

MOUNT HOLLY TOWNSHIP

MUNICIPAL

**STORMWATER MANAGEMENT PLAN
(MSWMP)**

FEBRUARY 2005

Revised: May 2007

(Required By NJPDES Permit Number NJGO147796)

**Prepared In Accordance With NJAC 7:8-4.2,
“Stormwater Management Rules”**

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for Mount Holly Township (“the Township”) to address stormwater-related impacts. The creation of this plan is required by NJAC 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in NJAC 7:8 Stormwater Management Rules. The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acre of land. 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 in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

A “build-out” analysis has been included in this plan, based upon existing zoning and land available for development. The plan also addresses the review and update of existing ordinances, the Township Master Plan, and other planning documents to allow for project designs that include low impact development techniques. The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

Goals

The goals of this MSWMP are 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

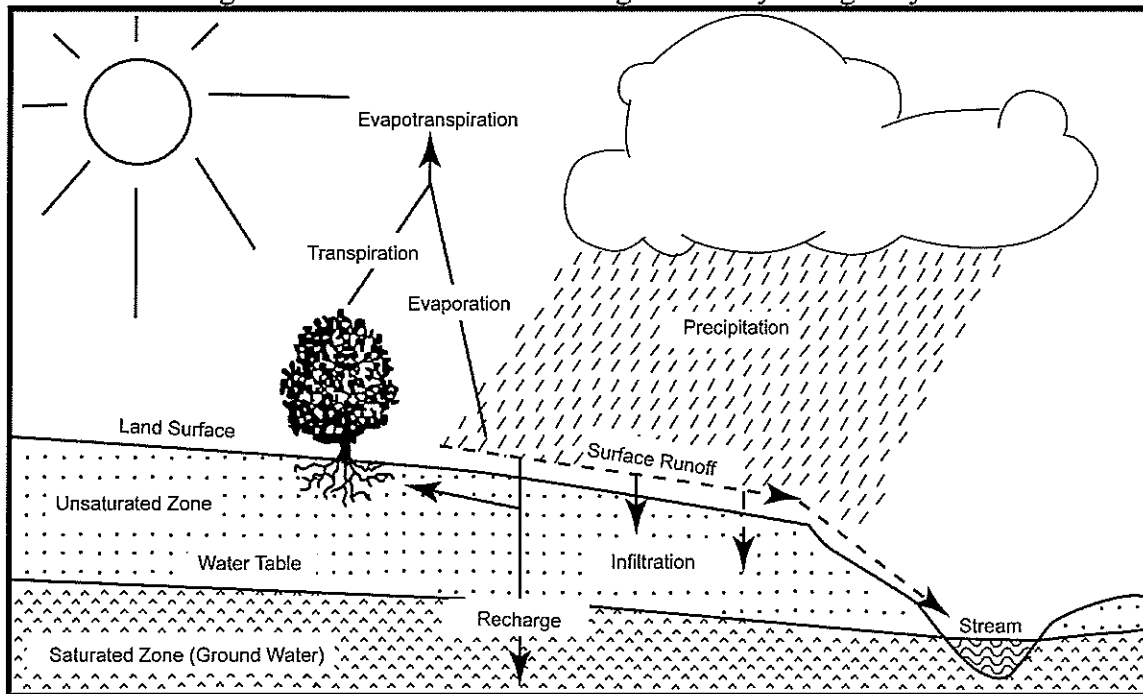
- protect public safety through the proper design and operation of stormwater basins.

To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities. The plan also outlines safety standards for stormwater infrastructure to be implemented to protect public safety.

Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (See Figure C-1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

Figure C-1: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, pathogens, and nutrients.

In addition to increased pollutant loading, land development can adversely affect water quality and stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or stored in detention or retention basins can become heated and raise the temperature of the downstream waterway, adversely affecting cold water fish species such as trout. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

Background

The Township encompasses a 2.88 square mile area in Burlington County, New Jersey. The Township population has decreased from 10,818 in 1980 to 10,728 in 2000, and the town is actually “built-out” for all practical purposes. Figure C-2 illustrates the waterways in the Township. Figure C-3 depicts the Township boundary on the USGS quadrangle maps.

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 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 nonimpaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. The North Branch of the Rancocas Creek flows through Mount Holly. Buttonwood Run flows through the Woolman Lake system and discharges to Mill Race, which flows to the Rancocas, at Mill Street. Geese pollution is adversely affecting the water quality of the Woolman Lakes. The Rancocas, entering Mount Holly, may be degraded by septic systems along its banks in Eastampton Township and Mount Holly upstream of Mill Dam, which is the end of tidal Rancocas. There is also the possibility of adverse stream quality impacts from multiple properties housing livestock in Ewansville, as well as septic impacts from trailer parks. The NJ Impairment Score for the North Branch of the Rancocas Creek at Pine Street (AMNET Station AN0151) in 97/98 was 3, which equates to a “severely impaired” stream.

**Mt. Holly Township
USGS Topography**



Created by Burlington County
Office of Resource Conservation
October 2004

Sources: Burlington County Engineering
municipal boundaries, USGS topography

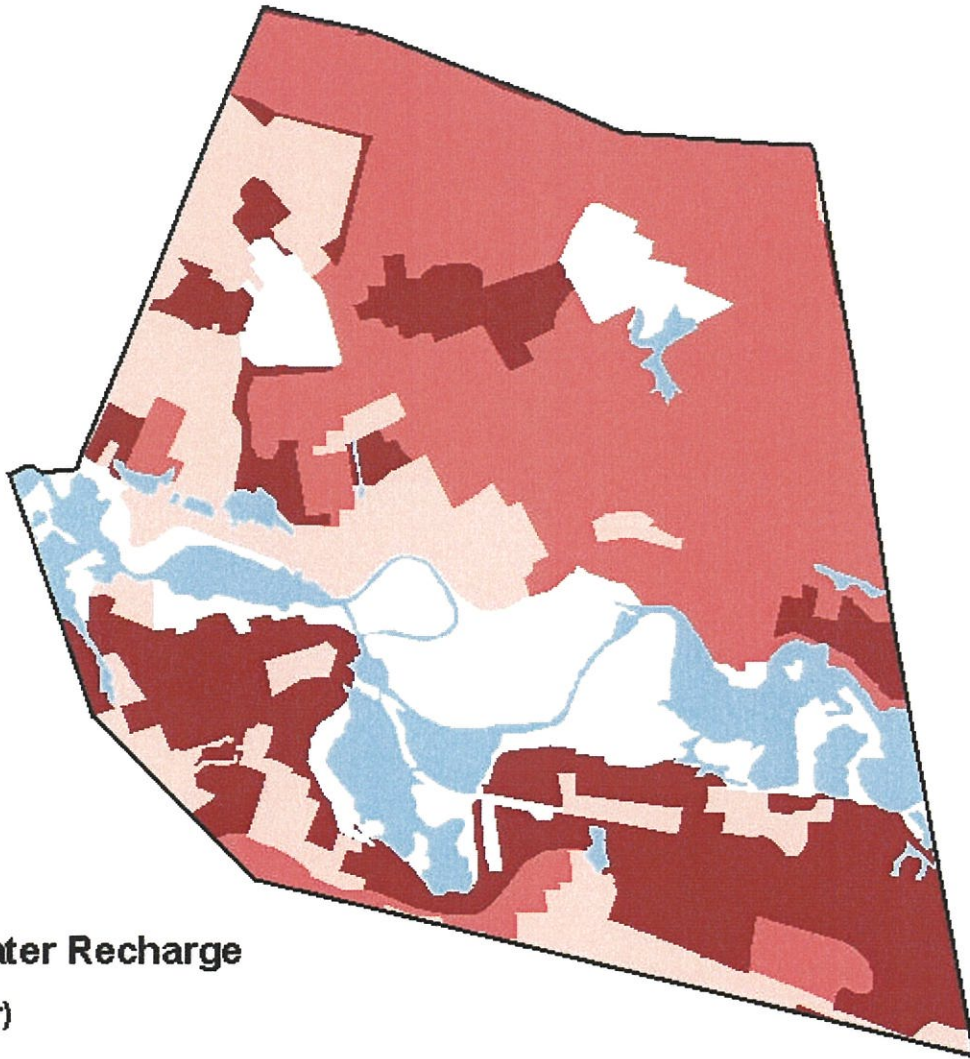
In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the state. These data show that the North Branch of the Rancocas Creek in Mount Holly Township exceeds State criteria. A Total Maximum Daily Load (TMDL) for fecal coliform has been established for the creek. The TMDL number for the creek is 22, and waste load allocation is 94%.

A 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 nonpoint source, which includes 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 BMPs.

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. This combined report presents the extent to which New Jersey waters are attaining water quality standards, and identifies waters that are impaired. Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDLs are needed.

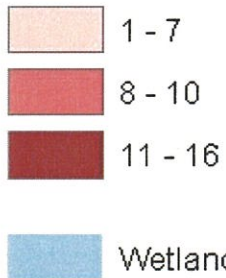
In addition to water quality problems, the Township has exhibited some water quantity problems including flooding and stream and lake bank erosion. Some of the culverts associated with road crossings in the Township are undersized. During severe storm events, these undersized culverts do not have adequate capacity, thereby causing a backwater effect and flooding upstream, especially at Woolman Dam on Branch Street.

**Mt. Holly Township
Groundwater Recharge Rates
& Wetlands**



Groundwater Recharge

(Inches/year)



Created by Burlington County
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October 2004

Sources: Burlington County Engineering municipal boundaries,
NJDEP wetlands, NJ Geological Survey (NJGS) groundwater recharge rates.
Breakdown of recharge rates based on state-wide values determined by NJGS.

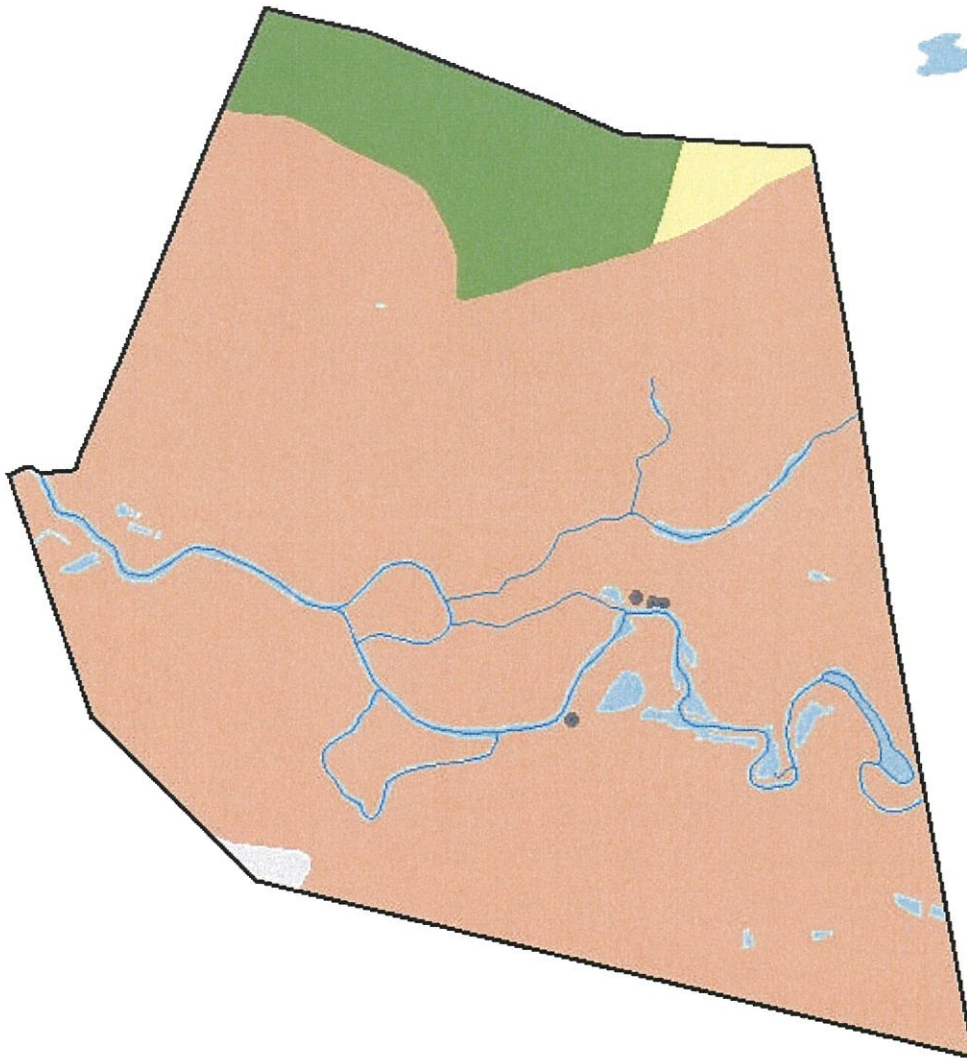
**Mt. Holly Township
Well Head Protection Areas,
HUC-14's and Waterways**



Well Head Protection Areas

● Confined Wells
(50 ft. radius)

Lakes



HUC-14's

	02040201100020
	02040201100030
	02040202040050
	02040202070030

Created by Burlington County
Office of Resource Conservation
October 2004

Sources: Burlington County Engineering municipal boundaries,
NJGS Well head protection areas for public community water
supply wells, NJDEP HUC-14 boundaries & water features

Design and Performance Standards

The Township will adopt the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. The ordinances will be submitted to the county for review and approval within [24 months of the effective date of the Stormwater Management Rules.]

During construction, Township inspectors will observe the construction of the project to verify that the stormwater management measures are constructed in general conformance with approved plans. A draft copy of the Stormwater Control Ordinance is included in Appendix A.

The Township will be developing Maintenance Plans (in accordance with the BMP) to assure the continued maintenance of its existing stormwater facilities. The Township currently, and will continue to, operate and maintain its existing facilities

Plan Consistency

A TMDL for fecal coliform has been established for the North Branch of Rancocas Creek. When RSWMPs or other TMDLs are developed in the future, the Municipal Stormwater Management Plan will be updated to be consistent with the RSWMP.

The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) at NJAC 5:21. The municipality will utilize the most current update of the RSIS in the stormwater management review of residential areas. This Municipal Stormwater Management Plan will be updated to be consistent with any future updates to the RSIS.

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, Township inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the local Soil Conservation District.

Nonstructural Stormwater Management Strategies

The Township has reviewed the master plan and ordinances, and has provided a list of the sections in the Township land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater management strategies. These are the ordinances identified for revision. They will be submitted to the county review agency for review and approval by

April 1, 2006. A copy will be sent to the Department of Environmental Protection at the time of submission.

Chapter 149 of the Township Code, entitled Land Use, was reviewed with regard to incorporating nonstructural stormwater management strategies. Some changes will be made to Article XXXI of Paragraph 149-204 of this Chapter, entitled “Improvements” to incorporate these strategies:

Section 149-205E: Public Use and Service Areas requires that natural features such as brooks, trees, swamps, and views be preserved wherever possible. This section will be amended to add that care will be taken to preserve selected trees to enhance soil stability and landscaped treatment of the area.

Section 179: Off-Street Parking Area Design Requirements of the Mount Holly Code will be amended to allow porous pavement to be constructed for parking areas. Vegetated swales will be allowed to remove stormwater as long as no ponding is formed which could become a place for mosquito breeding.

Section 149-205F: Soil Erosion and Sediment Control will be added which will require compliance with the New Jersey Soil Erosion and Sediment Control Standards. These standards outline some general design principles including, wherever possible, retain and protect natural vegetation; minimize and retain water runoff to facilitate groundwater recharge; and install diversions, sediment basins, and similar required structures prior to any on-site grading or disturbance.

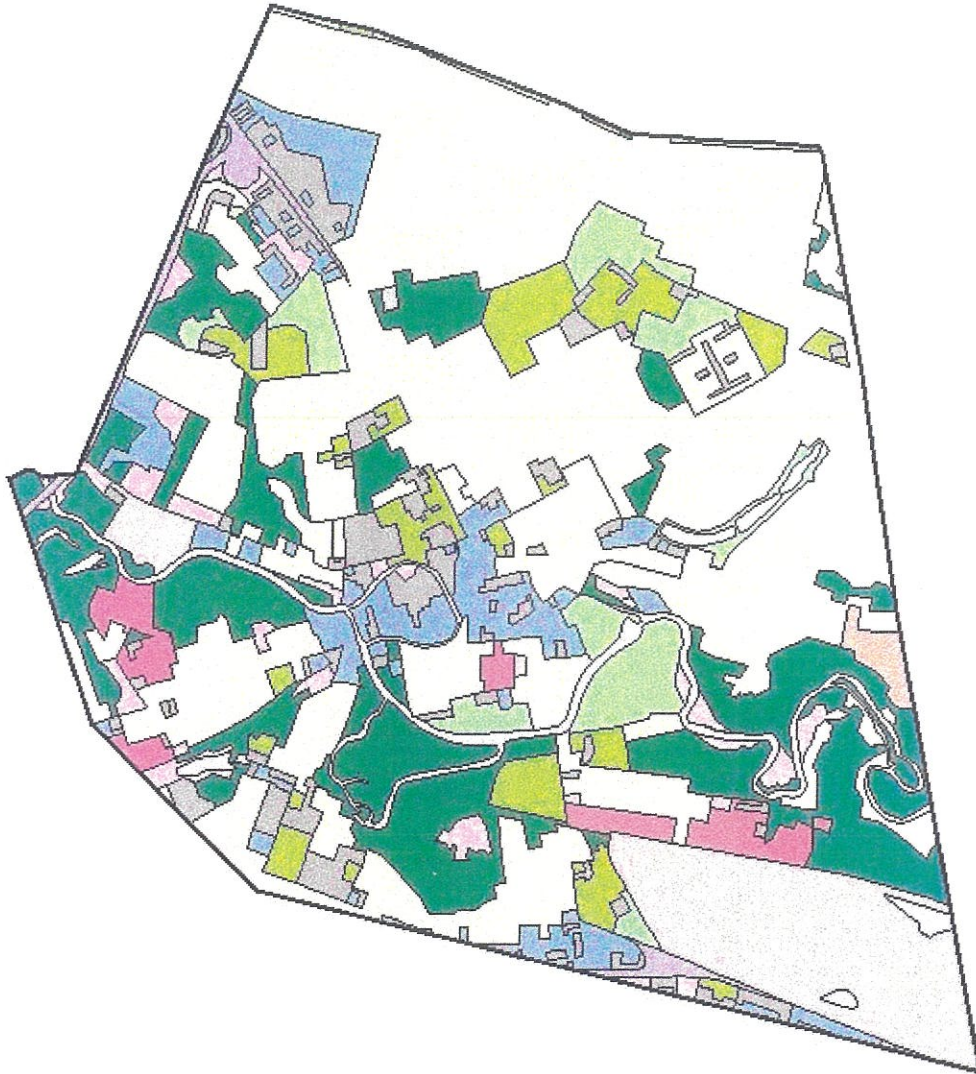
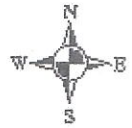
Sections 149-81A: Regulations Applicable to All Zones will be added. It will provide pollution source control. It will prohibit materials or wastes to be deposited upon a lot in such form or manner that they can be transferred off the lot, directly or indirectly, by natural forces such as precipitation, evaporation, or wind. It also will require that all materials and wastes that might create a pollutant or a hazard be enclosed in appropriate containers.

The Township Code will be amended to remind developers that satisfying percent impervious requirements does not relieve them of responsibility for complying with the Design and Performance Standards for Stormwater Management Measures contained in Section 149-204 Storm Drainage. The Township will determine the maximum allowable impervious cover for each zone to determine what percentage of impervious cover is appropriate. Also, if a developer is given a variance to exceed the maximum allowable percent imperviousness, the developer will be required to mitigate the impact of the additional impervious surfaces. This mitigation effort must address water quality, flooding, and groundwater recharge.

Land Use/Build-Out Analysis

A detailed land use analysis for the Township was conducted. Figure C-5 illustrates the existing land use in the Township based on 1995/97 GIS information from NJDEP. Figure C-4 illustrates the HUC14s within the Township. The Township zoning map is shown in Figure C-6. The build-out calculations for impervious cover are shown in Table C-1. As expected when developing agricultural and forest lands, the build-out of these two HUC14s will result in a significant increase in impervious surfaces. The adoption of the stormwater control ordinance and this plan address measures to reduce the impacts of increased impervious surface. The pollutant loads at full build-out are presented in Table C-2.

Mt. Holly Township Land Use Classification



Land Use

Agriculture	Recreation
Commercial	Residential
Community Services	Transportation
Manufacturing	Utility
Military	Vacant
Mining	Water
Parking	Wooded

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October 2004

Sources: Burlington County Engineering municipal
boundaries, DVRPC 2000 Land Use Data

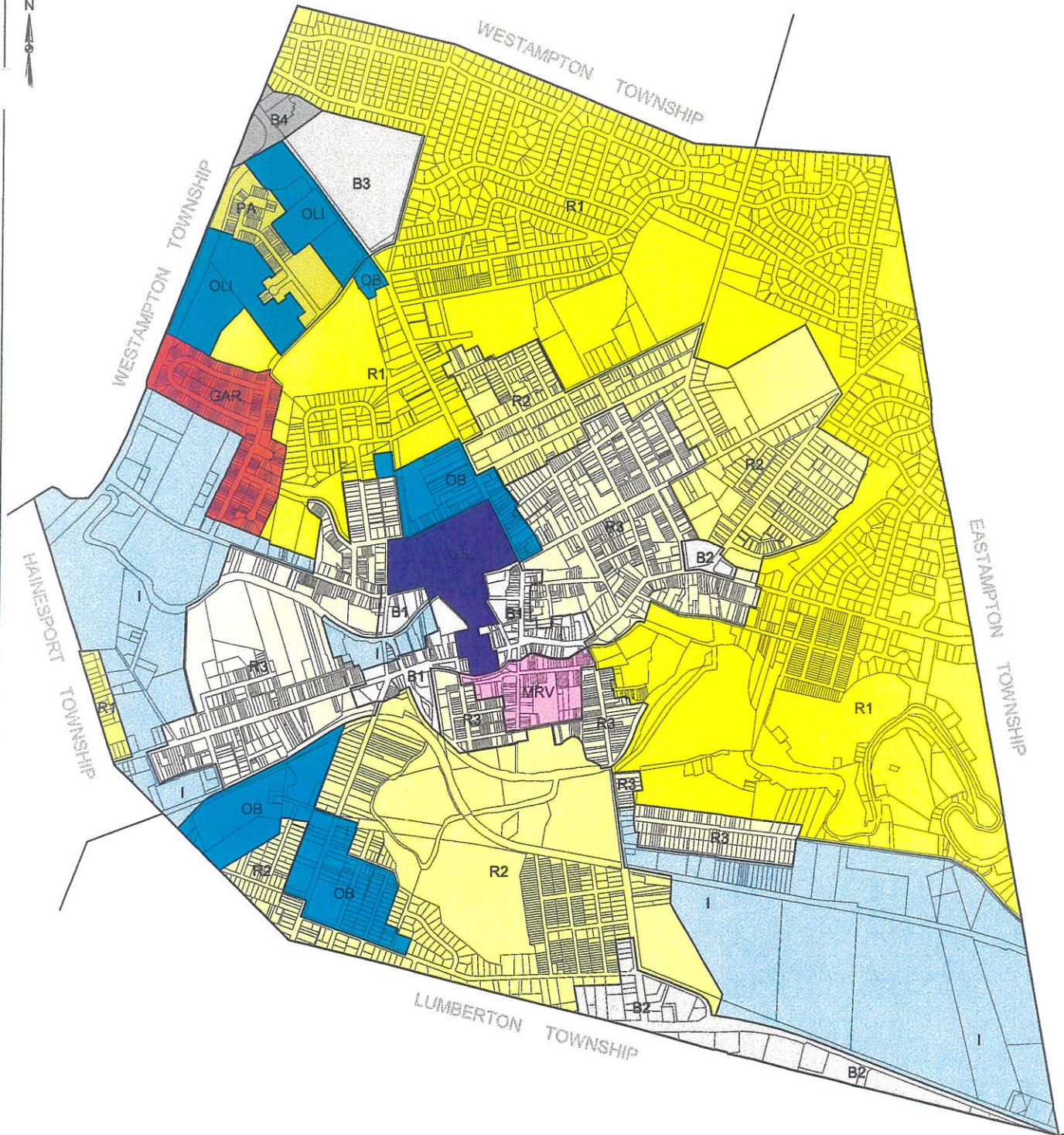
FIGURE C5

Table C-1: Build-Out Calculations for HUC14s

HUC14 and Zone	Total Area (Acres)	Wetlands/ Water Area (Acres)	Developable Area (Acres)	Allowable Impervious (%)	Build-Out Impervious (Acres)
02040201100030					
Planned Shopping District (B3)	2.93	0.00	2.93	70%	2.05
Standard Business District (B4)	2.23	0.00	2.23	70%	1.56
Residence District 1 (R1)	159.30	0.00	159.30	70%	111.51
TOTALS	164.46	0.00	164.46	70%	115.12
02040201100020					
Residence District (R1)	20.90	0.00	20.90	70%	14.63
TOTALS	20.90	0.00	20.90	70%	14.63
02040202040050					
Central Business District (B1)	32.98	0.65	32.33	70%	22.63
General Business District (B2)	39.70	0.00	39.70	70%	27.79
Planned Shopping District (B3)	25.52	0.00	25.52	70%	17.86
Standard Business District (B4)	5.40	0.00	5.40	70%	3.78
Gardens Area Redevelopment (GAR)	31.31	0.01	31.30	70%	21.91
Government Services (GS)	26.10	0.00	26.10	70%	18.27
Limited Industrial District (I)	290.54	26.19	264.35	70%	185.05
Mill Race Village District 1 (MRV)	15.73	0.00	15.73	70%	11.01
Office Building (OB)	65.98	0.69	65.29	70%	45.70
Office & Light Industry District (OLI)	39.85	0.00	39.85	70%	27.90
Apartment Townhouse District (PA)	19.64	0.00	19.64	70%	13.75
Residence District 1 (R1)	515.11	76.99	438.12	70%	306.68
Residence District 2 (R2)	307.69	47.28	260.41	70%	182.29
Residence District 3 (R3)	223.96	14.95	209.01	70%	146.31
TOTALS	1,639.51	166.76	1,472.75	70%	1,030.93
02040202070030					
Office Building (OB)	2.58	0.00	2.58	70%	1.81
Residence District 2 (R2)	6.26	0.00	6.26	70%	4.38
TOTALS	8.84	0.00	8.84	70%	6.19

Table C-2: Nonpoint Source Loads at Build-Out

HUC14 and Zone	Build-Out Zoning	Developable Area (Acres)	TP (lbs/acre/yr)	TP (lbs/yr)	TN (lbs/acre/yr)	TN (lbs/yr)	TSS (lbs/acre/yr)	TSS (lbs/yr)
02040201100030								
Planned Shopping District (B3)	Commercial	2.93	2.1	6.15	22	64.46	200	586.00
Standard Business District (B4)	Commercial	2.23	2.1	4.68	22	49.06	200	446.00
Residence District 1 (R1)	High, Medium Density Residential	159.30	1.4	223.02	15	2,389.50	140	22,302.00
TOTAL S		164.46		233.86		2,503.02		23,334.00
02040201100020								
Residence District (R1)	High, Medium Density Residential	20.90	1.4	29.26	15	313.50	140	2,926.00
TOTAL S		20.90		29.26		313.50		2,926.00
02040202040050								
Central Business District (B1)	Commercial	32.33	2.1	67.89	22	711.26	200	6,466.00
General Business District (B2)	Commercial	39.70	2.1	83.37	22	873.40	200	7,940.00
Planned Shopping District (B3)	Commercial	25.52	2.1	53.59	22	561.44	200	5,104.00
Standard Business District (B4)	Commercial	5.40	2.1	11.34	22	118.80	200	1,080.00
Gardens Area Redevelopment (GAR)	High, Medium Density Residential	31.30	1.4	43.82	15	469.50	140	4,382.00
Government Services (GS)	Urban, Mixed Urban, Other Urban	26.10	1.0	26.10	10	261.00	120	3,132.00
Limited Industrial District (I)	Industrial	264.35	1.5	396.53	16	4,229.60	200	52,870.00
Mill Race Village District 1 (MRV)	Commercial	15.73	2.1	33.03	22	346.06	200	3,146.00
Office Building (OB)	Urban, Mixed Urban, Other Urban	65.29	1.0	65.29	10	652.90	120	7,834.80
Office & Light Industry District (OLI)	Commercial	39.85	2.1	83.69	22	876.70	200	7,970.00
Apartment Townhouse District (PA)	High, Medium Density Residential	19.64	1.4	27.50	15	294.60	140	2,749.60
Residence District 1 (R1)	High, Medium Density Residential	438.12	1.4	613.37	15	6,571.80	140	61,336.80
Residence District 2 (R2)	High, Medium Density Residential	260.41	1.4	364.57	15	3,906.15	140	36,457.40
Residence District 3 (R3)	High, Medium Density Residential	209.01	1.4	292.61	15	3,135.15	140	29,261.40
TOTAL S		1,472.75		2,162.70		23,008.36		229,730.00
02040202070030								
Office Building (OB)	Urban, Mixed Urban, Other Urban	2.58	1.0	2.58	10	25.80	120	309.60
Residence District 2 (R2)	High, Medium Density Residential	6.26	1.4	8.76	15	93.90	140	876.40
TOTAL S		8.84		11.34		119.70		1,186.00



ZONING DISTRICT LEGEND:

B1	CENTRAL BUSINESS DISTRICT
B2	GENERAL BUSINESS DISTRICT
B3	PLANNED SHOPPING DISTRICT
B4	STANDARD BUSINESS DISTRICT
GAR	THE GARDENS AREA REDEVELOPMENT
GS	GOVERNMENT SERVICES
I	LIMITED INDUSTRIAL DISTRICT
MRV	MILL RACE VILLAGE REDEVELOPMENT
OB	OFFICE BUILDING
OLI	OFFICE AND LIGHT INDUSTRY DISTRICT
PA	APARTMENT / TOWNHOUSE DISTRICT
R1	RESIDENCE DISTRICT
R2	RESIDENCE DISTRICT
R3	RESIDENCE DISTRICT

**ZONING MAP
MOUNT HOLLY TOWNSHIP
BURLINGTON COUNTY, NEW JERSEY**

NOT TO SCALE
Prepared by: ALAIMO GROUP
DECEMBER 2004

FIGURE C6

NOTES:
1. ZONING INFORMATION TAKEN FROM MT. HOLLY TOWNSHIP ZONING MAP ADOPTED FEB. 6, 1979, LAST UPDATED AUG. 19, 2003.
2. PARCEL MAPPING FROM BURLINGTON COUNTY DEPARTMENT OF INFORMATION TECHNOLOGY UPDATED SEPT. 2002.
3. THIS MAP WAS DEVELOPED USING DIGITAL DATA FROM THE BURLINGTON COUNTY GEOGRAPHIC INFORMATION SYSTEM. THIS MAP IS A SECONDARY PRODUCT AND HAS NOT BEEN VERIFIED BY THE COUNTY OF BURLINGTON. IT IS NOT AUTHORIZED BY THE COUNTY OF BURLINGTON.
4. THIS MAP IS A GIS REPRESENTATION OF THE ZONING MAP.

Mitigation Plans

This mitigation plan is provided for a proposed development that is granted a variance or exemption from the stormwater management design and performance standards. Presented is a hierarchy of options.

Mitigation Project Criteria

1. The mitigation project must be implemented in the same drainage area as the proposed development. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality or 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.
 - a. 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.

Option 1 – Groundwater Recharge

- Retrofit the existing stormwater management basins under Township jurisdiction to provide groundwater recharge.
- Retrofit existing Township facilities (ie., municipal building, library, etc.) with dry wells to provide groundwater recharge.

Option 2 – Water Quality

- Retrofit the existing stormwater management basins under Township jurisdiction to provide water quality measures.
- Retrofit the existing parking facilities at the various municipal facilities to provide the removal of 80 percent of the total suspended solids.
- Implement a public awareness campaign on septic systems to empower septic system owners to identify and repair faulty systems

Option 3 – Water Quantity

- Install stormwater management measures in the open space at various municipal facilities to reduce the peak flow from the upstream development on the receiving streams.
- At beneficial and opportune times, replace existing, undersized culverts contributing to the flooding at Woolman Dam at Branch Street to allow for higher peak flows.

2. If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Option 1, 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 or exemption 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.

Groundwater Recharge

- Install measures on other property owned by developer within the Township.

Water Quality

- Provide goose management measures, including public education at Municipal Parks.

Water Quantity

- Provide beaver management measures, including public education.
3. The municipality may allow a developer to provide funding or partial funding to the municipality for an environmental enhancement project that has been identified in a Municipal Stormwater Management Plan, or towards the development of a Regional Stormwater Management Plan. The funding must be equal to or greater than the cost to implement the mitigation outlined above, including costs associated with purchasing the property or easements for mitigation, and the cost associated with the long-term maintenance requirements of the mitigation measure.