MUNICIPAL STORMWATER MANAGEMENT PLAN

Borough of Mountain Lakes
Morris County, New Jersey

prepared by

Mark M. Prusina, Public Works Manager
Stormwater Management Coordinator

March 2005

LIST OF FIGURES

Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Mountain Lakes ("the Borough") to address stormwater related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. The plan addresses groundwater recharge, stormwater quantity standards for new major development, defined as projects that disturb one or more acres of land. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and the loss of groundwater recharge that provides base flow in receiving water bodies. The plan also describes long-term operation and maintenance measures for existing and future stormwater facilities.

This plan further addresses the review and update of existing ordinances, the Borough Master Plan, and other planning documents to allow for project designs that include low impact development techniques. At this time, the plan excludes any mitigation strategy for when a variance or exemption of the design and performance standard is sought.

Goals

The goals of this MSWMP are:

- Reduce flood damage to 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 instream structures.
- Maintain groundwater recharge.
- Prevent, to the greatest extent feasible, an increase in nonpoint source pollution.
- Maintain the integrity of stream channels for their biological functions, as well as for drainage.
- Minimize pollutants in stormwater 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.
- 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. Preventive 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.

Hydrologic Cycle and Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (see Figure 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 evaporation. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evaporation 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 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. Increase 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.

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.

Land Use & Population Discussion

The Borough of Mountain Lakes encompasses 2.9 square miles in the central part of Morris County. The Borough land use is predominantly residential, with minor portions in office, business and commercial zones. The various existing land uses in the Borough are shown on Figure 3.

According to the 2000 census, the Borough has 4,256 residents, which is an increase of 409 persons over the 1990 census data. Accompanying the population increase were 118 new housing units in the same 10 year period. With very little developable vacant land, no significant population change is expected in the future.

The Borough has 35 acres of developable vacant land. The existing zoning is shown in Figure 2. The Borough is not within the State Plan Designation PA1 Metropolitan Planning Area or in a designated center where infiltration requirements are not applicable.

Surface Water and Groundwater

Troy Brook is the main watercourse in the Borough, and which conducts nearly all of the Borough's storm water. There are five (5) lakes in the Borough which are in series in the headwater tributary drainage area of Troy Brook. The lakes and streams of the Borough appear on Figure 3. Mountain Lakes lies within both the Whippany River watershed and the Rockaway River watershed, with approximately 1,680 acres draining to the Whippany, and approximately 190 acres draining to the Rockaway.

The average annual groundwater recharge rates are shown graphically in Figure 4. The USGS Soil Survey information is shown on Figure 5. There are designated wetland areas in the Borough.

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 in New Jersey 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 well head protection area to be controlled by the water purveyor in accordance with Safe Drinking Water Regulations (see NJAC 7"10-11.7(b)1)."

WHPA 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. As shown on Figure 6, a significant portion of the Borough is covered by Tiers 1, 2 & 3 well head protection areas.

Watershed Management Area

Mountain Lakes lies in Watershed Management Area WMA 6 which includes the Whippany and Rockaway River watersheds. Watershed Management Area 6 (WMA 6) represents the area drained by waters from the upper reaches of the Passaic River Basin including the Passaic River from its headwaters in Morris County to the confluence of the Pompton River. WMA 6 is characterized by extensive suburban development and reliance upon ground water sources for water supply. WMA 6 lies in portions of Morris, Somerset, Sussex and Essex counties and includes the Upper and Middle Passaic River, Whippany River and Rockaway River Watersheds

Within Watershed Management Area WMA 6, there are further drainage area designations delineated by hydraulic unit code (HUC) designations. The HUC system starts with the major watersheds in the WMA, and then subdivides into progressively smaller sub watersheds.

A drainage area with a hydrologic unit code (HUC) designation with 14 numbers, or HUC-14, is one of several sub watersheds of a larger watershed with 11 numbers, or a HUC-11. Two HUC-11 divisions are within Mountain Lakes; the Whippany River basin, and the Rockaway River basin. There is one (1) HUC-14 division within the Whippany River basin, and four (4) HUC-14 divisions within the Rockaway River basin as shown in Figure 7.

Water Quality

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 through 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 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. There are 49 AMNET sites in Watershed Management Area WMA 6 in the upper Passaic, Whippany, Rockaway and Dead River watersheds.

Within the Borough of Mountain Lakes, there is one (1) AMNET site, AN0236, which is located on Troy Brook at Lake Drive. The next downstream AMNET site is AN0237 which is located on Troy Brook in Parsippany-Troy Hills at Beverwyck Road.

Existing Stormwater Management

Stormwater management has long been a goal of the Borough of Mountain Lakes as evidenced by the following:

1. Borough stormwater ordinances that address stormwater quantity and quality.

2. Stream corridor protection measures.

3. Compliance with Residential Site Improvement Standards.

4. Participation in the Rockaway River and Whippany River Basin programs.

5. Planning Board and Board of Adjustment approvals which include requirements for surface water and groundwater management plans.

6. Department of Public Works activities including:

   - Covered storage of all salt/sand materials
   - Proper fueling and maintenance of vehicles
   - Proper housekeeping for all DPW facilities
   - Inspection of storm drains and catch basins
   - Street sweeping program

Design and Performance Standards

The Borough 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 month of the effectiveness date of the Stormwater Management Rules.

Plan Consistency

The Borough is not within a Regional Stormwater Management Planning Area and no Total Maximum Daily Loads (TMDL's) have been developed for waters within the Borough. Therefore this plan does not need to be consistent with any regional stormwater plans (RSWMPs) nor any TMDL's. If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

The Borough is within the Whippany River Basin and much information on the basin and about its characteristics has been developed as part of the Whippany River Plan.

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

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

Nonstructural Management Strategies

Mountain Lakes has reviewed the master plan and ordinances with regard to incorporating nonstructural stormwater management strategies. Once the ordinance changes are accomplished, they will be submitted to the County for review as prescribed in the Borough's stormwater permit. The Master Plan will likewise be amended for consistency with the permit and any newly adopted ordinances.

Land Use/Build-Out Analysis

Since the Borough has a vacant land area of less than one square mile, the Borough is not required to do a build-out analysis.

Mitigation Plans

Since there is minimal developable vacant land, the Borough will review the need for any mitigation options. This review will include the detailed guidance on mitigation plans, which is reportedly being distributed by NJDEP.

Recommend Implementing Stormwater Control Ordinances

The Borough currently has pet waste control, litter control, improper dumping, feeding of non-confined wildlife and yard waste ordinances in place but will need to implement an enforced illicit connections ordinances and possibly modify the existing ordinances.