means a type of soil material whose moist aggregated mass crushes under moderate pressure between the thumb and forefinger but resistance is distinctly noticeable.

"Hard consistence" means a type of soil material whose dry aggregated mass is moderately resistant to pressure; can be broken in the hands without difficulty but is barely breakable between the thumb and forefinger.

"Hue" means the dominant spectral color, one of the three variables of soil color defined within the Munsell system of classification.

"Hydraulically restrictive horizon" means a horizon within the soil profile which slows or prevents the downward or lateral movement of water and which is underlain by permeable soil horizons or substrata. Any soil horizon which has a saturated permeability less than one (1.0) inch per hour is hydraulically restrictive.

"Hydraulically restrictive substratum" means a substratum below the soil profile which slows or prevents the downward or lateral movement of water and which extends beyond the depth of profile pits or borings or to a massive substratum. A substratum which has a saturated permeability less than one (1.0) inch per hour is hydraulically restrictive.

"Loamy sand" means a soil textural class, as shown in Section XI.C.1 (USDA Soil Textural Triangle), that has a maximum of 85 to 90 percent (85-90%) sand with a percentage of silt plus one and a half (1.5) times the percentage of clay not in excess of fifteen (15); or a minimum of 70 to 85 percent (70-85%) sand with a percentage of silt plus one and a half (1.5) times the percentage of clay not in excess of thirty (30).

"Lower plastic limit" means the moisture content corresponding to the transition between the plastic and semi-solid states of soil consistency. This corresponds to the lowest soil moisture content at which the soil can be molded in the fingers to form a rod or wire, one-eighth (1/8) inches in thickness, without crumbling.

"Mottling" means a color pattern observed in soil consisting of blotches or spots of contrasting color. The term "mottle" refers to an individual blotch or spot. The terms “color variegation,” “iron depletion” and “iron concentration” are equivalent to the term “mottling.” Mottling due to redoximorphic reactions is an indication of seasonal or periodic and recurrent saturation.

"Munsell system" means a system of classifying soil color consisting of an alpha-numeric designation for hue, value and chroma, such as "7.5 YR 6/2," together with a descriptive color name, such as "strong brown."

"O-horizon" means a surface horizon, occurring above the A-horizon in some soils, which is composed primarily of undecomposed or partially decomposed plant remains which have not been incorporated into the mineral soil.

"Perched zone of saturation" means a zone of saturation which occurs immediately above a hydraulically restrictive horizon and which is underlain by permeable horizons or substrata which are not permanently or seasonally saturated.

"Piezometer" means a device consisting of a length of metal or plastic pipe, open at the bottom or perforated within a specified interval, and used for the determination of depth to water, permeability or hydraulic head within a specific soil horizon or substratum.

"Platy structure" is characterized by a soil aggregate which has one axis distinctly shorter than the other two and are oriented with the short axis vertical.

"Regional zone of saturation" means a zone of saturation which extends vertically without interruption below the depth of soil borings and profile pits.

"Sandy clay" means a soil textural class having 35 percent (35%) or more of clay and 45 percent (45%) or more of sand, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Sandy loam" means a soil textural class, as shown in Section XI.C.1 (USDA Soil Textural Triangle), that has a maximum of 20 percent clay, and the percentage of

silt plus twice the percentage of clay exceeds 30, and contains 52 percent or more sand; or less than 7 percent clay, less than 50 percent silt, and between 43 and 52 percent sand.

"Silt" means a particle size category consisting of mineral particles which are between 0.002 and 0.05 millimeters in equivalent spherical diameter. It also means a soil textural class having 80 percent or more of silt and 12 percent or less of clay, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Silt loam" means a soil textural class having 50 percent or more of silt and 12 to 27 percent of clay; or 50 to 80 percent of silt and less than 12 percent of clay, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Silty clay" means a soil textural class having 40 percent or more of clay and 40 percent or more of silt, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Silty clay loam" means a soil textural class having 27 to 40 percent of clay and less than 20 percent of sand, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Soil aggregate" means a naturally occurring unit of soil structure consisting of particles of sand, silt, clay, organic matter, and coarse fragments held together by the natural cohesion of the soil.

"Soil color" means the soil color name and Munsell color designation determined by comparison of the moist soil with color chips contained in a Munsell soil color book.

"Soil consistence" means the resistance of a soil aggregate or clod to being crushed between the fingers or broken by the hands. Terms for describing soil consistence described are in N.J.A.C. 7:9A-5.3(h).

"Soil horizon" means a layer within a soil profile differing from layers of soil above and below it in one or more of the soil morphological characteristics including color, texture, coarse fragment content, structure, consistence and mottling.

"Soil log" means a description of the soil profile which includes the depth, thickness, color, texture, coarse fragment content, mottling, structure and consistence of each soil horizon or substratum.

"Soil mapping unit" means an area outlined on a map in a County Soil Survey Report and marked with a letter symbol designating a soil phase, a complex of

two or more soil phases, or some other descriptive term where no soil type has been identified.

"Soil phase" means a specific type of soil which is mapped by the Natural Resources Conservation Service and which belongs to a soil series described within the County Soil Survey Report.

"Soil profile" means a vertical cross-section of undisturbed soil showing the characteristic horizontal layers or horizons of the soil which have formed as a result of the combined effects of parent material, topography, climate, biological activity and time.

"Soil series" means a grouping of soil types possessing a specific range of soil profile characteristics which are described within the County Soil Survey Report. Each soil series may consist of several "soil phases" which may differ in slope, texture of the surface horizon or stoniness.

"Soil structural class" means one of the shape classes of soil structure described in N.J.A.C. 7:9A-5.3(g).

"Soil structure" means the naturally occurring arrangement, within a soil horizon, of sand, silt and clay particles, coarse fragments and organic matter, which are held together in clusters or aggregates of similar shape and size.

"Soil test pit" means an excavation made for the purpose of exposing a soil profile which is to be described.

"Soil textural class" means one of the classes of soil texture defined within the USDA system of classification. (Soil Survey Manual, Agricultural Handbook No. 18, USDA Soil Conservation Service 1962.)

"Soil texture" means the relative proportions of sand, silt and clay in that portion of the soil which passes through a sieve with two millimeter openings.

"Static water level" means the depth below the ground surface or the elevation with respect to some reference level, of the water level observed within a soil profile pit or boring, or within a piezometer, after this level has stabilized or become relatively constant with the passage of time.

"Substratum" means a layer of soil or rock material present below the soil profile and extending beyond the depth of soil borings or profile pits.

"Unsuitable soil" means all soil other than suitable soil.

"USDA system of classification" means the system of classifying soil texture used by the United States Department of Agriculture which defines 12 soil textural classes based upon the weight percentages of sand, silt and clay in that portion of the soil which passes through a sieve with two millimeter (2 mm) openings. The soil textural classes are shown graphically on the USDA Soil Textural Triangle, as shown in Section XI.C.1.

"Value" means the relative lightness or intensity of a color, one of the three variables of soil color defined within the Munsell system of classification.

"Very firm consistence" is characterized by a moist soil which crushes under strong pressure; barely crushable between thumb and forefinger.

"Very hard consistence" is characterized by a dry soil which is resistant to pressure, can be broken in the hands only with difficulty; not breakable between the thumb and forefinger.

"Zone of saturation" means a layer within or below the soil profile which is saturated with ground water either seasonally or throughout the year. This includes both regional and perched zones.

3. Methods for Assessing Soil Suitability for Infiltration Stormwater Management BMPs. The results of a subsurface investigation shall serve as the basis for the site selection and design of stormwater infiltration BMPs. The subsurface investigation shall include, but not be limited to, a series of soil test pits and soil permeability tests conducted in accordance with the following:

   a) All soil test pits and soil permeability results shall be performed under the direct supervision of a Professional Engineer. All soil logs and permeability test data shall be accompanied by a certification by a Professional Engineer. The results and location (horizontal and vertical) of all soil test pits and soil permeability tests, both passing and failing, shall be reported to Toms River TownshiP.

   b) During all subsurface investigations and soil test procedures, adequate safety measures shall be taken to prohibit unauthorized access to the excavations at all times. It is the responsibility of persons performing or witnessing subsurface investigations and soil permeability tests to comply with all applicable Federal, State and local laws and regulations governing occupational safety.

   c) A minimum of two (2) soil test pits shall be excavated within the footprint of any proposed infiltration BMP to determine the suitability and distribution of

soil types present at the site. Placement of the test pits shall be within twenty (20) feet of the basin perimeter, located along the longest axis bisecting the BMP. For BMPs larger than ten thousand (10,000) square feet in area, a minimum of one (1) additional soil test pit shall be conducted within each additional area of ten thousand (10,000) square feet. The additional test pit(s) shall be placed approximately equidistant to other test pits, so as to provide adequate characterization of the subsurface material. In all cases, where soil and or groundwater properties vary significantly, additional test pits shall be excavated in order to accurately characterize the subsurface conditions below the proposed infiltration BMP. Soil test pits shall extend to a minimum depth of eight (8) feet below the lowest elevation of the basin bottom or to a depth that is at least two (2) times the maximum potential water depth in the proposed infiltration BMP, whichever is greater.

d) A soil test pit log shall be prepared for each soil test pit. The test pit log shall, at a minimum, provide the elevation of the existing ground surface, the depth and thickness (in inches) of each soil horizon or substratum, the dominant matrix or background and mottle colors using the Munsell system of classification for hue, value and chroma, the appropriate textural class as shown on the USDA textural triangle, the volume percentage of coarse fragments (larger than two (2) millimeters in diameter), the abundance, size, and contrast of mottles, the soil structure, soil consistence, and soil moisture condition, using standard USDA classification terminology for each of these soil properties. Soil test pit logs shall identify the presence of any soil horizon, substratum or other feature that exhibits an in-place permeability rate less than one (1) inch per hour.

e) Each soil test pit log shall report the depth to seasonally high water level, either perched or regional, and the static water level based upon the presence of soil mottles or other redoximorphic features, and observed seepage or saturation. Where redoxomorphic features including soil mottles resulting from soil saturation are present, they shall be interpreted to represent the depth to the seasonal high water table unless soil saturation or seepage is observed at a higher level. When the determination of the seasonally high water table shall be made in ground previously disturbed by excavation, direct observation of the static water table during the months of January through April shall be the only method permitted.

f) Any soil horizon or substratum which exists immediately below a perched zone of saturation shall be deemed by rule to exhibit unacceptable permeability (less than one (1) inch per hour). The perched zone of saturation may be observed directly, inferred based upon soil morphology, or confirmed by performance of a hydraulic head test as defined at N.J.A.C. 7:9A-5.9.

g) Stormwater infiltration BMPs shall not be installed in soils that exhibit artesian groundwater conditions. A permeability test shall be conducted in all soils that immediately underlie a perched zone of saturation. Any zone of saturation which is present below a soil horizon which exhibits an in-place permeability of less than 0.2 inches per hour shall be considered an artesian zone of

saturation unless a minimum one foot thick zone of unsaturated soil, free of mottling or other redoximorphic features and possessing a chroma of four or higher, exists immediately below the unsuitable soil.

h) A minimum of one (1) permeability test shall be performed at each soil test pit location. The soil permeability rate shall be determined using test methodology as prescribed in N.J.A.C. 7:9A-6.2 (Tube Permeameter Test), 6.5 (Pit Bailing Test) or 6.6 (Piezometer Test). When the tube permeameter test is used, a minimum of two replicate samples shall be taken and tested. Alternative permeability test procedures may be accepted by the approving authority provided the test procedure attains saturation of surrounding soils, accounts for hydraulic head effects on infiltration rates, provides a permeability rate with units expressed in inches per hour and is accompanied by a published source reference. Examples of suitable sources include hydrogeology, geotechnical or engineering text and design manuals, proceedings of American Society for Testing and Materials (ASTM) symposia, or peer-review journals. Neither a Soil Permeability Class Rating Test, as described in N.J.A.C. 7:9A-6.3, nor a Percolation Test, as described in N.J.A.C. 7:9A-6.4, are acceptable tests for establishing permeability values for the purpose of complying with this ordinance.

i) Soil permeability tests shall be conducted on the most hydraulically restrictive horizon or substratum to be left in place below the basin as follows. Where no soil replacement is proposed, the permeability tests shall be conducted on the most hydraulically restrictive horizon or substratum within four (4) feet of the lowest elevation of the basin bottom or to a depth equal to two (2) times the maximum potential water depth within the basin, whichever is greater. Where soil replacement is proposed, the permeability tests shall be conducted within the soil immediately below the depth of proposed soil replacement or within the most hydraulically restrictive horizon or substratum to a depth equal to two (2) times the maximum potential water depth within the basin, whichever is greater. Permeability tests may be performed on the most hydraulically restrictive soil horizons or substrata at depths greater than those identified above based upon the discretion of the design or testing engineer. The tested infiltration rate should then be divided by two (2) to establish the soil's design permeability rate. Such division will provide a 100% safety factor to the tested rate.

j) The minimum acceptable "tested permeability rate" of any soil horizon or substratum shall be one (1) inch per hour. Soil materials that exhibit tested permeability rates slower than one (1) inch per hour shall be considered unsuitable for stormwater infiltration. The maximum reportable "tested permeability rate" of any soil horizon or substratum shall be no greater than twenty (20) inches per hour regardless of the rate attained in the test procedure.

k) After all construction activities have been completed on the development site and the finished grade has been established in the infiltration BMP, a minimum of one permeability test shall be conducted within the most

hydraulically restrictive soil horizon or substratum below the as-built BMP to ensure the performance of the infiltration BMP is as designed. Hand tools and manual permeability test procedures shall be used for the purpose of confirming BMP performance. In addition, the infiltration BMP shall be flooded with water sufficient to demonstrate the performance of the BMP. Test results shall be certified to the municipal engineer.

l) A groundwater mounding analysis shall be provided for each stormwater infiltration BMP. The groundwater mounding analysis shall calculate the maximum height of the groundwater mound based upon the volume of the maximum design storm. The Professional Engineer conducting the analysis shall provide the municipal engineer with the methodology and supporting documentation for the mounding analysis used and shall certify to Toms River TownshiP, based upon the analysis, that the groundwater mound will not cause stormwater or groundwater to breakout to the land surface or cause adverse impact to adjacent surface water bodies, wetlands or subsurface structures including but not limited to basements and septic systems. If there is more than one infiltration BMP proposed, the model shall indicate if and how the mounds will interact. The mounding analysis shall be calculated using the most restrictive soil horizon that will remain in place within the explored aquifer thickness unless alternative analyses is authorized by the municipal engineer. The mounding analysis shall be accompanied by a cross section of the infiltration BMP and surrounding topography and the mound analysis shall extend out to the point(s) at which the mound intersects with the preexisting maximum water table elevation.

m) The applicant shall demonstrate that stormwater infiltration BMPs meet the seventy-two (72) hour drain time requirement established in Section V.B.1 of this ordinance.

D. Pretreatment measures for infiltration BMPs. By reducing incoming velocities and capturing coarser sediments, pretreatment can extend the functional life and increase the pollutant removal capability of infiltration measures. Therefore, the installation of pretreatment measures is recommended for all development sites. Pretreatment measures may include, but are not limited to, the following:

1. Vegetative filter strips;
2. Bioretention systems. Used in conjunction with a bioretention system, the infiltration basin takes the place of the standard underdrain;
3. Sand filters;
4. Grassed swales; and
5. Detention basins.

E. Collection and Conveyance.

1. Bicycle-safe inlet grates. Site development plans that incorporate site design features that help to prevent discharge of trash and debris from drainage systems shall comply with the following standard to control passage of solid and

floatable materials through storm drain inlets. For purposes of this paragraph, “solid and floatable materials” means sediment, debris, trash, and other floating, suspended, or settleable solids.

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:

   i. 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

   ii. A different grate, if each individual clear space in that grate has an area of no more than seven (7) square inches, or is no greater than one half (0.5) inch 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) square inches, or be no greater than two (2) inches across the smallest dimension.

c) This standard does not apply:

   i. 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;

   ii. Where flows from the water quality design storm as specified in Section III 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:

      (a) A rectangular space four and five-eighths (4 and 5/8) inches long and one and one-half (1.5) inches wide (this option does not apply for outfall netting facilities); or

      (b) A bar screen having a bar spacing of one-half (0.5) inch.

   iii. Where flows are conveyed through a trash rack that has parallel bars with one (1) inch spacing between the bars, to the elevation of the water quality design storm as specified in Section III of this ordinance; or

   iv. Where the NJDEP 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.

2. Catch basins. Catch basins are storm drain inlets with or without sumps. Catch basins may provide pretreatment for other stormwater BMPs by capturing large sediments. The sediment and pollutant removal efficiency of catch basins depends on the size of the sump and the performance of routine maintenance to retain the available sediment storage space in the sump. Where catch basins with sumps are proposed, the minimum two feet separation between the bottom of the sump and seasonally high water table shall be provided.
3. Open or perforated conveyance piping. Where adequate separation to the seasonal high water table exists, stormwater from the development site may be conveyed to a stormwater basin via a system of perforated pipes. These pipes may be made of PVC or corrugated metal and are available with perforations of varying size and spacing. Perforated pipe specifications shall be certified by a Professional Engineer. A Professional Engineer shall certify that perforated conveyance piping will not act to intercept the seasonal high water table and convey groundwater to the stormwater basin. All open or perforated stormwater conveyance systems shall be installed with a minimum separation of two (2) feet from the seasonal high water table.

Section XII. Additional Sources for Technical Guidance.

A. NJDEP Technical Guidance Sources.

1. New Jersey BMP Manual. Available from the Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418, Trenton, New Jersey 08625; or online at http://www.njstormwater.org.
2. NJDEP Stormwater Management Facilities Maintenance Manual. Available from the Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418, Trenton, New Jersey 08625; or online at http://njedl.rutgers.edu/ftp/PDFs/1188.pdf .

B. Additional Guidance Sources.

1. New Jersey Pinelands Commission, PO Box 7, 15 Springfield Road, New Lisbon, New Jersey 08064; Phone: 609-894-7300; Website: http://www.state.nj.us/pinelands.
2. State Soil Conservation Committee Standards for Soil Erosion and Sediment Control in New Jersey. Available from all State Soil Conservation Districts, including Ocean County Soil Conservation District, 714 Lacey Road Forked River, NJ 08731, Telephone Number: (609) 971-7002, Fax Number: (609) 971-3391
3. Ocean County Soil Conservation Districts.
4. New Jersey Department of Transportation, PO Box 600, Trenton, NJ 08625-0600; Phone: 609-530-3536; Website: http://www.state.nj.us/transportation.

APPENDIX D - MITIGATION PLAN CRITERIA & LIST OF PROJECTS

MITIGATION PLAN CRITERIA

The following criteria is required for a mitigation plan proposal in conjunction with a proposed development that is granted a variance or exemption from the stormwater management design and performance standards of the Township's Land Development Ordinance.

Proposed: Mitigation Project Criteria:

- The mitigation project must be implemented in the same drainage area as the proposed development. If a suitable site cannot be located in the same drainage area as the proposed development, the mitigation project may provide mitigation that is not equivalent to the impacts for which the variance or exemption is sought, but that addresses the same issue. For example, if a variance is given because the 80 percent TSS requirement is not met, the selected project may address water quality impacts due to fecal impairment. Listed below are specific projects that can be used to address the mitigation option.

- The project must provide additional benefits and/or protection for groundwater recharge, stormwater runoff quality and quantity from previously developed property that does not currently meet the design and performance standards outlined in the Municipal Stormwater Management Plan.

- The developer must ensure the long-term maintenance of the project, including the maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater BMP Manual.

- The applicant can select one of the following projects listed to compensate for the deficit from the performance standards resulting from the proposed project. More detailed information on the projects can be obtained from the Township Engineer. Listed below are specific projects that can be used to address the mitigation requirement.

- The mitigation proposal must demonstrate that there will be no detrimental impacts as part of the said proposal to downstream water bodies or properties.

- The mitigation proposal shall exceed the requirements of what would have been required as part of the original project in regards to water quality, quantity and/or recharge.

Proposed: Mitigation Project Submission Requirements:

Impact from noncompliance - provide documentation quantifying what would be required for the project to achieve the standards, the extent to which this value will be achieved on site and the extent to which the value must be mitigated off site.

- Supporting information regarding the need for the waiver including;

    1. The waiver cannot be due to a condition created by the applicant. If the applicant can comply with the Stormwater Management rules through a reduction in the scope of the project, the applicant has created the condition and a waiver cannot be issued. Demonstrate that the need for a waiver is not created by the applicant.

       However, subject to approval by the appropriate Land Use Board and the Toms River Township Department of Community Development, the applicant can propose a mitigation proposal that will exceed what would have been required onsite as a way to potently acquire a waiver.

    2. Provide supporting documentation of the site conditions, particular to the subject property, that prevent the construction of a stormwater management facility that would achieve full compliance with the design and performance standards. Site conditions may include soil type, the presence of karst geology, acid soils, a high groundwater table, unique conditions that would create an unsafe design, as well as conditions that may provide a detrimental impact to public health, welfare and safety.

    3. Demonstration that the grant of the requested waiver/exemption would not result in an adverse impact that would not be compensated for by off site mitigation.

- Sensitive Area - Identify areas that are sensitive to the proposed activity related to the performance standard form which a waiver is sought. Demonstrate that the mitigation site contributes to the same sensitive area.

- Design of the Mitigation Project - Provide the design details of the mitigation project. This includes, but is not limited to, drawings, calculations and other information needed to evaluate the mitigation project.

- Responsible Party - List the party or parties responsible for the construction and the maintenance of the mitigation project. Documentation must be

provided to demonstrate that the responsible party's aware of, has authority to, and accepts the responsibility for construction and maintenance. Under no circumstance shall the responsible party be an individual single-family homeowner.

- Maintenance - Include a maintenance plan that addresses the maintenance criteria at N.J.A.C. 7:8-5:8. In addition, if the maintenance responsibility is being transferred to the municipality or another entity, the entity responsible for the cost of the maintenance must be identified. The municipality may provide the option for the applicant to convey the mitigation project to the municipality, if the applicant provides for the cost of maintenance in perpetuity. The estimate shall be prepared by the applicant and approved by the Township Engineer.

- Permits - Obtain any and all necessary local, State or another applicable permit for the mitigation measures or project must be obtained prior to the municipal approval of the project for which mitigation is being provided.

- Construction - Demonstrate that the construction of the mitigation project coincides with the construction of the proposed project. A certificate or occupancy or final approval by the municipality for the project requiring mitigation cannot be issued until the mitigation project or measure receives final approval. Any mitigation projects proposed by the municipality to offset the stormwater impacts of that municipality's own projects must be completed within 6 months of the completion of the municipal project. In order to remain in compliance with their NJDPES General Permit.

LIST OF MITIGATION PROJECTS

#1 Water Quality Project s- Based on the fact that the Township of Toms River is a mature Township from a development standpoint, and a significant amount of development has occurred adjacent to the Township's coastlines, there are a significant amount of untreated stormwater outfalls that discharge directly to the Barnegat Bay. It is the Township's thought that treating these outfalls for water quality has the greatest chance of an immediate improvement to be realized by the Barnegat Bay.

This project would mitigate a waiver of relief from the requirement of removing 80% TSS from a project's stormwater outfall by installing (2) subsurface water quality chambers immediately upstream of existing outfalls (that discharge directly to the Barnegat Bay, or an adjoining lagoon). The chambers to be provide will by of a type that does not require cartridges, filters etc. and that can be maintained by Department of Public Works personal by cleaning and sediment removal only. The chambers shall provide a minimum of 50% TSS each.

#2 Water Quality, Quantity & Recharge Projects- Upgrade Township Regional Stormwater Basins from vegetated bottom to Sand Bottom type (if soil conditions permit) to promote recharge, infiltration & associated flow reductions and to enhance water quality.

#3 Water Quality & Recharge Projects - Upgrade privately owned basins that various Homeowners Associations are seeking the Township to take ownership of and upgrade them from vegetated bottom to Sand Bottom type (if soil conditions permit) to promote recharge, infiltration & associated flow reductions and to enhance water quality.

#4 Water Quality

Provide goose management measures, including public education at Bayside Park.

Mitigation Fund:

As a method to fund future mitigation projects, provide future maintenance for mitigation projects and to possibly combine funding to provide larger more regional mitigation projects, the Township will adopt an ordinance to setup an account for financial management of these projects.

APPENDIX E – BUILD OUT ANALYSIS

The procedure listed below was utilized to prepare the following build out analysis. It should be noted however that the quantities, calculations and conclusions are only as good as the base information that was utilized. Areas of existing impervious surfaces, wetlands boundaries, and flood zones were all based on NJDEP GIS information and are all subject to adjustment subject to actual field studies, ground surveys and NJDEP assigned buffer widths for wetlands and stream corridors.

Methodology for NJDEP Storm Water Build-Out Analysis

Process step 1

Process description: Create Zoning Layer and "Zone Field", "Zone Description Field", and "Allowable Impervious Surface Percentage" based on Land Use Ordinance

Process step 2

Process description: Take NJDEP HUC 14 data, narrow down the attribute fields to only needed fields and create a total acreage for each HUC 14.

Process step 3

Process description: Use the NJDEP 2002 Land Use Land Cover data and cut down the attribute fields to what is needed.

Process step 4

Process description: Create a Developable Land/Constrained Land data layer based on: (Constraints include Rights of Ways, Wetlands, And Waters and their Buffers. Buffers were 300 Foot for the Toms River and 50 foot for all other water bodies.

Process step 5

Process description: Calculate the areas of all layers. Based on calculated geo-database Shape Area field / 43560

Process step 6

Process description: Use the Union commands in ESRI software to Union all Layers and their respective areas. Clean up file.

Process step 7

Process description: Create new field and calculate the impervious surface of each land use area by using the shape area field, and the impervious percentage.

Process step 8

Process description: merge all land use areas based on the respective zone and then recalculate the existing impervious areas by summing the areas of total areas of the impervious surface based on the zone then using the merge commands to merge the layer based on zone.

Process step 9
Process description: Write Metadata

Process step 10
Process description: Export database file to excel spreadsheet

Process step 11
Process description: clean up table for Management Plan