

SCHOOR DEPALMA
Engineers and Consultants

STORMWATER MANAGEMENT PLAN

FOR THE

TOWNSHIP OF MOUNT OLIVE
County of Morris
New Jersey

PREPARED BY:

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1.0 STATEMENT OF INTENT

This Municipal Stormwater Management Plan and the implementing Ordinances will provide protection from stormwater related water quantity and quality impacts of new and existing development as required by all applicable state laws and regulations including the New Jersey Department of Environmental Protection regulations. This Plan and implementing Ordinances ensure the long-term operation and preventative and corrective maintenance of the stormwater management measures required. This Plan and Ordinances ensure the protection of public safety as related to the stormwater management measures required.

2.0 AUTHORITY

The authority to prepare and implement municipal stormwater management plans in New Jersey is clearly established at varying levels of government.

At the Federal level the Clean Water Act establishes requirements for stormwater management which are implemented at the state and local levels.

At the State level there are several statutes which provide the authority for establishing and implementing municipal stormwater management plans. The Stormwater Management Act, PL 1981 c 32, amends and supplements the Municipal Land Use Law (MLUL) N.J.S.A. 40:55D-1 et seq. The MLUL delegates land use powers to the local governing body, which is the municipality. The municipalities have the authority to develop and implement master plans and implementing ordinances. The MLUL includes the Stormwater Management Act, P.L. 1981.c32, which directs each municipality to develop and adopt a Stormwater Management Plan and Stormwater Control Ordinances to implement the Stormwater Management Plan. The Stormwater Management Act also includes a grant program whereby municipalities could obtain state funding to meet the stormwater planning objectives.

The State also has authorizing statutes which address water quantity and quality impacts associated with stormwater including the Water Quality Planning Act N.J.S.A. 58:11A et seq, the Water Pollution Control Act N.J.S.A. 58:10A-1 et seq, the Flood Hazard Control Act N.J.S.A. 58:16A-50 et seq and the Dam Safety Act N.J.S.A. 58:4-1 et seq.

3.0 BACKGROUND

Introduction

The goals of stormwater management have changed over time. The original focus was on water quantity for the purpose of dealing with on site flood control and drainage management. With time the need to also address downstream flooding was included. Today stormwater management includes these as well as efforts to control on site and off site water quality impacts. Stormwater management programs must take both the quantity and quality goals into consideration. Municipalities must now move forward and modify existing programs.

Issues associated with stormwater are the result of land use changes. With increased development comes increases in the amount or volume of stormwater runoff, the rate of the runoff and the pollutants carried in the runoff. Groundwater recharge can be impacted where a change in the land use results in more water leaving the site. Other impacts include increased sedimentation, accelerated stream bank erosion and impaired water quality.

The pollutants in stormwater come from a number of sources. Pollutants that can be picked up by stormwater as it runs over the land include; metals, oils and grease from cars and roads; pesticides and fertilizers from lawns, pet and wildlife waste; sediment from construction sites; deicing salt and chemicals for roads. As these pollutants are not generated by any specific identifiable point, they are called nonpoint source pollution. Illegal connections into the stormwater system or between stormwater and sanitary sewers are other sources of pollutants which may be added to stormwater.

To address all potential stormwater impacts it is necessary to deal with both new development and existing development. It is only in recent years, beginning in the mid-1970s, that stormwater issues have been addressed for new development. Thus all preceding development was done with little or no attention to these issues. Further, the site-by-site approach imposed for new development may not have been the best approach from a regional perspective and thus may not have provided optimum stormwater management.

General Description of the Municipality

The Township of Mount Olive is located in the Northwest corner of Morris County. It is bounded by Roxbury Township to the east, Chester Township to the south, Washington Township and Hackettstown to the west and Allamuchy, Byram, Stanhope and Netcong to the north. The Township consists of 30.44 square miles of land area and .7 miles of water area including Budd Lake, the largest natural lake in the state. The Township is located within two major watersheds, the Musconetcong and Raritan River basins. The major rivers located within the Township are the Musconetcong River and the South Branch of the Raritan River.

The Township existed as a rural, largely undeveloped community with a large agricultural areas separated by forested hills. However in recent years there has been a rapid change toward more suburban development. Approximately 38% of the Township is now developed, 16% has been preserved as open space, 14% is used for agriculture and the remaining 5% are lands managed as a potential water supply source and not open for public use. Thus, Mount Olive has 5,841 acres or 27% vacant land remaining.

Mount Olive Township has approximately 40 commercial and residential detention basins. There has been no record since 1984 of downstream flooding from detention basins in the Township.

There are two (2) known areas of flooding in the Township: 1.) Country Club Estates and 2.) residential area in Flanders. These areas have flooding potential based on their proximity to the floodways of the South Branch of the Raritan River and Drake's Brook, respectively. Preliminary design has been initiated for Country Club Estates to provide the development with a stormwater management system since there currently is none. Acquisition of Township owned properties will assist the management of stormwater in providing areas for detention.

A Drainage Master Plan for the Township of Mount Olive was completed in 1989. The Plan delineated the watersheds and drainage basins found in Mount Olive and discussed the nature and effects of the drainage problems facing Mount Olive at the time. It recommended solutions, priority projects and cost estimates for same. Examples of suggested improvements included: storm sewer installation or upgrades, stream cleaning and stabilization, construction of regional detention basins, modification of existing dams and development of a comprehensive maintenance program. A phased 10-year program was recommended. The Township is in need of an update to this Drainage Master Plan to map and further evaluate existing conditions of stormwater management facilities and to assess future development on same. The Township will identify and implement a schedule for updating of the Plan in accordance with available funding sources.

Regulatory Requirements

Stormwater management requirements exist in a number of regulatory programs at varying levels of government. However, stormwater management in New Jersey is largely the responsibility of local government.

- **Federal**

The Clean Water Act establishes many requirements which are implemented by the states. With regard to stormwater management the Clean Water Act requires permitting programs for construction, industrial and municipal stormwater runoff.

The Federal Emergency Management Agency implements the National Flood Insurance Program which includes the mapping of flood prone areas and working with local communities to adopt and enforce ordinances consistent with the National Flood Insurance Program.

- **State**

Stormwater Management Rules at N.J.A.C. 7:8 are implemented by the Department of Environmental Protection. These rules address the development of stormwater management plans and ordinances. These new rules provide much more detail with regard to the content of the Stormwater Management Plans including detailed design and performance standards for stormwater management measures. This Municipal Stormwater Management Plan incorporates the requirements included in these rules.

The Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21 are implemented by the Department of Community Affairs. These regulations establish the minimum standards for a number of construction related provisions for residential development. The rules apply to any site improvements in connection with applications for residential subdivision, site plan approval, or variance. The adopted standards include stormwater management provisions.

The Coastal Zone Management Rules at N.J.A.C. 7:7E are implemented by the Department of Environmental Protection. These rules apply to the use and development of the State's coastal resources including the area subject to the Coastal Area Facility Review Act (CAFRA), coastal wetlands and waterfront development. These regulations include stormwater management requirements for coastal development.

The Flood Hazard Rules at N.J.A.C. 7:13 are implemented by the Department of Environmental Protection. These rules address issues regarding development impacting floodplains and the watercourses that create them. These rules include requirements related to stormwater discharges that are within the jurisdiction of the rules. The rules establish engineering and environmental standards for stormwater management.

Soil Erosion and Sediment Control Standards at N.J.A.C. 2:90 are implemented by the Department of Agriculture State Soil Conservation Committee and the Soil Conservation Districts. These standards deal with preventing and minimizing soil loss as a result of development activities. The standards are applicable to all activities which disturb more than 5,000 square feet of surface area. Each such project must have a certified soil erosion and sediment control plan which is consistent with these standards.

The Stormwater Discharge Permit Program is administered by the Department of Environmental Protection under the New Jersey Pollutant Discharge Elimination System (NJPDES) regulations at N.J.A.C. 7:14A and implemented by the Soil Conservation Districts. Under this program any construction activity which disturbs more than one acre is required to comply with the terms of the Construction General Permit developed by Department of Environmental Protection. Compliance is achieved based on certification of the Soil Erosion and Sediment Control Plan submitted pursuant to the Soil Erosion and Sediment Control Standards.

The Dam Safety Standards at N.J.A.C. 7:20 are implemented by the Department of Environmental Protection and address the requirements for the construction, repair or modification of dams.

The Freshwater Wetland Protection Act rules at N.J.A.C. 7:7A are implemented by the Department of Environmental Protection. These rules define the means of identifying wetlands and associated buffers and establish the permitting requirements for approval to disturb these areas. The rules include specific language regarding stormwater management which impacts freshwater wetlands.

Municipal Stormwater Regulations – Phase II Rules: This is a new program mandated by the Environmental Protection Agency in rules published in December 1999 at Section 402(p)(6) of the Federal Clean Water Act. The program regulates pollutants discharging from storm drain systems owned or

operated by local governments. Under this new program, municipalities (as well as some State, County and interstate transportation entities and large public complexes) are required to obtain NJPDES permits for stormwater discharges. These permits address stormwater quality issues related to new development, redevelopment and existing development. The new rules require the development of a stormwater program as well as implementation of certain specific requirements. This Stormwater Management Plan is intended to meet these new requirements. Compliance with this rule will be a key component of any municipal stormwater management plan.

Industrial Stormwater Regulations are implemented by the Department of Environmental Protection under the New Jersey Pollutant Discharge Elimination System regulations at N.J.A.C 7:14A. These rules require a permit be obtained for point and non-point source stormwater discharges from an industrial facility.

- **County**

Morris County regulates stormwater discharges which impact county roads and drainage systems through Section 600 of the County Ordinance (Appendix A). Through subdivision and site plan submittals, the management of stormwater must be provided in accordance with County standards and supplemented by performance criteria and guidelines in the Morris County Stormwater Management Technical Guide and NJDEP Best Management Practices Manual. However, the County standards shall not take precedence over any municipal stormwater control ordinance which regulates the design of the systems and facilities internal to the development site.

County Roads in the Township of Mount Olive include: Sand Shore Road, Budd Lake-Netcong Road, Mount Olive Road, Flanders Road, Main Road, North Road, Park Road, Flanders Bartley Road, Bartley Chester Road and Bartley Long Valley Road.

In addition, the County also assumes jurisdiction over any culvert over 24" in the Township of Mount Olive.

- **Municipal**

Mount Olive Code Section 400-74- Surface water management (Appendix B, Section 1). This section requires the submission of a plan for any new construction, which requires a building permit and/or all soil removal permits. This surface water management plan must include information on the site regarding significant features, location of existing surface water control devices, size of existing culverts and storm sewers, descriptions of site changes which may effect runoff, computations of the total runoff before and after land disturbance, and proposed surface water management measures.

This section of the Mount Olive Code establishes general principals for the surface water management plan. The code addresses the rate and volume of surface water runoff from the site after development, the total amount of impervious surface, concentration of flow, and vegetation disturbance. The Code establishes design standards and objectives for the development of the Plan. These include calculations for the runoff and controls, outfall design, structures and land treatment practices and water carrying structures and retention areas. Single-family residential dwellings are exempt from the requirements of this section. It is required that for single-family homes the house leaders be connected to an on site drywell, a township drainage facility or a township drainage way. This provision serves to assure that the runoff increases generated by the house will be managed to enhance groundwater levels through recharge.

Mount Olive Code Section 400-823 – Stream Corridor Buffers (Appendix B, Section 2). This section requires that all residential and non-residential subdivisions and all site plans shall provide for a 100-foot stream corridor buffer. The Code prohibits the placement of any building structure in the stream corridor or buffer. Septic systems are also prohibited in the corridor or buffer and may not be closer than 100 feet from the top of bank

The Section requires the submittal of certain information for any development with a stream corridor and buffer. This includes a demonstration of how erosion and soil stabilization measures, sediment traps and nutrient controls will be incorporated to protect the stream.

Mount Olive Code Section 400-48, Flood damage prevention (Appendix B, Section 3). This section of the Code applies to those areas within the jurisdiction of the Township of Mount Olive which are of special flood hazard as identified by FEMA as part of the National Flood Insurance Program. This section of the code provides detailed requirements for new construction in areas of special flood hazard. The code prohibits activities in floodways without a demonstration of no increase in flood levels.

Mount Olive Code Section 150, Littering (Appendix B, Section 4). This section prohibits littering and establishes violations and penalties for the offence.

Mount Olive Code Section 211, Recyclable Materials (Appendix B, Section 5). This section defines recyclable materials and establishes requirements for storage, collection and disposal.

Mount Olive Code, Section 106-8, Running at large; nuisances (Appendix B, Section 6). This section addresses pet waste and requires the collection and proper disposal of such waste. This section specifically prohibits the escape of such waste into the stormwater system.

Mount Olive Code Section 400-91, Residential Clusters (Appendix B, Section 7). This section sets forth the requirements for maintaining open space in cluster developments.

4.0 GOALS

This Municipal Stormwater Management Plan (Plan) has been developed to address the key issues of flooding, water pollution and public safety related to the impacts of stormwater in the Township of Mount Olive. This Plan conforms to all relevant Federal and State statutes and rules which address stormwater management, dam safety, water pollution and flood control. An additional goal of this Plan is to ensure it is consistent with any other Plans which deal with stormwater issues as well as with the goals and strategies of the State Development and Redevelopment Plan.

Stormwater Management

The specific goals of this Plan are listed below. These goals are consistent with the Department of Environmental Protection Draft Stormwater Management rules and will also serve to meet the overriding goals regarding flood control, water pollution control and public safety. The Implementation Section of this Plan provides the details of how each goal will be met.

1. Reduce flood damage, including damage to life and property.
2. Minimize stormwater runoff from new development projects where such runoff will increase flood damage.
3. Reduce soil erosion from any development or construction project.
4. Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures.
5. Induce water recharge into the ground where practical.
6. Prevent to the greatest extent feasible, an increase in nonpoint pollution.
7. Maintain the integrity of stream channels for their biological functions, as well as for drainage.
8. Minimize pollutant in stormwater runoff from new and existing developments in order 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.

9. Protect public safety through the proper design and operation of stormwater management basins.
10. Ensure adequate maintenance procedures have been established and implemented to ensure that the stormwater management measures fulfill their intended functions.

Other Rules

It is an objective of this Plan to be coordinated and consistent with any and all other relevant regulations. This Plan has been developed to ensure such consistency with all applicable rules including the Statewide Water Quality Management Planning rules, the Standards for Soil Erosion and Sediment Control in New Jersey, and the Flood Hazard Control Act Rules, the Dam Safety Rules and the Surface Water Quality Standards.

Other Stormwater Management Plans

The Stormwater Management rules require that all stormwater management plans and ordinances be coordinated with other Stormwater Management Plans. Per NJDEP, there are currently no other Stormwater Management Plans for any areas that impact the same river basin or drainage area. Thus there are no coordination issues to include or potential inconsistencies to address. This Stormwater Management Plan paves the way to complete a Regional Study that could potentially include those communities that could be impacted downstream and would include: town of Hackettstown, Washington Township, Netcong, Stanhope, Roxbury Township and Chester Township.

State Development and Redevelopment Plan

The Stormwater Management Rules require that all stormwater management plans take into consideration the goals, strategies and policies of the State Development and Redevelopment Plan. This Plan has been designed to achieve this. Mount Olive is located in the SDRP designated Planning Area 5, Environmentally Sensitive (Figure 1). The Township serves as a source of drinking water and includes areas of environmental sensitivity. The Township has addressed the State Development and Redevelopment Plan through zoning. Further this Plan includes numerous provisions which will serve to maintain the environmentally sensitive areas.

5.0 DATA

Certain data are key to the development, implementation and ongoing evaluation of a Municipal Stormwater Management Plan. The following data have been identified as central to the development of this Plan. The data have been analyzed

to determine necessary measures to achieve the goals of the Plan. In addition, where identified, data gaps have been noted.

Soils

Data on soil types and locations provide information regarding recharge and infiltration which are important aspects of stormwater management. The soil types found in the Township are discussed in this section. The exact locations are shown on the soil type map at Figure 2.

Soils formed in young glacial till are found in the northern portion of the Township. These soils are generally gravelly and extremely stony sandy loams underlain by glacial till that ranges from gravelly loamy sand to silt loam. Outcrops of bedrock are common in some steep slope areas. The soils are found on ridges and in valleys. The soils in this group located in the Township include:

- Rockaway-Hibernia-Urban Land associations. These are deep, well drained to somewhat poorly drained, gently sloping to steep gravelly sandy loams and stony to extremely stony loams and sandy loams that overlie granitic gneiss. These soils are found on uplands.
- Netcong-Rockaway outcrop association. These are deep, well drained and moderately well drained, gently sloping to very steep gravelly, very stony, and extremely stony sandy loams that overlie granite gneiss. These soils are found on uplands.

Soils formed in organic deposits, glacial lake sediment, or glacial outwash occur in the northern portion of the Township bordering Warren County and also north of Budd Lake. These soils are made up of wet organic soils, wet clayey soils, and wet or dry gravelly sandy loams. These soils are underlain by stratified glacial outwash or lacustrine sediment. These soils are found in basins, on low plains or on terraces. The soil type in this group found in the Township is:

- Riverhead-Urban Land-Pompton associations: These are deep, well drained to somewhat poorly drained, nearly level to strongly sloping gravelly sandy loams and sandy loams that overlie stratified outwash sand and gravel. These soils are found on open outwash plains and terraces.

Soils formed in old glacial deposits or in material weathered from bedrock are found in the southern half of the Township. These soils are predominately loamy and deeply weathered, and they have more clay in the subsoil than in the surface layer or in the substratum. The substratum is weathered residuum or old glacial deposits. These soils are found on uplands and in valleys. The soil types in this group located in the Township are:

- Parker-Edneyville associations. These soils are deep, excessively drained and well drained, steep to very steep, very gravelly sandy loams, gravelly loams, and extremely stony sandy loams that overlie granite gneiss. These soils are found on uplands.
- Bartley-Turbotville-Cokesbury association. These soils are deep, moderately well drained to poorly drained, nearly level to strongly sloping loams and gravelly loams that overlie limestone or granite gneiss. These soils are found on terraces.

Topography

Topography is important in determining stormwater management needs due to the impacts on stormwater runoff and recharge. The topography of Mount Olive varies. Located at the center of the Township is Budd Lake at an elevation of 930 feet. Throughout the rest of the Township are small hills and valleys. The steepest slopes are encountered along the northwestern edge of the Township leading down to the narrow floodplain of the Musconetcong River. Slopes up to 40% are quite common in the Township. Steep slopes (greater than 25%) are also encountered adjacent to the South Branch of the Raritan River, the lower stretch of Turkey Brook, along Route 206 and just north of Flanders. Moderate slopes are mostly located adjacent to the steep slopes in the northern part of the Township although they are also present throughout the central and southern parts of the Township.

Hydrology

The location and quality of surface and ground waters in the municipality is needed to assess the impacts of storm water runoff.

The Township is located within two major watersheds or drainage areas, the Delaware River and Raritan River watersheds (Figure 3). The major rivers located in the Township are the Musconetcong River which forms the northern and western sections of the Township and the South Branch of the Raritan River which originates in Budd Lake, flows southwesterly then easterly joining the North Branch in Raritan. Approximately 40% of the municipality drains to the Delaware River watershed. The total drainage area of the Raritan River Watershed is approximately 276 square miles. Approximately 60% of the Township drains to the Raritan River watershed. Other contributing streams to the Raritan Watershed in the Township include Drake's Brook, Conlon Pond Brook and Turkey Brook. The South Branch, which drains into the Raritan River Basin, is the receiving water for a large portion of the Township's runoff.

The Musconetcong River is the receiving water for approximately one third of all of the Township's surface water flow. The source of the River is Lake

Musconetcong. The River also encompasses approximately half of Lake Hopatcong to the north. The Hackettstown reservoir is also located in this system. This river ultimately drains into the Delaware River and the portion that runs through Mount Olive (or from Lake Hopatcong Dam to the Delaware River) is classified by the New Jersey Department of Environmental Protection as FW2-TM. These classified waters are protected for the maintenance of trout populations and propagation and maintenance of all other species inhabiting these waters. Existing uses in these waters are maintained and protected through the Surface Water Quality Standards.

There are eight (8) sub basins in Mount Olive within the two main watersheds identified above which are presented in Figure 4:

- **Raritan River Watershed Sub-Basins:** South Raritan, Drakes Brook, Conlon Pond Brook, Turkey Brook and Budd Lake.
- **Delaware River Watershed Sub-Basins:** Mine Brook, Musconetcong River and Wills Brook.

Budd Lake is the predominant hydrologic feature in the Township. Budd Lake is 376 acres of surface water area, 15.161 square kilometers of land area and 2218 acre feet of volume. Budd Lake is recharged by groundwater seepage from upland terminal moraine sands and gravels. This runoff enters the system through the series of wetlands in the north-central portions of the watershed and flows to Budd Lake. The Budd Lake watershed is drained by five streams. The drainage area of the lake is 4.7 square miles. The New Jersey Department of Environmental Protection has classified Budd Lake as FW2-NT (C1). Category One Waters shall be protected from any measurable changes to the existing water quality. Water quality characteristics that are generally worse than the water quality criteria, except due to natural conditions, shall be improved to maintain or provide for the designated uses where it can be accomplished without adverse impacts on organisms, community or ecosystem of concern.

Freshwater wetland areas are located throughout the Township (Figure 5). The largest area of wetland is that associated with Budd Lake located along the northern and northwest shore. This area is largely undeveloped and provides for flood storage, lake recharge and wildlife habitat. The northern section of the Township also has wetland areas that are closely associated with the Musconetcong River system as well as the southeastern tip associated with Drake's Brook.

Floodplains are located in the Township along Drake's Brook in the southern part of the Township, Budd Lake in the central part of the Township and the South Branch of the Raritan River and the Musconetcong River in the northern part of the Township and the western part of the Township by Hackettstown. These floodplains are depicted in Figure 6.

There are two (2) dams located within Mount Olive: Budd Lake Dam and Hackettstown Dam.

303 (d) Listed Waters

There are several impaired waterbodies listed on the 2002 EPA 303 (d) list which are located in the Township of Mount Olive. These waterbodies include the following:

- Musconetcong River at below Lake Musconetcong : Macroinvertebrates
- Manor House Outlet: Fecal Coliform
- Pax Amicus Beach: Fecal Coliform
- Pavillion Beach: Fecal Coliform
- Mount Olive Municipal Beach, Budd Lake: Fecal Coliform

Aquifer Recharge Areas

Mount Olive Township is underlain by both the Musconetcong River Aquifer Basin and the South Branch of the Raritan River Aquifer Basin. These aquifers are the principal source of drinking water for the Township of Mount Olive. Recharge is predominantly through precipitation that percolates down through the overlying soil. Aquifer recharge can be highly variable because it is determined by local precipitation and runoff. Both factors are influenced by topographic relief and the capacity of the land surface to accept infiltrating water.

NJGS has groundwater recharge rates for the Township of Mount Olive which indicates that recharge rates predominantly range from 12-23 inches/year (Figure 7). Due to the soils in the Township, it would appear that on more than 50% receives 19-23 inches recharge. Comparing this to other municipalities statewide, it appears that the overall average in the State receives less recharge at 18-20 inches/year.

Geology

The Township lies in the New Jersey Highlands. The geology of Mount Olive consists of a central area of Precambrian granite/gneiss bordered on the southeast and northwest by zones of Paleozoic sedimentary rocks. Glacial drift overlies the bedrock throughout the Township.

Land Use

Data regarding the extent and type of existing land use provides an overview of the stormwater runoff and control issues in the municipality.

About 38% or 8,322 acres of the Township is developed. Agriculture uses account for 14% of the Township's land. Preserved open space accounts for 16% and 27% is currently vacant land. The remaining 5% is taken up by lands not open for public use, as they have been purchased for their potential as a water supply source. Figure 8 depicts the land use/land cover of the Township of Mount Olive.

Public Lands

Stephens State Park and Allamuchy State Park are located within the Township in the northern and western portions respectively.

Population

Until 1960 the population of Mount Olive remained stable. The population increased by 173% during the period from 1960 to 1970. This population increase followed the completion of Interstate 80 and the subsequent development of eastern Morris County. During the 1980's the population doubled to over 20,000. By 1988 the population increased to 23,500. As of 2000 the population was 24,193. There are approximately 699 persons per square mile.

With the access to state highways such as Routes 46 and 206, the Township continues to grow. According to Morris 2000, Mount Olive is one of the fastest growing communities in Morris County and in the northern part of the state. It is projected that the population of Mount Olive will reach 26,626 by 2021.

Sanitary Sewer System and Septic Systems

Sewage treatment and disposal in the Township is accomplished by either individual subsurface disposal facilities or central sewage collection treatment and disposal facilities. Only a small portion of Mount Olive is currently sewered. These areas include: the Cloverhill service area in Flanders, the Budd Lake service area, the Wills Brook Interceptor area located near the International Trade Center that discharges to Musconetcong Sewerage Authority and the western portion of the Township that is within the Hackettstown Municipal Utilities Authority service area. The remainder of the Township is served by individual subsurface sewage disposal systems.

This Stormwater Management Plan will be incorporated into the Township's Wastewater Management Plan.

State Development and Redevelopment Plan (SDRP)

The Planning Area and center designation status for the Township need to be known in order to assess consistency with the SDRP as required for the Municipal Stormwater Management Plan.

Mount Olive is located entirely in the SDRP Planning Area 5 which is the Environmentally Sensitive Planning Area. There are no designated centers at this time. The Village of Budd Lake and Flanders Village are listed in the SDRP as identified centers, but to date there has been no formal designation.

Threatened and Endangered Species

The receipt of rare species information in Mount Olive Township has been received by the New Jersey Department of Environmental Protection Natural Heritage Program (Appendix C). If suitable habitat is present within the area of the Township, these species have the potential to be present. These species may include but are not limited to: the Wood Turtle, Bog Turtle, Barred Owl, Black Spruce Swamp and Swamp-Pink. It should be noted that the Natural Heritage Program cannot provide a definitive statement on the presence, absence or condition of biological elements within any part of New Jersey. Only site-specific comprehensive field investigations led by qualified individuals can determine the presence or absence of Rare Species and Natural Communities that have the potential to exist within the Township.

The Tranquility, Stanhope, Hackettstown and Chester USGS quad maps were used to red flag the general locations for documented occurrences of rare and endangered species located within three Natural Heritage Priority Sites identified as The Budd Lake Outlet, Budd Lake Bog and Bridge to Nowhere. These three sites have been identified to be located within or near the Township.

Natural Heritage Priority Sites represent some of the best remaining habitat for rare species and exemplary natural communities in the State of New Jersey. These areas should be considered to be top priorities for the preservation of these rare species and exemplary natural communities in the state. The Boundaries of each Natural Heritage Priority Site are drawn to encompass critical habitat for rare species or natural communities and their boundaries are often times extended to include additional buffer lands that should be managed to protect the habitat. Primary Bounds are used to refer to the boundaries enclosing critical habitat. Secondary Bounds are used to refer to the boundaries enclosing any additional buffer zones. The Nature Conservancy and the network of Natural Heritage Programs also rank each site according to its significance of biological diversity. The scale ranges from B1 to B5 with sites ranked B1-B3 generally being of global significance and sites ranked B4-B5 being of state significance.

The first Natural Heritage Priority Site located within the area of the Mount Olive Wastewater Management Plan is identified as the Budd Lake Bog, located along the northwest shore of Budd Lake and extending approximately one and a half (1.5) miles to the north. The site is an open canopy of swamp created by the last advance and subsequent recession of the Wisconsin Glaciation. It is surrounded by an oak-dominated upland forest that was created by glacial till. The swamp

contains muck soils with a canopy of Acer/Picea/Larix along with a very dense layer of Vaccinium corymbosum, Rhododendron viscosum and other species. There are several large hummocks supporting scattered trees and a closed shrub layer. The site has a Biodiversity Rank of B3 and contains the northern most stand of the federally threatened plant species known as black spruce swamp along with a number of other state rare and endangered plant species. The Primary Boundary of the site includes the hydrologically connected wetlands and upland buffer needed to prevent direct impacts. The Secondary Boundary includes additional buffers extending to the roads, developed areas or the watershed divide.

The second Natural Heritage Priority Site is Known as the Budd Lake Outlet and can be found near the southern tip of Budd Lake and extending approximately one-fifth (1/5) of a mile to the west. The site is a boggy section of woods located along the Budd Lake outlet stream and associated roadside ditch. The site has a Biodiversity Rank of B5 and includes wetland habitat for rare and endangered plant species.

The Final Natural Heritage Priority Site can be found starting at the northern most point of the Mount Olive Wastewater Management Plan and extending approximately one and a half (1.5) to the southeast along the Musconetcong River. The site bisects the river and extends approximately one quarter (1/4) of a mile in both directions into Mount Olive Township and the Borough of Stanhope, Sussex County. The site contains alluvial woods, wet woods and rich wooded uplands along the river and abandoned canal. The site has a Biodiversity Rank of B4 and includes the habitat for one state listed endangered plant species plus three special concern plant species.

Critical habitats will be protected by avoiding stormwater outfalls and enforcing stream corridor buffers in these areas.

6.0 IMPLEMENTATION AND EVALUATION

The goals of this Municipal Stormwater Management Plan (Plan) have been established as detailed in Section 4.0. The means of achieving each goal are provided below. Overall this Plan relies on the existing regulatory framework as the basis for the management of stormwater. These regulatory requirements and the technical guidance documents on which they are based have been incorporated into this Plan. The Mount Olive Stormwater Ordinance further strengthens the reliance on these technical specifications and provides the means for insuring implementation and ongoing evaluation.

Goal: Reduce flood damage, including damage to life and property.

The existing Mount Olive Code adequately addresses issues related to flood damage. Section 400-48 applies to the special flood hazard areas and includes

new construction requirements to address flood issues. This section of the Code also includes prohibitions on activities in floodways. This section is consistent with the requirements of the Federal Emergency Management Agency.

Further protections from flood damage are provided as new construction is required to comply with state regulations, specifically the Flood Hazard Rules and the Dam Safety rules, which address flood control. The Residential Site Improvement Standards also include provisions intended to address flood control, assuring all residential development will be designed to address these concerns.

Goal: Minimize stormwater runoff from new development projects where such runoff will increase flood damage.

As noted above the existing Mount Olive Code at section 400-48 as well as the applicable State regulations provide certain protections from flood damage.

Implementation of the Standards for Soil Erosion and Sediment Control provide additional protection from flood damage due to stormwater runoff. These standards are designed to primarily address soil erosion and sediment control. The standards, when implemented, will also have a positive impact on flooding. All stormwater management facilities in Mount Olive which disturb five or more acres will be designed and constructed in conformance with these standards.

The Residential Site Improvement Standards include specific requirements for residential development designed to address both on site and downstream flooding. All applicable, new residential construction in Mount Olive will be designed and constructed in accordance with these rules.

Implementation of the Stormwater Management Rules design standards dealing with stormwater quantity will provide additional protection from flood damage. As detailed in these rules, Mount Olive will adopt an ordinance requiring incorporation of non-structural and structural stormwater control measures as a prerequisite for local approval. This Ordinance is attached (Appendix D). This ordinance also includes requirements for the long-term maintenance of all stormwater management measures further ensuring their efficiency into the future.

Mount Olive's Stormwater Management Ordinance also includes the Stormwater Management Rule requirements for infiltration and groundwater recharge. These requirements for all new construction will directly reduce flooding concerns.

The Mount Olive Code Section 400-91 - Residential Clusters provides specific standards for the creation, design and maintenance of open space when residential cluster developments are approved. The encouragement of clustering with specific requirements for open space will contribute to the overall goal of minimizing stormwater runoff and the associated flood damage. The new zoning requirements for the Township allow for a new zoning district, RR-A, with low

density residential objectives and a variety of planned development techniques including cluster development to enable environmentally sensitive areas to be preserved and protected. The R-2 district also allows for cluster development in order to encourage more efficient development patterns and to preserve environmentally sensitive areas.

Goal: Reduce soil erosion from any development or construction project

Compliance with the Soil Erosion and Sediment Control Standards will serve as the primary route for reducing soil erosion. For residential development compliance with the RSIS will further minimize any soil erosion. New construction which disturbs more than one acre is also required to obtain a NJPDES Construction Permit. This permit is issued by the Soil Conservation Districts and requires compliance with the Soil Erosion and Sediment Control Standards.

Goal: Assure the adequacy of existing and proposed culverts and bridges, and other in stream structures

Since the Township does not currently have an infrastructure map illustrating existing bridges and culverts, a survey to determine the adequacy of these facilities could not be completed. However, the Township will devise a schedule to stencil existing stormwater infrastructure in accordance with available funding sources.

For proposed culverts, bridges and other in stream structures there are existing regulatory requirements. The RSIS provide detailed design specifications for culverts. Thus all new residential development in Mount Olive will be compliant with this goal. The Soil Erosion and Sediment Control Standards address in stream structures and temporary bridges assuring all new development will achieve this goal. Finally, the Flood Hazard rules require a permit for most in stream disturbances. These rules establish specific engineering standards for all structures located in flood hazard areas. These standards will assure the adequacy of all such proposed structures.

The Mount Olive Code at Section 400-74 Surface Water Management includes design standards for outfalls and water carrying structures. Implementation of this Ordinance will further reinforce compliance with this goal.

Goal: Induce water recharge into the ground wherever practical

The Mount Olive Stormwater Ordinance includes the infiltration and ground water recharge requirements of the Stormwater Management Regulations. These requirements will be applied to all new development.

The Mount Olive Stormwater Ordinance includes the general standards requiring incorporation of non-structural stormwater management measures. These measures which include minimizing impervious cover and site disturbance will contribute to meeting this goal.

The Mount Olive Code at Section 400-74 Surface Water Management requires that for all residential construction house leaders must be connected into an on-site dry well, ad township drainage facility or a township drainageway. This will serve to induce water recharge.

For existing development a public education plan including information on landscaping which would enhance recharge is planned.

Goal: Prevent to the greatest extent feasible, a no net increase in nonpoint source pollution.

The water quality design standards of the Stormwater Management Regulations have been incorporated into the Mount Olive Stormwater Ordinance. These standards will serve as the primary vehicle for minimizing nonpoint pollution from all new development.

The design standards for residential construction included in the RSIS will supplement the Ordinance.

The Soil Erosion and Sediment Control Standards will serve to minimize erosion and sediment during construction minimizing nonpoint pollution leaving the construction site.

The Mount Olive Code at Sections 106-8, 150 and 211 address pet waste, litter and waste disposal. These sections ensure pollutant from these sources do not enter the stormwater. The Public Education and Outreach program will include general information on stormwater runoff, fertilizer and pesticide use, and waste disposal further enforcing these issues.

Geese droppings represent a significant source of nonpoint pollution. Geese populations in the vicinity of Budd Lake need to be managed to control this pollution. The Township will utilize the New Jersey Department of Environmental Protection Guide to management of Canada Gees in Suburban Areas to develop a management plan.

Goal: Maintain the integrity of stream channels for their biological functions, as well as for drainage.

The Mount Olive Code Section 400-823 requires 100-foot stream corridor buffers for all new development. This buffer requirement will minimize stream channel disturbance.

Implementation of the Stormwater Management Rules will further provide protection to the stream corridor by minimizing the volume and rate of stormwater entering the stream.

The Residential Site Improvement Standards will provide protection from stream channel impact due to new residential construction.

The Soil Erosion and Sediment Control Standards will provide the necessary protection during construction. Compliance with these rules will also enhance the long term functioning of the stream.

The Flood Hazard Rules provide additional protection to stream corridors. These rules provide for mandatory buffers and regulate the volume and rate of stormwater runoff.

Goal: Minimize pollutants in stormwater runoff from new and existing developments in order 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.

The Stormwater Management rules include specific design and performance standards for improving water quality by requiring the control of total suspended solids and nutrient loads. These water quality design standards have been included in the Mount Olive Stormwater Ordinance.

The Soil Erosion and Sediment Control Standards provide for the control of pollutants leaving the site during construction.

The Municipal Stormwater Regulation Program rules provide for inclusion of Best Management Practices to minimize pollutants entering stormwater from new and existing development. The Mount Olive Stormwater Ordinance incorporates the required elements of this program including requirements of various sources of waste control and a strong public education and outreach program. The public education and outreach programs will address specific ways homeowners can have a positive impact on controlling pollutants which may enter the stormwater system. The existing Mount Olive Code includes sections dealing with control of pet waste, litter and illicit discharges to the storm sewer.

Geese droppings represent a significant source of non point pollution. Geese populations in the vicinity of Budd Lake need to be managed to control this pollution. The Township will utilize the New Jersey Department of Environmental Protection Guide to management of Canada Gees in Suburban Areas to develop a management plan.

Goal: Protect public safety through the proper design and operation of stormwater management basins.

The design and operation requirements established to ensure safety in the Stormwater Management Rules have been incorporated into the Mount Olive Stormwater Management Ordinance for all new basins.

Goal: Ensure adequate maintenance procedures have been established and implemented to ensure that the stormwater management measures fulfill their intended functions.

The Stormwater Management Rules include specific requirements regarding maintenance procedures. The Mount Olive Stormwater Ordinance incorporates these requirements. Maintenance plans will be required for all stormwater management measures. These plans will provide the necessary detail to ensure that the stormwater measures will function as designed will protect public safety and will demand minimal maintenance. The plan will provide specifics with regard to the maintenance tasks and schedules, cost estimates, and the identification of those responsible for maintenance. The Mount Olive Stormwater Ordinance requires that the project design engineer prepare the plan with all site-specific requirements.

For residential construction the RSIS design requirements will serve to ensure the stormwater management measures will be strong, durable and corrosion resistant as required by the Stormwater Management rules.

The Township of Mount Olive Department of Public Works periodically performs stormwater management maintenance measures with assistance from the Parks Department. Responsibility for maintenance shall remain with the property owner unless the property owner enters into agreement with the Township to ensure long term maintenance

Goal: Consistency with Phase II rules.

The requirements of the Municipal Stormwater Regulations have been incorporated into the Stormwater Management Plan. This Plan has been developed to address new development, redevelopment and existing development as required by the Municipal Stormwater Regulations. Each of the mandatory requirements of these rules has been addressed, as have some of the additional measures.

Goal: Consistency with other relevant rules.

This Stormwater Management Plan has been developed to ensure consistency with all applicable state and local requirements. All regulatory requirements associated with stormwater management have been incorporated.

Goal: Consistency with Stormwater Management Plans.

A review of neighboring municipalities and counties has revealed that there are no existing stormwater management plans. Upon final review and approval by the Department of Environmental Protection Mount Olive will distribute this plan to all neighboring municipalities and to the County. All future revisions will also be made available to these entities.

Goal: Consistency with the State Development and Redevelopment Plan.

The Township has addressed consistency with the State Development and Redevelopment Plan through zoning changes (see Appendix E). These changes will ensure that future development is consistent with the goals of the SDRP to maintain this area as a Planning Area 5, an Environmentally Sensitive area. The stormwater management provisions of this Plan will further ensure that future development has minimal environmental impact.

Evaluation

To ensure this Plan is effective in meeting these goals an ongoing process to evaluate the Plan will be implemented. This evaluation process will include both an assessment of the workability of the Plan as well as the impact on the stormwater issues. Each goal will be evaluated to determine the degree of compliance. Where additional actions are deemed necessary they will be identified and taken. The Plan will be evaluated every 5 years.

Costs for Implementation and Evaluation of Plan

The costs to implement and evaluate this Stormwater Management Plan is based on implementing the following tasks:

1. Complete infrastructure mapping and stenciling: \$50,000
2. Incorporate Phase II Municipal Stormwater Rules in Ordinance: \$1500
3. Develop a Public Education and Outreach program: \$5,000
4. Develop a program to investigate illicit connections and incorporate same into Ordinance: To be determined
5. Adopt Stormwater Control Ordinance: \$1,500
6. Investigate need for programs to meet the pollutant minimization requirements of the Municipal Stormwater Rules (street sweeping, inlet

- retrofitting, stormwater facility maintenance, road erosion, control maintenance, outfall pipe remediation): \$5,000
7. Develop and implement pollutant minimization programs: to be determined
 8. Investigate need for maintenance yard operation upgrades as outlined in Municipal Stormwater Management Rules: \$45,000
 9. Develop and implement programs for maintenance yard operation upgrades: to be determined

Mapping and stenciling will be required under the Phase II Rules. However, the Township will rely on available funding to complete this.

7.0 DESIGN AND PERFORMANCE STANDARDS

New Development

The Stormwater Management Regulations set forth specific design and performance standards for stormwater management measures. These standards have been incorporated by reference in the Mount Olive Stormwater Management Ordinance. These standards apply to new development which is shown on any site plan or subdivision plan and which includes the disturbance of one or more acres of land. These standards address stormwater quantity and quality issues associated with this new development. Consistent with the Stormwater Management rules, the Mount Olive Stormwater Ordinance requires that nonstructural stormwater management measures be considered and used first. Where such measures do not meet the established design and performance standards, structural measures are then to be incorporated. Finally, for any stormwater measures, a maintenance plan must be included in the design.

Applicants may rely on various technical guidance documents to achieve the design and performance standards. Consistent with the Stormwater Management rules the following technical resources will be acceptable:

- New Jersey Stormwater Best Management Practices Manual
- New Jersey Department of Environmental Protection Stormwater Management Facilities Manual
- Standards for Soil Erosion and Sediment Control in New Jersey

Non-structural measures to be considered shall include site design and preventive source controls. To confirm the effectiveness of such measures applicants must verify the control of stormwater quantify impacts as detailed in the Stormwater Management rules. The tests of assuring control of the quantity impacts as detailed in these rules have been incorporated into the Mount Olive Stormwater Ordinance.

The general standards for structural measures are specified in the Stormwater Management rules and have been incorporated into the Mount Olive Ordinance. These measures shall be incorporated as needed to meet the soil erosion, infiltration and runoff quantity standards included in the Mount Olive Stormwater Ordinance.

The design standards for the specific structural stormwater management measures are those included in the New Jersey Stormwater Best Management Practices Manual. Other designs or practices may be used if they are approved by the Soil Conservation District.

The design and construction of such facilities must comply with the Soil Erosion and Sediment Control Standards as well as any other applicable state regulation including the Freshwater Wetland Protection Act rules, the Flood Hazard Control rules, the Surface Water Quality Standards and the Dam Safety rules. The requirement to be consistent with all other applicable rules has been included in the Mount Olive Stormwater Ordinance.

Stormwater runoff quality controls for total suspended solids and nutrient load shall meet the design and performance standards as specified in the Stormwater Management Rules. These standards have been incorporated into the Mount Olive Stormwater Ordinance.

The minimum design and performance standards for infiltration and groundwater recharge specified in the Stormwater Management rules have been incorporated into the Mount Olive Stormwater Ordinance and must be met for all applicable development. Consistent with the Stormwater Management Rules, the Ordinance allows for an exemption from this requirement where the applicant can demonstrate that it is not practicable to meet the standards but has taken all possible steps to meet all stormwater management measures.

The means for calculating stormwater runoff are specified in the Stormwater Management rules. These methods have been included in the Mount Olive Stormwater Ordinance.

Maintenance

Structural stormwater management measures shall be designed to minimize maintenance and to facilitate any maintenance which may be necessary. Such structures shall be designed, constructed and installed to meet this requirement. A maintenance plan is required. This will ensure that the stormwater management measures function as designed. The details of the maintenance plan are included in the Stormwater Management Rule and will be incorporated into the Mount Olive Stormwater Ordinance.

The Township shall prepare a Maintenance Plan to ensure that the stormwater management measures incorporated into the design of new major development projects fulfill the intended stormwater quality and quantity control functions, to prevent any threat to public safety or health and to minimize long term maintenance costs. The Maintenance Plan shall consist of specific preventative maintenance tasks and schedules. The Maintenance Plan will identify an agency, homeowner's association or developer as having maintenance responsibility for the stormwater facility.

Where the Township assumes maintenance responsibility, preventative maintenance shall be performed on a regular basis and will be appropriate for the particular structural management measure being implemented. These maintenance measures shall be in accordance with N.J.A.C 7:8-5 and may include: periodic inspections, vegetation management, sediment, debris and trash removal and mosquito control. Corrective maintenance shall be performed on an as needed basis for structure repairs or replacements, removal of outlet and pipe blockages, erosion restoration, snow and ice removal etc. The person or persons responsible for maintenance shall keep a detailed log of all preventative and corrective maintenance for the structural management measures incorporated into the design of the development, including a record of all inspections and work orders.

Day to day maintenance of structural stormwater facilities shall be the responsibility of the owner. Where such facilities are an integral part of the public drainage system then the municipality shall assume responsibility for the maintenance and repair. Where certain measures are privately owned, a formal request shall be made to the Department of Public Works of Mount Olive Township requesting it assume maintenance responsibility. In such instances maintenance easements, personal guarantees, deed restrictions or other legal mechanisms may be needed. In those instances where maintenance is to be a private responsibility, the responsible party will submit quarterly reports to the municipality documenting all maintenance and repair activities which have taken place and verifying conformance with the maintenance plan.

All maintenance activities are to be done in conformance with any other applicable rules. This requirement will be incorporated into the Mount Olive Stormwater Ordinance.

The Township shall evaluate the Maintenance Plan at least once per year

Appendix A contains an Operation & Maintenance Plan to be used as guidance for the Township of Mount Olive.

Monitoring

The maintenance plan shall provide for a program of water quality monitoring and reporting to measure the effectiveness of the Stormwater Management Plan in achieving, to the extent possible, a no net increase in pollutants. Where monitoring demonstrates that implementation of the Plan has not achieved results anticipated, a new provision for review and revision of the Plan will be included. Responsibility for compliance will remain with the property owner unless the property owner enters into agreement with the Township to assume responsibility.

Safety

All stormwater management basins must be designed and operated in accordance with the requirements of the Stormwater Management rules. The specific safety requirements including in these rules have been included in the Mount Olive Stormwater Ordinance. Presently, the Township requires fencing around basins on a case by case basis dependent upon safety concerns associated with the location and slopes of the basin.

Coordination with Other Agencies

The design and performance standards in the RSIS apply in addition to the Stormwater Management Regulations where applicable.

Soil Erosion and Sediment Control Standards serve as the minimum design and performance standards for erosion control.

As detailed above the Mount Olive Ordinance includes repeated provisions requiring consistency with any and all other regulatory programs which are applicable.

Morris County has reviewed this SWMP for consistency with County stormwater requirements and to provide technical assistance as appropriate.

This Stormwater Management Plan has also been reviewed by Morris County Soil Conservation District for consistency.

Existing Development

The Mount Olive Stormwater Ordinance has been developed to include those provisions of the Municipal Stormwater Regulations which apply to existing development. This includes the development of a Stormwater Pollution Prevention Plan (SPPP) and the implementation of certain Best Management Practices.

The Stormwater Pollution Prevention Plan includes the following required elements called Statewide Basis Requirements.

Local Public Education and Outreach: The SPPP will include the details of this effort which will be designed to reach as many of the township residents as possible using various tools. The goal is to provide information regarding how the residents can have a positive impact and help deal with municipal stormwater related problems. Outreach will be conducted using various means including newspapers, mailings, public meetings, and presentations to various groups including schools. To encourage public involvement there will be a formal public notice regarding the development of this public education and outreach program. To assist in the successful implementation of the Mount Olive Stormwater Management Plan the public will be asked to provide input.

Stormsewer stenciling has been found to be a low cost means of increasing awareness regarding storm sewer discharges. All storm sewers in Mount Olive will be stenciled to indicate that the sewer discharges to a waterway. Reliance on local groups to implement this project will help to improve the intended impact. Mount Olive will solicit suggestions and volunteers from the public regarding how to implement this program.

An additional education component will focus on landscaping. Education regarding fertilizer and pesticide use will help minimize the non-point pollution loads from existing lawns. Education will focus on non-traditional approaches to lawn and garden maintenance as well as proper application techniques. Information on low maintenance landscaping will also be provided.

Improper disposal of waste can also have a negative impact on stormwater. Pollutants from such common items as motor oil, paints, solvents and cleaners can find their way into storm drains or enter the stormwater system due to improper disposal on the ground. Public education can minimize this problem.

Going beyond public education Mount Olive will take additional steps to address stormwater issues associated with existing development. With regard to minimizing the impacts of improper disposal of waste several actions will be taken.

A program to identify and eliminate any illicit connections to the municipal storm sewer system will be developed and implemented. Further, upon receiving final guidance from the Department of Environmental Protection with regard to this issue the Mount Olive Stormwater Ordinance will be revised to prohibit these illicit connection and to establish enforcement procedures to be taken upon finding such connections. As part of this effort a municipal wide mapping of all outfall pipes that discharge to surface water will be conducted.

Pet waste is another waste disposal problem which impacts stormwater quality. The Mount Olive Code at Section 106-8 requires that pet waste be picked up and properly disposed of. The Code specifically states that such waste shall not be allowed to escape into a storm sewer. This Section of the Mount Olive Code has been incorporated into the Mount Olive Stormwater Ordinance by reference. A public education campaign will be implemented to support this regulatory approach.

Litter also impact stormwater runoff. The Mount Olive Code at Section 150 addresses littering. This Litter Ordinance of the Township of Mount Olive establishes that littering is unlawful and includes penalties for violation of the Ordinance. This Ordinance is referenced in the Mount Olive Stormwater Ordinance. Public education will be provided to reinforce the importance of properly disposing of waste.

Lawn waste is another source of stormwater contamination. To minimize this impact the Mount Olive Code at Section 211 establishes that yard waste and stumps, logs and tree parts are recyclable items and has established specific schedules for pick up of these items. Further the Ordinance requires that yard waste, with the exception of grass clippings, be placed in paper bags or a clean container. The Township does not collect yard waste resulting from lawn mowing. The ordinance requires that this waste may be left on the property, composted, delivered to an approved composting or disposal facility or bagged in special bags provided at a cost by the Township and left for pickup. These requirements have been included in the Mount Olive Stormwater Ordinance by reference. In addition public education will be provided to reinforce the importance of the proper handling of this waste.

8.0 MOUNT OLIVE CODE

Stormwater Management

- **Statutory Authority:** The Stormwater Management Act, P.L., c. 32, which amends and supplements the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq, and N.J.S.A. 40:55D-93 et seq, authorizes municipalities to revise stormwater control ordinances as needed.
- **Statement of Purpose:** It is the purpose of this section to establish standards and regulations for the management and discharge of stormwater runoff, to promote public safety and to minimize the adverse stormwater quantity and quality impacts of existing and new land development by provisions designed to:
 1. Reduce flood damage, including damage to life and property.

2. Minimize stormwater runoff from new development projects where such runoff will increase flood damage.
3. Reduce soil erosion from any development or construction project.
4. Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures.
5. Induce water recharge into the ground where practical.
6. Prevent to the greatest extent feasible, an increase in nonpoint pollution.
7. Maintain the integrity of stream channels for their biological functions, as well as for drainage.
8. Minimize pollutant in stormwater runoff from new and existing developments in order 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.
5. Protect public safety through the proper design and operation of stormwater management basins.
6. Ensure adequate maintenance procedures have been established and implemented to ensure that the stormwater management measures fulfill their intended functions.

Applicability

Subdivision site plan or variance approvals

Compatibility With Other Permit and Ordinance Requirements

Development approvals issued pursuant to the Ordinance do not relieve the applicant of the responsibility to secure all other required permits and approvals.

Design Standards

In developing the flood control and pollutant reduction stormwater management measures, non-structural measures including source controls and site planning should be explored and incorporated first.

Where these measures are found to not meet standards established in the Stormwater Management Rules at N.J.A.C. 7:8, structural stormwater management measures are to be incorporated into the design.

Where it is not feasible for engineering, environmental or financial reasons to construct according to these standards, the design engineer shall provide justifications.

Non-structural stormwater management measures, both site design and preventive source control, shall meet the goals and standards established in the Stormwater Management Rules.

The assumptions and factors to be used for making stormwater runoff calculations are those specified in the Stormwater Management rules.

The design and performance standards for infiltration and groundwater recharge are those established in the Stormwater Management rules. Non-structural methods can be used to meet the stormwater quantity requirements provided that the impact of the proposed control can be calculated and demonstrated as specified in the Stormwater management Rule. Any are used in the calculations, as non-structural measures shall be deemed restricted to maintain the measures.

The design and performance standards for stormwater runoff quality controls are those specified in the Stormwater Management Rules. The pollutants of concern are Total Suspended Solids and nutrient load.

Schedule

The Township shall adopt the Stormwater Management Plan as an integral part of its Master Plan by the time the next re-examination of the Master Plan is due.

Within one (1) year after the Stormwater Management Plan is adopted, the Township will adopt a Stormwater Control Ordinance to implement the Plan. At such time, the adopted Plan and ordinances will be submitted to Morris County for review and approval. The effective date of the Plan will be after the County approves the Plan and formally advises the Township of same.

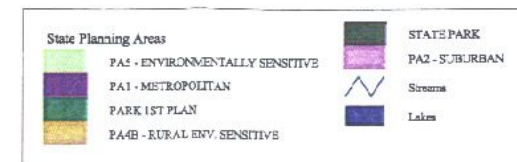
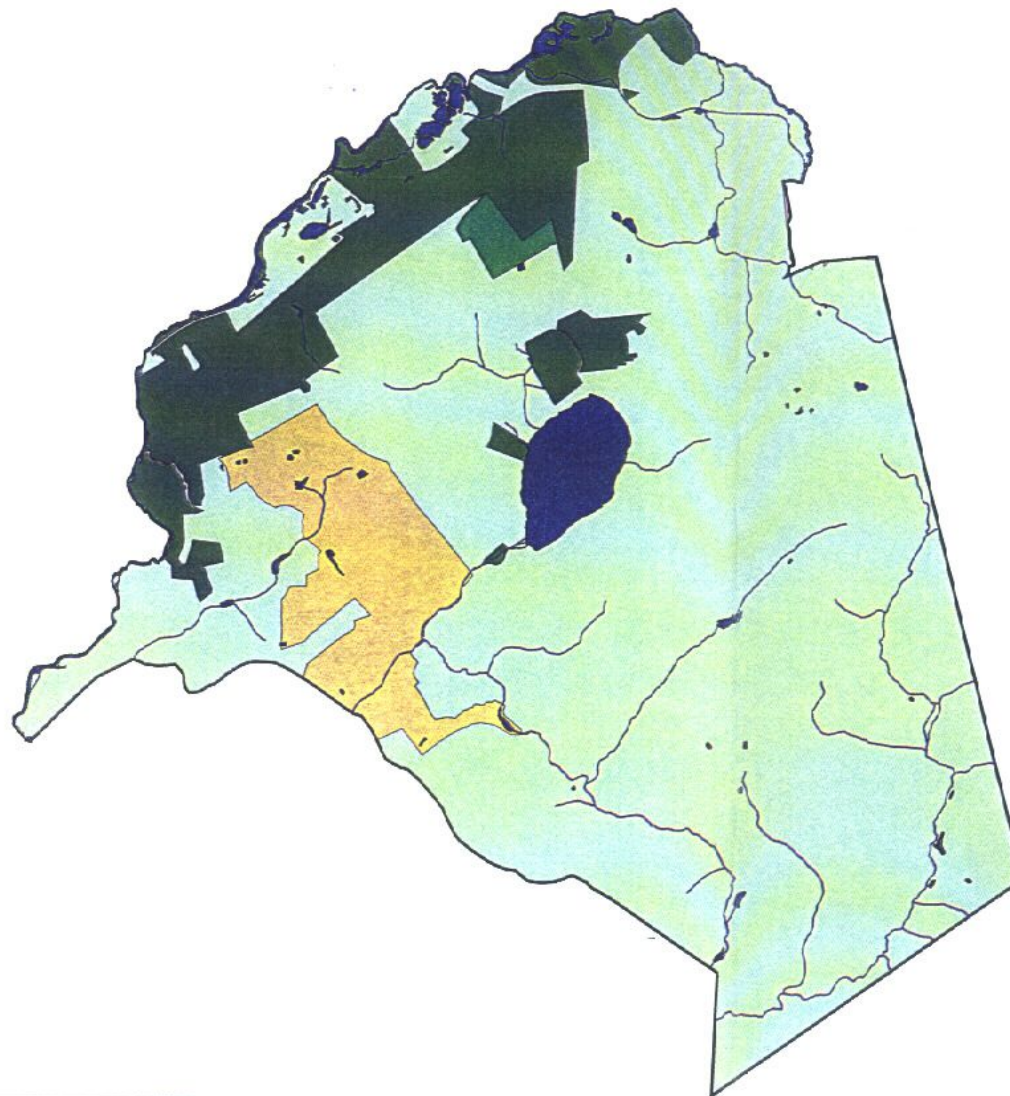


FIGURE 1: PLANNING AREAS OF THE STATE DEVELOPMENT AND REDEVELOPMENT PLAN FOR MOUNT OLIVE TOWNSHIP. ENVIRONMENTAL FEATURES DERIVED FROM THE NEW JERSEY OFFICE OF STATE PLANNING GIS COVERAGES.

4000 0 4000 8000 Feet

STATE PLANNING AREAS

MOUNT OLIVE TOWNSHIP

STORMWATER MANAGEMENT PLAN

MT. OLIVE TOWNSHIP MORRIS COUNTY NEW JERSEY

PROJECT NUMBER:
SJS416

DATE:
AUGUST 2002

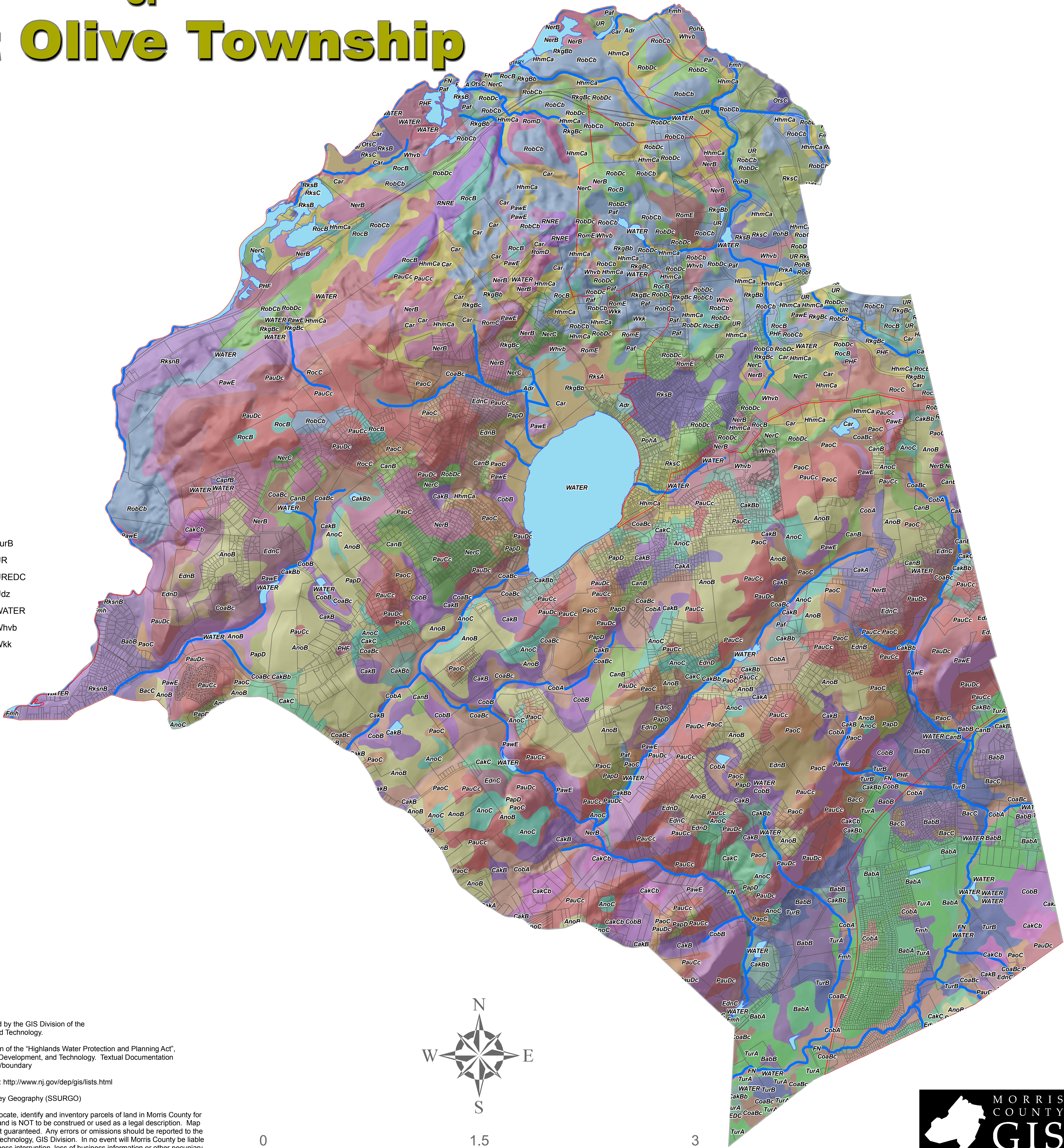
DRAWN BY:
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SCHOOR DEPALMA
Engineers and Design Professionals

USGS Soil Survey of Mount Olive Township

- Soil Types**
- | | | |
|-------|-------|-------|
| Adr | OtsC | TurB |
| AnoB | PHF | UR |
| AnoC | Paf | URED |
| BabA | PaoC | Udz |
| BabB | PapD | WATER |
| BacC | PauCc | Whvb |
| CakA | PauDc | Wkk |
| CakB | PawE | |
| CakBb | PohA | |
| CakC | PohB | |
| CakCb | PrkA | |
| CanB | RNRE | |
| CapfB | RkgBb | |
| Car | RkgBc | |
| CoaBc | RksA | |
| CobA | RksB | |
| CobB | RksC | |
| EdnB | RksnB | |
| EdnC | RobCb | |
| EdnD | RobDc | |
| FN | RocB | |
| Fmh | RocC | |
| HhmCa | RomC | |
| NerB | RomD | |
| NerC | RomE | |
| | TurA | |



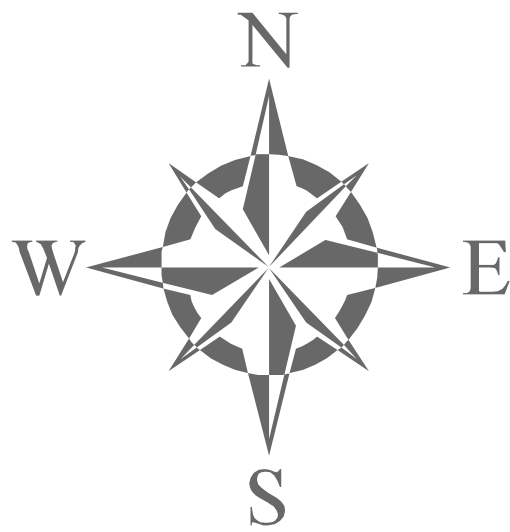
Source:
The parcel and municipal boundary layers were produced by the GIS Division of the Morris County Department of Planning, Development, and Technology.

The highlands preservation area is a digital representation of the "Highlands Water Protection and Planning Act", produced by the Morris County Department of Planning, Development, and Technology. Textual Documentation can be obtained at: bsmith.org/preserving_the_highlands/boundary

The water layers were obtained from the NJDEP website: <http://www.nj.gov/dep/gis/lists.html>

Soils Information was obtained from the USGS Soil Survey Geography (SSURGO)

The parcel information contained on this map is used to locate, identify and inventory parcels of land in Morris County for deliberative, advisory, and consultative purposes ONLY, and is NOT to be construed or used as a legal description. Map information is believed to be accurate, but accuracy is not guaranteed. Any errors or omissions should be reported to the Morris County Department of Planning, Development & Technology, GIS Division. In no event will Morris County be liable for any damages, including loss of data, lost profits, business interruption, loss of business information or other pecuniary loss that might arise from the use of this map or the information it contains.



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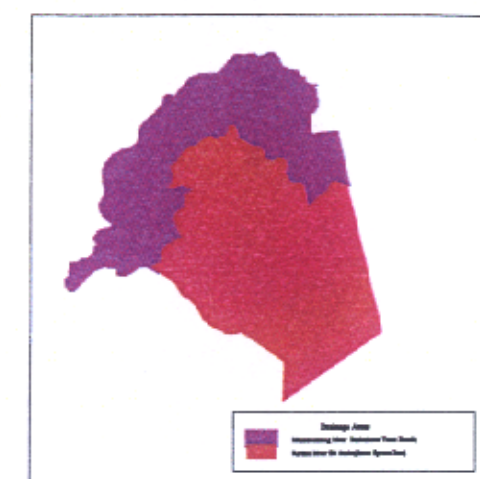
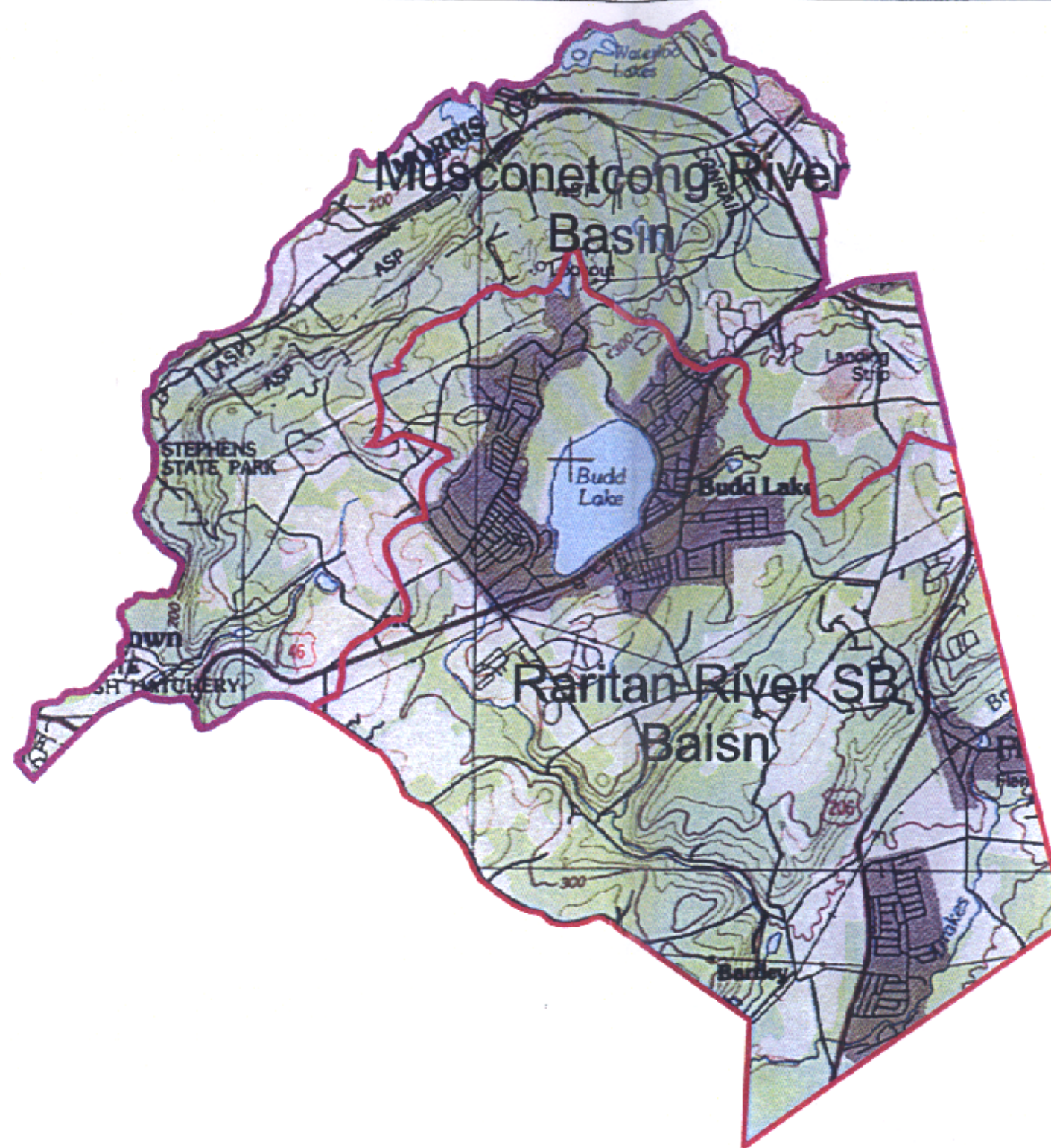


FIGURE 3: APPROXIMATE SITE LOCATION OUTLINED ON A USGS 7.5 MINUTE QUAD MAP. ENVIRONMENTAL FEATURES DERIVED FROM THE NJDEP GIS COVERAGES.

6000 0 6000 Feet

MAJOR DRAINAGE AREAS

MOUNT OLIVE TOWNSHIP

STORMWATER MANAGEMENT PLAN

MT. OLIVE TOWNSHIP MORRIS COUNTY NEW JERSEY

PROJECT NUMBER:
SJS416

DATE:
AUGUST 2002

DRAWN BY:
SES



SCHOOR DEPALMA
Engineers and Design Professionals

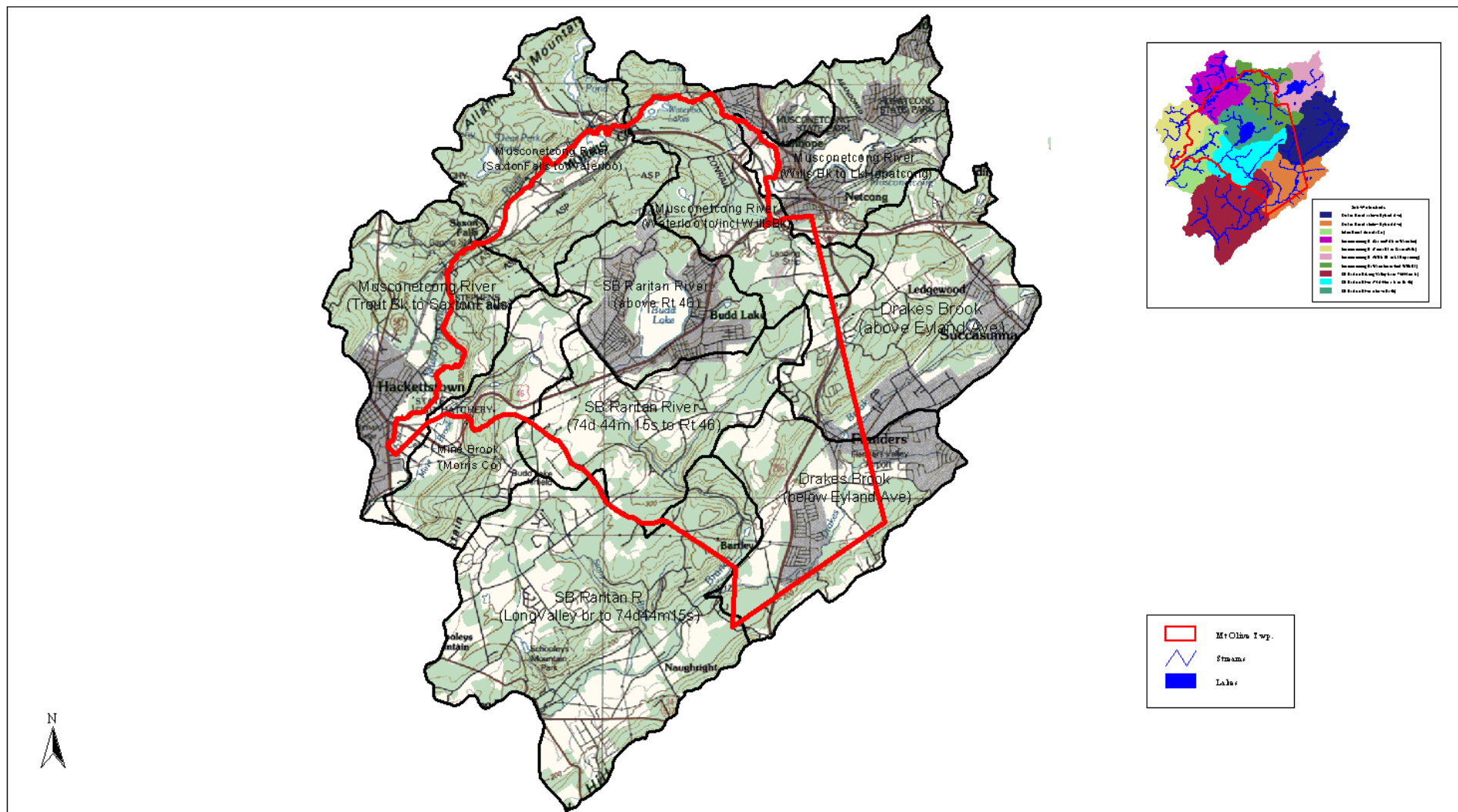


FIGURE 4: SUB-WATERSHEDS IN THE VICINITY OF MOUNT OLIVE TOWNSHIP OUTLINED ON A USGS 7.5 MINUTE QUAD MAP. ENVIRONMENTAL FEATURES DERIVED FROM THE NJDEP GIS COVERAGES.

10000 0 10000 Feet

SUB-WATERSHED REGIONS **MOUNT OLIVE TOWNSHIP** **STORMWATER MANAGEMENT PLAN**

MT. OLIVE TOWNSHIP MORRIS COUNTY NEW JERSEY

PROJECT NUMBER: SJS416	DATE: AUGUST 2002
DRAWN BY: SES	



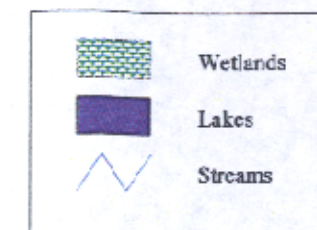
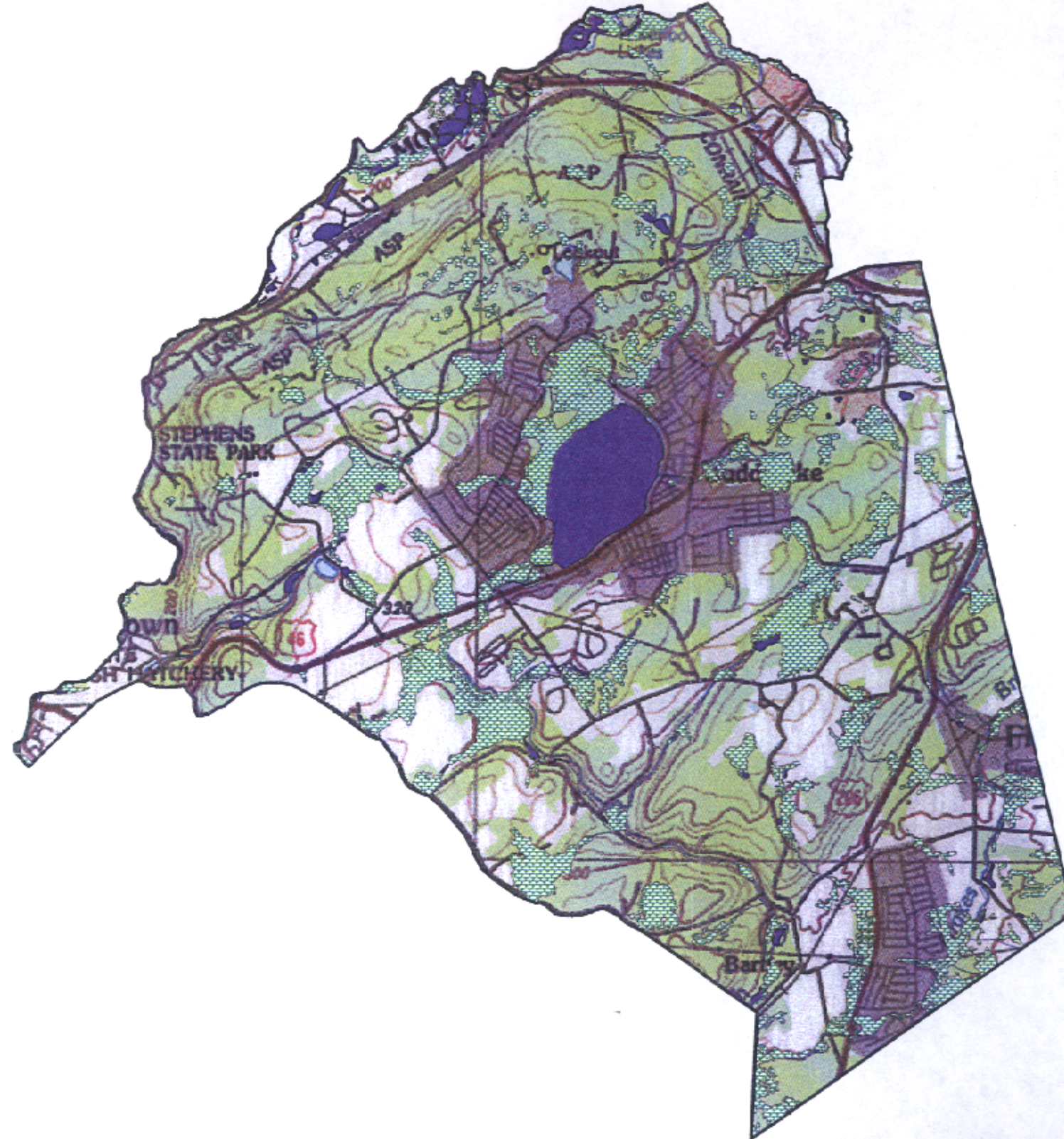


FIGURE 5: ENVIRONMENTAL FEATURES FOR MOUNT OLIVE TOWNSHIP OUTLINED ON A USGS 7.5 MINUTE QUAD MAP. ENVIRONMENTAL FEATURES DERIVED FROM NJDEP GIS COVERAGES.



ENVIRONMENTAL FEATURES

MOUNT OLIVE TOWNSHIP

STORMWATER MANAGEMENT PLAN

MT. OLIVE TOWNSHIP MORRIS COUNTY NEW JERSEY

PROJECT NUMBER: SJS416 DATE: AUGUST 2002

DRAWN BY: SES

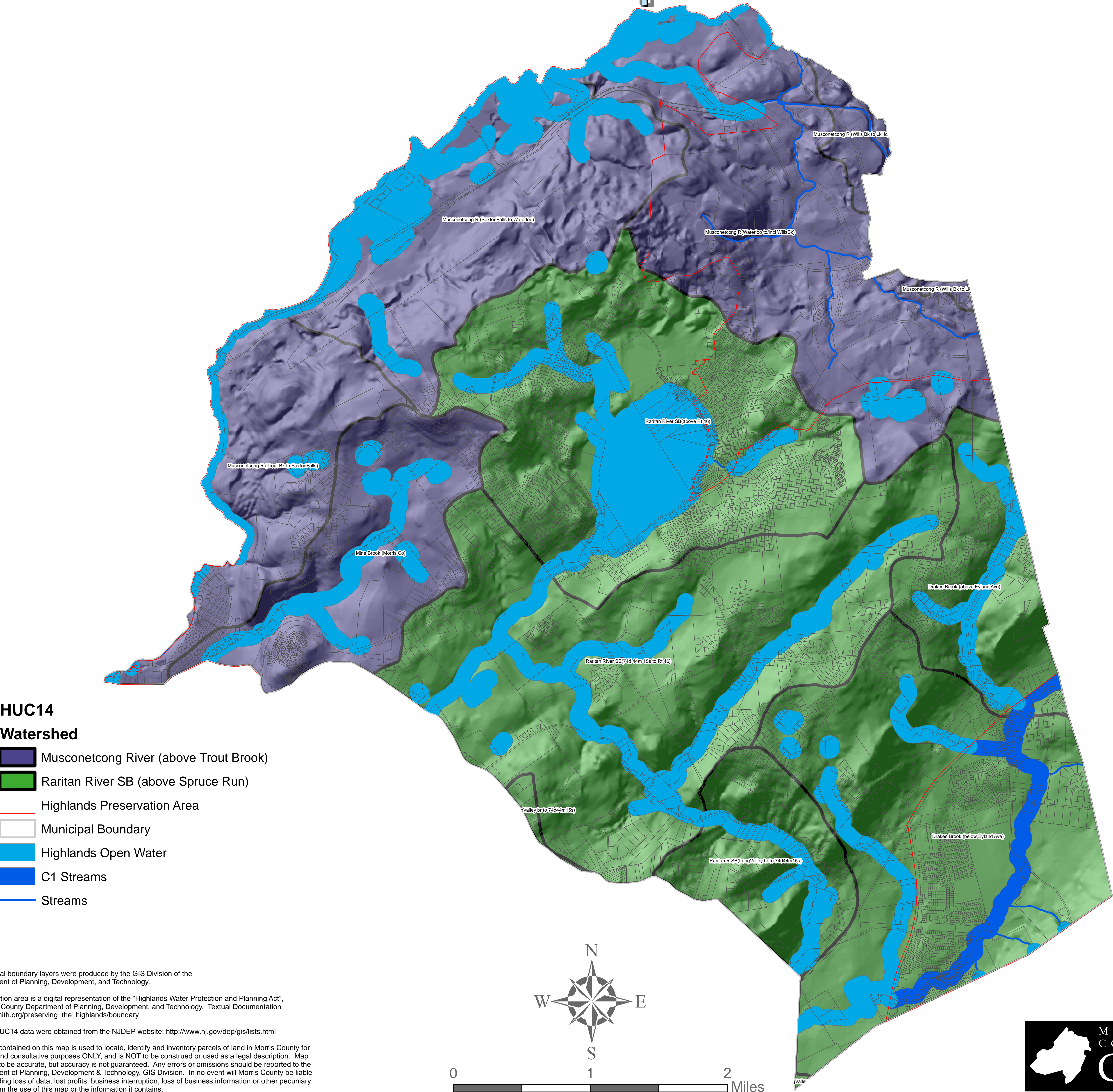


SCHOOR DEPALMA
Engineers and Design Professionals

Hydrological Units (HUC14s)

for

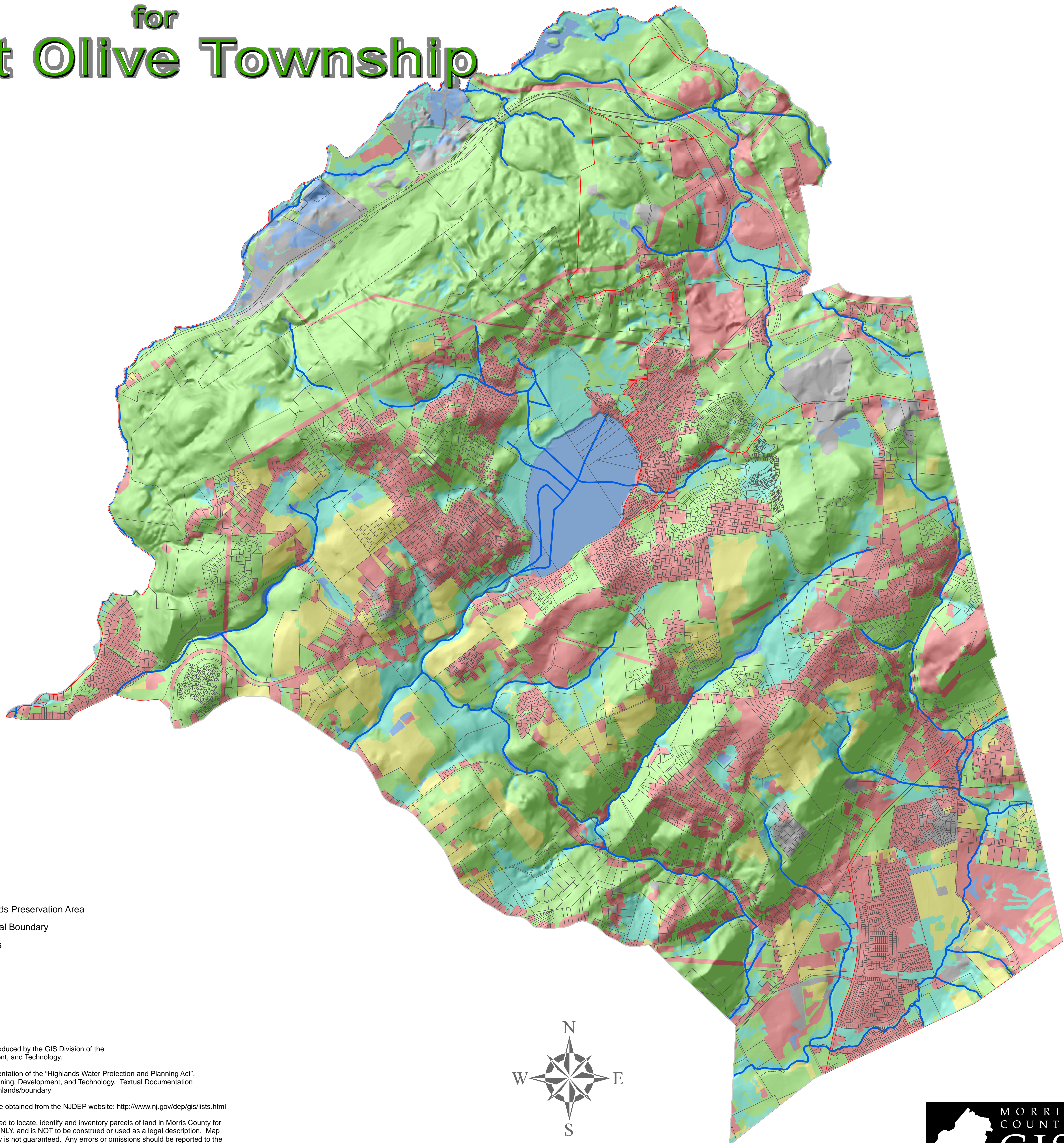
Mount Olive Township



Land Use Land Cover

for

Mount Olive Township



Land Use/Land Cover

- | | |
|-------------|-----------------------------|
| AGRICULTURE | Highlands Preservation Area |
| FOREST | Municipal Boundary |
| URBAN | Streams |
| WETLANDS | |
| WATER | |
| BARREN LAND | |

Source:

The parcel and municipal boundary layers were produced by the GIS Division of the Morris County Department of Planning, Development, and Technology.

The highlands preservation area is a digital representation of the "Highlands Water Protection and Planning Act", produced by the Morris County Department of Planning, Development, and Technology. Textual Documentation can be obtained at: bsmith.org/preserving_the_highlands/boundary

The water layers and land use/land cover data were obtained from the NJDEP website: <http://www.nj.gov/dep/gis/lists.html>

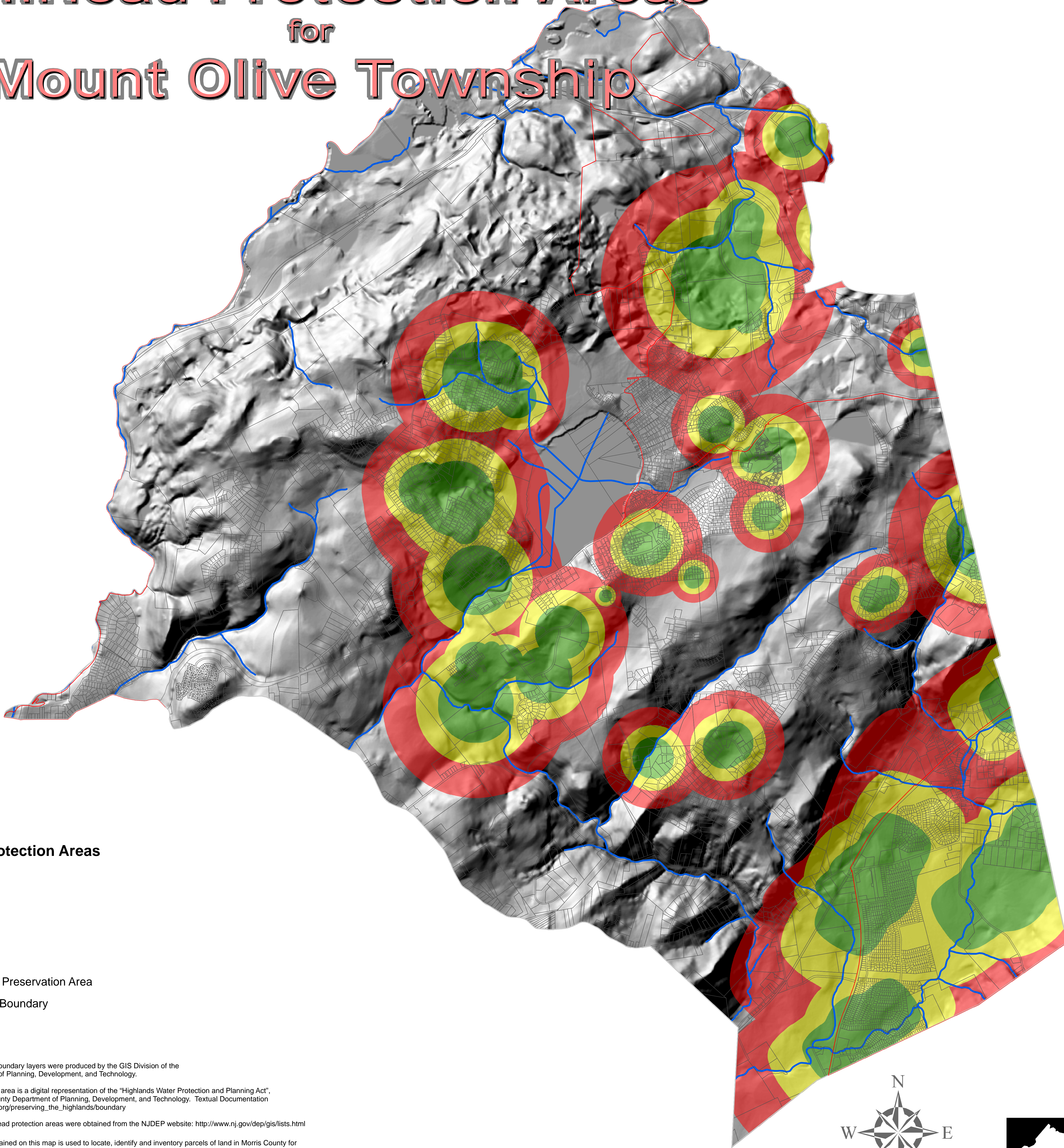
The parcel information contained on this map is used to locate, identify and inventory parcels of land in Morris County for deliberative, advisory, and consultative purposes ONLY, and is NOT to be construed or used as a legal description. Map information is believed to be accurate, but accuracy is not guaranteed. Any errors or omissions should be reported to the Morris County Department of Planning, Development & Technology, GIS Division. In no event will Morris County be liable for any damages, including loss of data, lost profits, business interruption, loss of business information or other pecuniary loss that might arise from the use of this map or the information it contains.



WellHead Protection Areas

for

Mount Olive Township



Wellhead Protection Areas

- TIER**
- 0
 - 1
 - 2
 - 3
- Highlands Preservation Area
- Municipal Boundary
- Streams

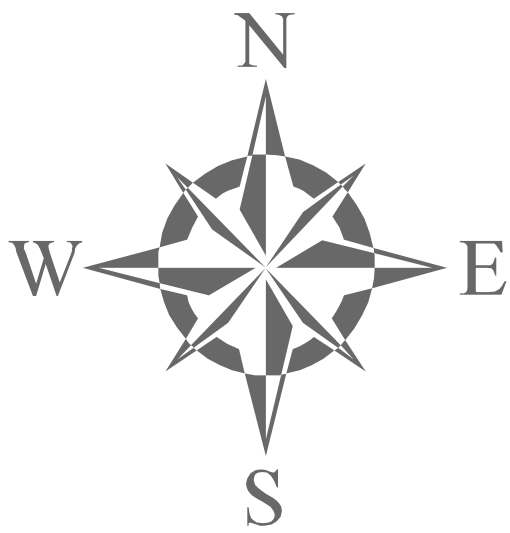
Source:

The parcel and municipal boundary layers were produced by the GIS Division of the Morris County Department of Planning, Development, and Technology.

The highlands preservation area is a digital representation of the "Highlands Water Protection and Planning Act", produced by the Morris County Department of Planning, Development, and Technology. Textual Documentation can be obtained at: bsmith.org/preserving_the_highlands/boundary

The water layers and wellhead protection areas were obtained from the NJDEP website: <http://www.nj.gov/dep/gis/lists.html>

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SECTION 600

Stormwater Management

600 Stormwater Management

601 General Policies

All subdivision and site plans subject to County approval shall provide for the management of stormwater runoff in a manner consistent with the following policies:

- A. All subdivisions and site plans shall provide adequate drainage structures in accordance with the standards established herein for the management of stormwater runoff that is generated by a development that now flows or will flow directly or indirectly to a County road or through a County drainage facility.
- B. The developer shall be responsible for providing adequate drainage systems along County roadways as required and in accordance with the standards and construction details herein.
- C. Stormwater runoff from a development tributary to County roadways or county drainage facilities or any development which lies within a County designated Stormwater Management Area shall submit a Stormwater Control Plan which provides for drainage improvements of adequate design and capacity to intercept and dispose of stormwater from the proposed development in a manner which does not increase the drainage impact upon the County roads, County-maintained drainage facilities, or drainage systems within designated stormwater management areas.
- D. All subdivisions and site plans requiring a Stormwater Control Plan and affecting County roadways or County drainage/stormwater management facilities shall be required to submit hydraulic calculations documenting the drainage basin studies. Depending on the location of the site in relationship to the total drainage basin, an on-site stormwater detention facility may be required where it is found that the installation of the facility will reduce the overall impact of stormwater runoff. In cases where on-site detention will not reduce the overall impact of stormwater runoff rate, and will not be effective due to specific site limitations such as space limitations, topography, location in the common drainage area and wetland conservation areas, a detention facility will not be required. All such developments releasing an increase in stormwater peak runoff from predevelopment conditions into the County stormwater system shall be required to contribute to the improvements of County drainage channels, structures, and/or regional detention facilities within the common drainage area or a designated stormwater management area. The costs will be determined by the County Engineer based on the area of the site in relationship to the total drainage area and considering the amount of increased runoff rate from the site. Developments providing on-site infiltration or recharge facilities, and resulting in no change or increase in the amount of predevelopment stormwater runoff off-site, will not be required to contribute to County improvements.
- E. In cases where stormwater runoff from a development discharges to streams, lakes, wetlands or other water bodies, the County may require special filtration and other water control measures in order to meet current permissible water quality standards and reduce the risk of contamination of the receiving water body from stormwater runoff. The applicable water quality standards are contained in NJDEP rules cited as NJAC 7:8-1.1 et. seq., NJAC 7:9-4.1 et. seq., 7:14A-3.1 et. seq. and NJAC 8:9-5.1 et. seq.
- F. When necessary as determined by the County Engineer these stormwater management standards will be supplemented by performance criteria and guidelines in the

Morris County Stormwater Management Technical Guide and the NJDEP Stormwater Management Best Management Practices Manual.

- G. Non-structural methods of stormwater management shall be used to the greatest extent possible for the purpose of minimizing stormwater volume and total suspended solid generation, maintaining natural filtration, simulating natural drainage systems and minimizing the discharge of pollutants to ground and surface waters.
- H. These policies and standards are intended to serve the needs of the County for the design of stormwater control plans, systems and facilities under its jurisdiction. The County Standards shall not take precedence over any municipal stormwater control ordinance which regulates the design of the systems and facilities internal to the development site. In such instances which involve the detention or retention stormwater flowing from the site into a County maintained drainage system or facility, the more stringent of the two standards shall be applied.

602 Stormwater Control Plan and Contents

Subdivisions and site plans draining to a County maintained drainage system, or situated within a designated Stormwater Management Area, shall submit a Stormwater Control Plan and report containing (in addition to the information required in Section 300) the following information:

- A. Separate pre and post development contoured drainage maps outlining area referenced in the study with acreage, runoff, curve numbers and time of concentration paths, areas detained and undetained, proposed drainage structures and common points of analysis.
- B. The resultant changes in the volume and peak rate of runoff for the designated storms from the various areas on the site toward the County drainage structures showing, in the instance of detention basins, inflow, outflow, undetained flow and total flow.
- C. The proposed location of stormwater measures, the run-off volume, peak rate, flow path, detention and retention of stormwater on-site for the designated storms.
- D. The volume and peak rate of off-site stormwater discharged from the site for the designated storms.
- E. Hydraulic computations for the analysis and design of the stormwater control facilities. All calculations, assumptions and criteria used in the design analysis should be justified and documented.
- F. Detention basin routing computations by the Storage Indication (Modified PULS) Method or other appropriate procedure or method for the specified design storms.
- G. Data, illustrations and narrative outlining provisions to meet water quality requirements.
- H. Computations showing the total additional impervious surface for the development.

603 County Storm Drainage Systems and Stormwater Management Areas

- A. It shall be the applicant's responsibility to provide adequate drainage facilities along County roadways and within County Stormwater Management Areas as required by the County Engineer.
- B. When a drainage system or any part thereof is proposed for a development which relates to a County roadway or County Stormwater Management Area, the additional capacity necessary to accommodate the anticipated increased stormwater runoff from the development, or of areas tributary to the drainage system, shall be determined in accordance with the following procedures:
 - 1. The capacity and design of the drainage structure or system to accommodate stormwater runoff shall be determined by the applicant's engineer in accordance with Section 608 of these Standards. Storm drainage calculations and a storm drainage map shall be submitted by the applicant's engineer.
 - 2. If it is necessary to enlarge a drainage structure or system the applicant's engineer shall prepare plans and designs required to provide capacity for the anticipated increase in stormwater runoff for the post-development and for the predevelopment flow of stormwater for areas outside of the development which are tributary to the drainage system, subject to the approval of the County Engineer.
 - 3. If determined by the County Engineer a drainage structure or system cannot be enlarged by the applicant, the applicant shall make payment to the County in lieu of the installation of the drainage system. The County may also participate in the construction of improvements, or assume responsibility for construction of the drainage system. Payment for all improvements shall be consistent with the provisions of Section 800.

604 Existing County Bridges and Culverts on Roads to be Widened

- A. Where road pavement widening is required by these Standards, the developer shall extend bridges and culverts to the full width of the widened traveled way or future pavement width, whichever is greater, plus a sidewalk or embankment area, if such is required. In no instances, however, shall the traveled way be less than 26 feet (13 feet from centerline).
- B. Where these Standards require widening on both sides of the road, the culvert or bridge shall be extended, or replaced as specified in Section 604:A.
- C. Where an existing bridge or culvert is found to be structurally or hydraulically inadequate to serve the proposed development, then total replacement of the structure shall be required by the Planning Board.
- D. When bridges and culverts are designated for replacement but immediate replacement is found to be impossible or impractical, then full payment of the total replacement cost shall be charged to the developer as provided in Sections 103:C and in accordance with Section 803 of these Standards.
- E. The design of bridges and culverts to be extended or replaced shall conform to the procedures and standards of The Bridge and Culvert Policy of the County of Morris, adopted by the Morris County Board of Chosen Freeholders, April 14, 1993 [See Appendix C].

605 New Bridges and Culverts

The County may assume jurisdiction and future maintenance of bridges and culverts on municipal roadways within developments when said structures will be for the purpose of spanning a waterway and will have a nominal four (4) foot clear span or greater. Said structures must further comply with the applicable standards for procedures, design, and construction as set forth in "The Bridge and Culvert Policy of the County of Morris", adopted by Resolution of the Board of Chosen Freeholders of Morris County, April 14, 1993. (See Appendix C).

606 Bridges and Culverts Downstream of Development

- A. All developments, which drain to an existing County bridge or culvert, will be considered to directly increase the hydraulic requirements of that structure. Residential subdivisions of 3 lots or less, not involving any other subdivision action within the prior three years, and not involving addition of pavement, are exempted from this requirement.
- B. A developer shall be required to pay a proportionate share of the cost of correcting an adverse drainage condition when the Planning Board determines that a development situated in a drainage basin:
 - 1. Would create an immediate or potential effect on a County drainage structure, such as increased streamflows and discharges; or
 - 2. When the development lies in a drainage basin where drainage facilities have previously been installed, replaced or altered under the provisions of these Standards.
- C. The proportion of the cost of such facilities to be paid by a developer whose proposed development would drain into such facility will be equal to the proportion that the acreage of the proposed development bears to the acreage of the entire drainage basin. The developer's engineer shall perform all calculations of storm runoff based on consideration of the physical features of the basin and the future development of the area based on the existing local zoning ordinances. The County Engineer shall on behalf of the Planning Board review said calculations.
- D. The proportionate cost of the drainage facility installation or alteration will be the estimated cost of installing the new facility as calculated by the County Engineer, plus 10 percent for contingencies. In cases where the payment is to be made toward the proportionate cost of facilities previously installed or the cost of previously performed alterations, the actual cost of the work performed will be used in place of an estimated cost.
- E. Regardless of any other provision in these standards, the developer will not be financially responsible for any part of existing drainage facilities for which full payment has previously been made to the County by other developers in the same drainage basin.

607 Drainage Rights of Way and Easements

- A. All developments traversed by a water course, drainageway channel or stream shall provide a storm-water drainage easement or drainage right-of-way of such width as may be deemed necessary and adequate for the purpose of maintaining and preserving the drainage facility. The existing natural drainage features shall be preserved wherever possible in the design of the development.

- B. Drainage easements shall be established for all existing and proposed enclosed storm drainage systems. The purpose of the drainage easement shall be to enter upon, operate and maintain the system. The easement shall be no less than 20 feet in width.
- C. All stormwater detention and infiltration facilities shall provide easements to permit access for maintenance in accordance with minimum standards established by the County or Municipal Engineer. A minimum width of 20 feet for the entire perimeter of the facility should be provided.
- D. Where a development by necessity, design, or both, must discharge storm drain runoff or alter the course of a stream to flow onto or across lands of the downstream property owner(s), for which there is no drainage easement of record, the developer shall secure the necessary easement and/or right-of-discharge agreement from the downstream property owner and submit a copy of the easement and/or right-of-discharge agreement to the Planning Board.
- E. The site plan or final development plat which is to be recorded in the Office of the Morris County Clerk shall show all drainage easements and "Dedicated to the County of Morris" (Town, Township or Borough) for storm drainage purposes," whichever is appropriate. In addition the developer shall furnish the County Planning Board with deed of easement in accordance with Section 800 of these Standards.

608 Storm Drainage Design Criteria

A. Methodology

- 1. All drainage facilities shall be designed using one of the following methods as appropriate:
 - a. Rational Method - for peak discharges of uniform drainage areas up to 50 acres.
 - b. Modified Rational Method - for runoff volumes of uniform drainage areas of less than 20 acres.
 - c. Soil Conservation Service (S.C.S.) Technical Release No. 55 - for drainage areas between 1 acre and 2000 acres.
 - d. Other methods described in the Morris County Stormwater Management Technical Guide subject to approval of the County Engineer.
- 2. Drainage calculations shall include computations of the total drainage basin area and the percentage of the total drainage from a development which connect directly into an existing County storm drain or requires drainage facilities to be installed within the County right-of-way. The applicant's engineer shall submit hydraulic calculations for all storm drains, ditch cross sections, swales, culvert and bridge details which are part of, or related to, the development. A storm drainage map shall also be provided indicating the area tributary to the County roadway or drainage facility.
- 3. Drainage calculations for storm drain pipes shall be based on Mannings formula for pipes flowing full, as outlined in the Morris County Stormwater Management Technical Guide.

4. Detention and retention facilities are to provide stormwater management for the proposed project and such facilities shall be designed to control stormwater runoff for the 2, 10, and 100 year storm events so that peak flow rates and velocities are not increased at or downstream of the point of discharge.
5. Recharge facilities shall provide stormwater management for the proposed project, and shall be designed to accommodate the additional runoff volume for the 100 year storm, and empty within 3 days.

B. Pipelines and Open Channel Hydraulics.

All storm sewers and open channels shall serve two major functions:

1. To carry the maximum discharge for which it is designed.
2. To transport suspended solids in such a manner that deposits in the sewer are kept to a minimum.

C. Design Formulas

1. Rainfall intensity shall be taken from Figure 600-1 "Rainfall Intensity Curves for Morris County" found at the back of this Section 600. All pipelines within the development, County roadway drainage system, and stormwater systems shall be designed to carry flows of the 25 year storm frequency. All open channels, culverts or bridges shall be designed for a 25 year storm frequency when the upstream drainage area is less than 50 acres. When the upstream drainage area equals or exceeds 50 acres, all open channel culverts and bridges shall be designed for the 100 year storm frequency.
2. The runoff coefficient for a development shall be derived based on the future development of the project.
3. The values of the runoff coefficients shall be approved by the County Engineer and shall be in accordance with typical values established in Table 600-1. Further adjustment of the "Rational Formula" may be necessary for storms which exceed the 10 year recurrence interval (see Part B of Table 600-1).
4. Minimum design velocity for pipes flowing full shall be 2.5 feet per second and the maximum velocity for pipes flowing full shall be 8 feet per second.
5. The friction factor Manning Coefficient "n" for pipe conduits shall be in accordance with the Morris County Stormwater Management Technical Guide "Values of the Roughness Coefficient "n" as reprinted in Appendix D of these Standards.

D. Line Transition

For pipe sizes less than 48 inches in diameter, all transition in slope, horizontal direction, junction, and change in pipe sizes shall be confined to manholes, catch basins, or other accessible structures designed for one or more of these purposes. For pipelines 48 inches and larger, horizontal deflections may be accomplished without the use of such structures if the radius of the curve in feet is greater than ten times the diameter in inches of the proposed pipe.

E. Open Channel Flow

Table 600-1: Runoff Coefficients (Antecedent Moisture Condition) AMCII

Part A Land-use Description	Hydrologic Soil Group			
	A	B	C	D
Cultivated land: without conservation treatment	0.49	0.67	0.81	0.88
with conservation treatment	0.27	0.43	0.61	0.67
Pasture or range land: poor condition	0.38	0.63	0.78	0.84
good condition	NA	0.25	0.51	0.65
Meadow: good condition	NA	NA	0.44	0.61
Wood or forest land: thin stand, poor cover, no mulch	NA	NA	0.59	0.79
good cover	NA	NA	0.45	0.59
Open spaces, lawns, parks, golf courses, cemeteries: good condition, grass cover on 75% or more of area	NA	0.25	0.51	0.65
fair condition, grass cover on 50-74% of area	NA	0.45	0.63	0.74
Commercial and business areas (85% impervious)	0.84	0.90	0.93	0.96
Industrial districts (72% impervious)	0.67	0.81	0.88	0.92
Residential: Average lot size Average impervious				
1/8 acre 65%	0.59	0.76	0.86	0.90
1/4 acre 38%	0.25	0.55	0.70	0.80
1/3 acre 30%	NA	0.49	0.67	0.78
1/2 acre 25%	NA	0.45	0.65	0.76
1 acre 20%	NA	0.41	0.63	0.74
Paved parking lots, roofs, driveways, etc.	0.99	0.99	0.99	0.99
Streets and roads: paved with curbs and storm sewers	0.99	0.99	0.99	0.99
gravel	0.57	0.76	0.84	0.88
dirt	0.49	0.69	0.80	0.84
NOTE: NA denotes information is not available; design engineers should rely on another authoritative source.				
SOURCE: New Jersey Department of Environmental Protection, Technical Manual for Land Use Regulation Program, Bureaus of Inland and Coastal Regulations, Stream Encroachment Permits (Trenton, New Jersey: Department of Environmental Protection, Revised September 1995) p. 51				

Part B
Adjustment Factors for Runoff Coefficients

Frequency of Event (years)	Runoff Coefficient Adjustment Factor
2 to 10	0.8
25	0.88
50	0.96
100	1
NOTE: These adjustment factors are from a similar table presented on page 3-61 of Design of Urban Highway Drainage, The State of the Art, Report No. FHWA-TS-79-225, U.S. Department of Transportation, Federal Highway Administration, Offices of Research and Development, Implementation Division (HDV-21), August 1979.	
The values in this table are to be used with the Rational formula, where the runoff coefficient is taken from Table 600-1, Part A.	

SOURCE: New Jersey Residential Site Improvement Standards, N.J.S.C., Title 5, Chapter 21

Open channels shall be designed using the Mannings Formula for hydraulic flow and the size and shape shall meet the requirements of runoff, depth, side slope, gradient, and velocity limitations in accordance with site conditions. The friction factor of open channels shall be in accordance with Table 4-2 of the Morris County Stormwater Management Technical Guide. "Values of the Roughness Coefficient "n" as reprinted in Appendix D of these Standards. Open channels shall also be designed so that the velocities do not exceed those stated in Table 600-2.

Table 600-2: Allowable Open Channel Velocities

Soil Type	Allowable Velocities (Feet Per Second)
Sands	1.8
Sand loam (noncolloidal)	2.5
Silt loam (also high loam clay)	3.0
Sandy clay loam	3.5
Clay loam	4.0
Clay, fine gravel, (graded loam to gravel)	5.0
Cobbles	5.5
Shale	6.0
Concrete lined ditch	10.0
Channels and other drainage systems shall be protected by the use of vegetation, rip rap, or paving and area subject to approval by the County Engineer.	

609 Design of County Storm Drainage Systems

- A. Hydraulic calculations for storm drainage pipelines shall be based on Mannings Formula for pipes flowing full or other approved design methods acceptable to the County Engineer.
- B. Pipelines shall be designed to carry the maximum runoff when flowing full.
- C. The minimum design velocity for pipes flowing full shall be 2.5 feet per second.
- D. Minimum pipe diameters shall be 15 inches.
- E. Pipes used shall be reinforced concrete pipe, Class III, Wall B, unless otherwise directed and approved by the County Engineer, and shall have a minimum of 2 feet of cover over the top of the pipe wherever possible. Where minimum cover cannot be obtained, the pipe strength shall be increased as approved by the County Engineer.
- F. All changes in pipe size, slope and horizontal direction shall be made in a manhole, inlet or other accessible structure designed for the above purpose. All pipe ends shall be encased in a head-wall or other appropriate structure conforming to the construction details provided in Figures 600-8 and 600-9 of these Standards.

610 Storm Sewer Layout

- A. Inlet spacing shall not exceed 250 feet or a design inlet flow of 6 cubic feet per second, whichever conditions shall be more stringent. Access manholes shall be spaced at 500 foot intervals through right-of-ways and at sewer junctions where there are no catch basins.
- B. Inlets shall be located to intercept stormwater runoff before the runoff crosses intersections or crosswalks and at the beginning and end of new curbing.

- C. All drainage facilities upon completion of construction shall be cleared of all debris, dirt and other objectionable material and shall be maintained in clean condition until such time as maintenance is accepted by the County Engineer.
- D. Grease traps, oil skimmers, sediment basins and other water quality improvement or "Best Management Practices" structures shall be installed as required.

611 Storm Sewer Construction Standards

All inlets and manholes shall conform to the following Standards unless otherwise approved by the County Engineer.

- A. Corbelling of inlet walls will be permitted at the rate of 1/2 inch per 8 inch of height of wall: maximum corbel, 6 inches per wall.
- B. When the item of manholes, inlets and additional depth, is scheduled in the proposal and the depth of a structure exceed 10 feet as measured from top of cover or grate to invert of drainage structure, the walls of the structure below a depth of 8 feet shall be 12 inches thick and the overall horizontal dimensions of foundations shall be increased 12 inches and (except in rock) the depth increased to 12 inches.
- C. Except for Type "A" inlets, footings and inverts shall be constructed in two stages, and the bottom of the footings shall be 8 inches below the outer wall of the lowest pipe in inlets and 10 inches in manholes concrete to be Class "D".
- D. The item of reset heads shall include raising or lowering the head castings of inlets or the raising of manhole head castings, for a maximum of 12 inches. All other changes in position of head casting shall be considered as reconstructed manholes or reconstructed inlets or catch basins.
- E. When curb piece height specified is greater than curb face height, depress the gutter of grate so that the top of the curb piece is at the same elevation as the top of curb.
- F. Inlet or manhole may be constructed of brick, concrete or concrete block. If brick or concrete block is used, the bottom shall be as shown for concrete.
- G. Precast concrete manholes, inlets or catch basins shall conform to the requirement of ASTM Specification C478-72A and shall withstand an HS-20 highway loading as per Article 5.3.2 of New Jersey State Highway Department Standard Specifications for Road and Bridge Construction for 1961, as supplemented and amended.
- H. Construction details shall conform to the Figures 600-2 through 600-10 found in the back of this Section 600.

612 Stream Encroachment & Wetlands Permits

All projects with a total tributary drainage area less than 150 acres and all minor projects, as defined by the New Jersey DEP Flood Hazard Control Act, with a total tributary drainage area less than 320 acres at the downstream most end of the project, may be approved by the County Engineer or by the Municipal Engineer. All other projects must make application for a stream encroachment permit from the NJDEP. A copy of said application shall be forwarded by the applicant to the County Engineer. Stream encroachment lines established by the NJDEP shall be identified with bearings and distances on the subdivision plat or site plan submitted to the County for approval.

613 Detention, Recharge, Water Quality Facilities

Where required by these Standards, and as determined by the County Engineer, developments must construct stormwater detention/retention facilities to control the volume of runoff, rate of discharge and quality of water being discharged from the site. If municipal standards exist which differ from those of the County, the more stringent of the two standards would apply.

A. Stormwater Control

1. The stormwater runoff resulting from the development of a site for the 2, ~~10~~, 25 and 100 year storm events shall be controlled so that the pre-development peak flow rates and velocities from the site onto downstream properties, watercourses, and/or drainage systems is not increased at or downstream of the point of discharge.
2. If a Stormwater Management Plan for the region or watershed containing the watercourse affected by a proposed development has been adopted by the County, the applicant shall design the project and its stormwater management facilities to conform to that plan.
3. Where an adopted Stormwater Management Plan does not exist for the watershed, then the applicant shall provide for on-site detention facilities such that the development's post-project construction peak runoff for the two (2) year storm event is 50 percent of the pre-project construction peak runoff rate and; the post-project construction peak runoff rates for the 10 and 100 year storm events shall be 75 and 80 percent, respectively, of the pre-project construction peak runoff rates. These percentages only apply to the portion of the post-project runoff from the site under development. Off-site runoff may be computed at 100 percent of the pre-project rate.
4. The design storms used to achieve the required level of site runoff control described in Section 613:A-2 shall be defined as either a 24-hour storm using the rainfall distribution recommended by the U.S. Department of Agriculture, Soil Conservation Service, or as the estimated total rainfall falling uniformly throughout the critical storm duration (which shall equal or exceed the estimated time of concentration) at the site when using a design method such as the Modified Rational Method. A 20 acre drainage area shall be the maximum used for the modified rational method unless otherwise approved by the County Engineer or as designated in the Standards adopted under the Site Improvement Act (N.J.S.A. 40:55D-40.1 et. seq).

B. Water Quality

All site development or redevelopment shall be required to provide water quality control measures to meet current permissible water quality standards (see Section 601 E).

All runoff within the water quality design storm cited in N.J.A.C. 7:8-1.1 et. seq. shall be controlled by maximizing the use of feasible nonstructural management practices appropriate to the site or by structural management facilities which meet the standards of this rule.

1. The water quality design storm shall be defined as the one-year frequency S.C.S. Type III, 24-hour or 1.25 inches of rainfall falling uniformly in 2 hours. All practices and facilities used to meet the stormwater runoff quality goal shall be designed to control the water quality design storm unless otherwise specified.

2. In computing the runoff from the water quality design storm, appropriate consideration shall be given to the relative runoff potential of pervious and impervious areas in order to accurately compute the rates and volume of runoff from the entire drainage area.
3. The water quality design storm shall be controlled by Best Management Practices. These include, but are not limited to the following:
 - a. In "dry" detention basins, provide for the retention of the water quality design storm, such that not more than 90 percent will be evacuated prior to 18 hours.
 - b. In permanent ponds or "wet" basins, the water quality requirements of these rules shall be satisfied where the volume of permanent water is at least three times the volume of runoff produced by the water quality design storm.
 - c. Infiltration practices such as drywells, infiltration basins, infiltration trenches, etc. may be used to meet the water quality standards, provided they produce zero runoff from the water quality design storm and allow for complete infiltration within 72 hours.
 - d. Other Best Management Practices may be incorporated in the site design in order to meet water quality standards such as but not limited to: minimizing land disturbance, clustering, use of natural drainage ways, water quality swales, water quality chambers and landscaping. Reference should be made to the following documents for other suitable BMP's and associated information:
 - i. New Jersey Stormwater Quantity/Quality Management Manual, New Jersey, Department of Environmental Protection, February 1981.
 - ii. Stormwater and Non Point Pollution Control, Best Management Practices Manual, State of New Jersey, Department of Environmental Protection, Office of Land and Water Planning.
 - iii. The Morris County Stormwater Management Technical Guide, Morris County Planning Board, May 1989.
 - iv. Any Phase II Regional Stormwater Management Plan.

C. Design Standards for Detention Facilities

1. Stormwater management facilities shall not be located within the floodway of the watercourse unless they are constructed on-stream as part of a Phase II regional or watershed stormwater management plan.
2. Stormwater management facilities design and construction shall be in conformance with the Soil Erosion and Sediment Control Act., N.J.S.A.4:29-39 et. seq.
3. Slopes - Side slopes of the facilities should not exceed 3:1 ratios.
4. Length-to-Width Ratio - All detention basins should have length to width ratios of at least 2:1 and maximize to the extent feasible the distance between pond inflow and outflow.

5. Vegetation - The facilities should have a vegetative cover of water-tolerant species. Suggested varieties of cover include reed canary grass, fescue, perennial rye, orchard grass and Bermuda grass.
 6. Outlets - Outlets from the facilities should be designed to function independent of manual, electric or mechanical controls. The outlets should have a minimum diameter of 3 inches. Trash racks consisting of vertical parallel bars, which can be cleaned from above with a rake, must be placed at all outlets.
 7. Detention/retention basins shall conform to the typical construction details as found in Figures 600-10 through 600-13 and supplemented by alternative schematic design features in Appendix E.
 8. A drainage easement shall be provided for all detention/retention basins and other related facilities for the purpose of access and maintenance.
- D. Alternative types of detention/retention facilities may be utilized in lieu of the conventional detention basin (subject to the approval of the County Engineer) in order to overcome existing physical limitations of the site and surrounding area. Alternative detention/retention options are as follows:
1. Wet ponds/retention basins
 2. Stormwater wetlands
 3. Stabilized, vegetated or biofilter swales
 4. Vegetated filter strips
 5. Infiltration basins
 6. Perforated pipes for underground recharge
 7. Underground Storage
- E. The design, construction of the above named detention/retention facilities shall comply with the standards of the Morris County Stormwater Management Technical Guide and supplemented by the NJDEP Stormwater Management Regulations (N.J.A.C. 7:8-3.4).
- F. Any retention system proposing the use of infiltration (recharge) must provide a soil feasibility test for review and approval by the County Engineer. The design of an infiltration system must also provide for the removal and filtering of objectionable pollutants using methods described in the Morris County Stormwater Management Technical Guide and NJDEP Best Management Practices Manual for Stormwater and Non-point Source Pollution Control.
- G. Any detention system proposing the use of underground storage for the purpose of controlling stormwater volume must provide for the treatment of the water quality design storm prior to stormwater discharges to the underground storage system.

614 Landscaping

- A. Upon completion of a detention basin recharge facility, the applicant shall immediately provide stabilization of the ground surface with seeding or sodding with a water tolerant grass. Where seasonal conditions do not permit seeding or sodding, a temporary mulch may be used. All of the above practices must be approved by

the Morris County Soil Conservation District and shown on the soil erosion and sediment control plan required by that agency.

- B. In cases where the detention/recharge basin has been used during construction for sediment control purposes, such facilities shall be restored by the removal of the accumulated sediment and debris, and sodded or re-seeded.

615 Maintenance

- A. Detention/retention facilities which are required by the County due to drainage impacts on County facilities shall, as a condition of subdivision/site plan approval, submit proof of a maintenance agreement to the County Planning Board for review and approval. After approval of the maintenance agreement, a copy will be placed on file in the County Engineer's office or some other appropriately designated location.
- B. The maintenance agreement shall provide a program and schedule to include:
 - 1. Grass mowing (no higher than 2 inches)
 - 2. Removal of debris from basin, trash rack, channel and culverts.
 - 3. Name, address, and phone number of individual, company, or government agency responsible for maintenance of the detention/retention facility.
 - 4. Removal of silt - responsible party shall periodically inspect the basin capacity and set limits for silt accumulation after which time responsible party shall remove and dispose of silt in order to maintain the storage capacity of the facility.

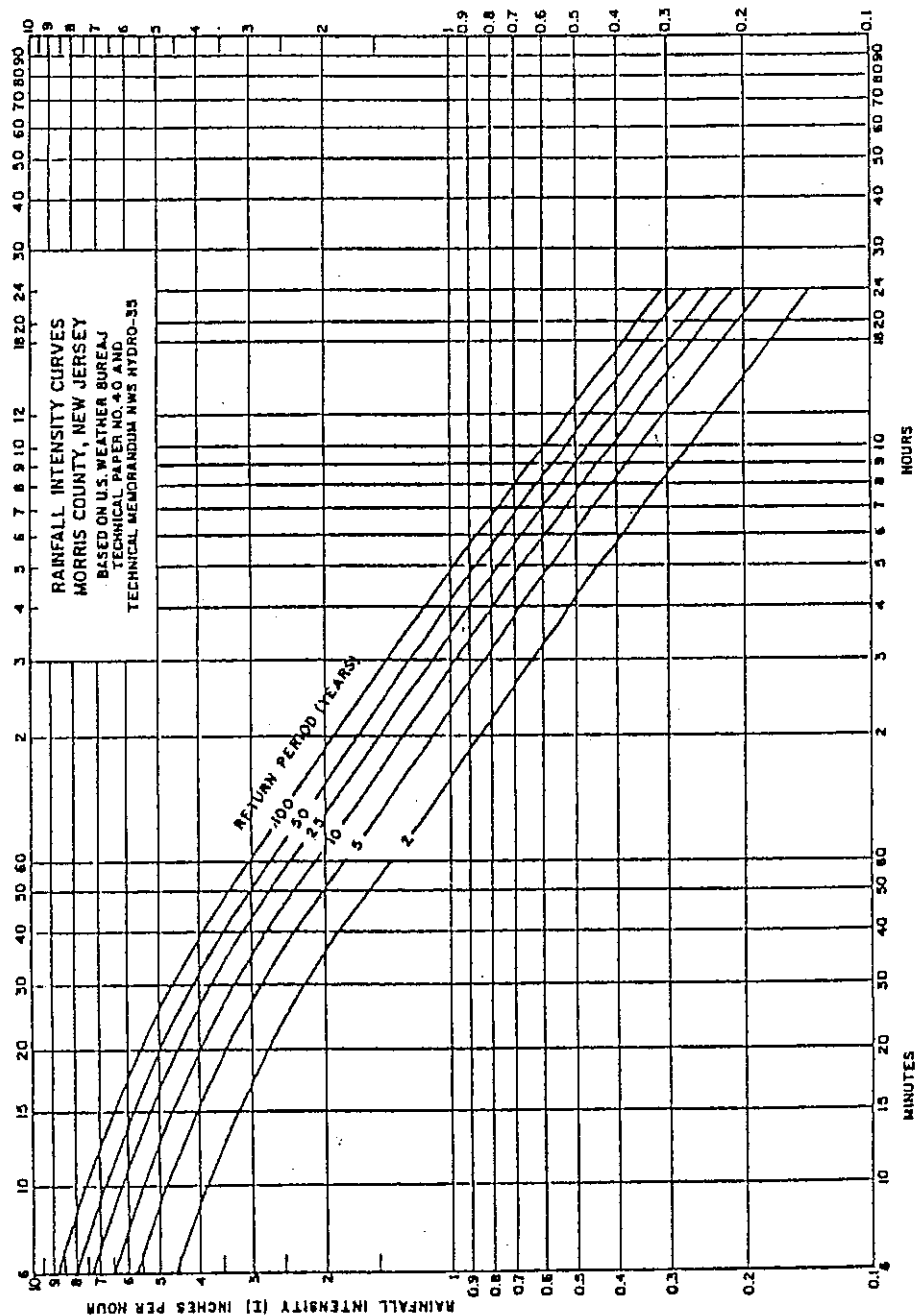


FIGURE 600-1

DURATION OF STORM

Rainfall Intensity Curves for Morris County

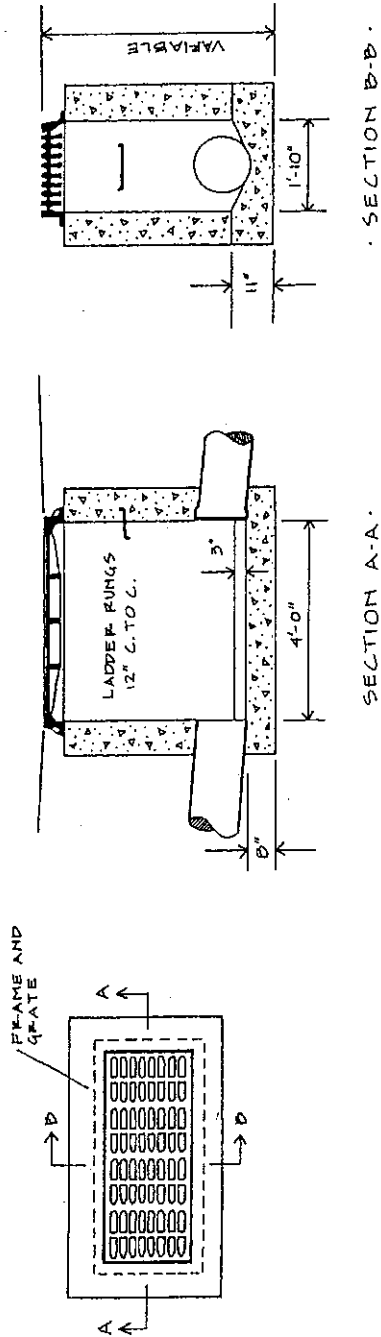


FIGURE 600-2	
Morris County Typical Detail	
Type "A" Inlet	
Not to Scale	10-95

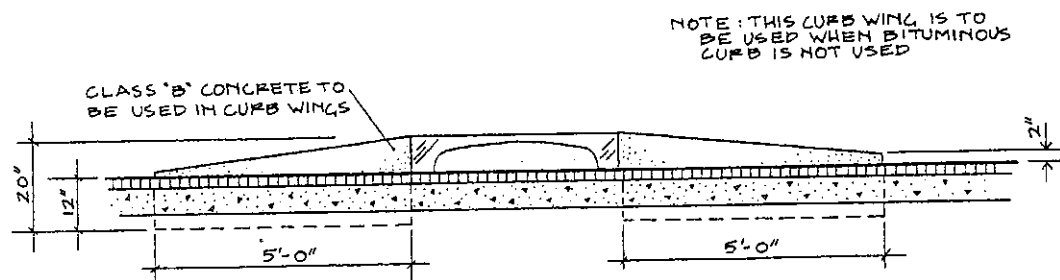
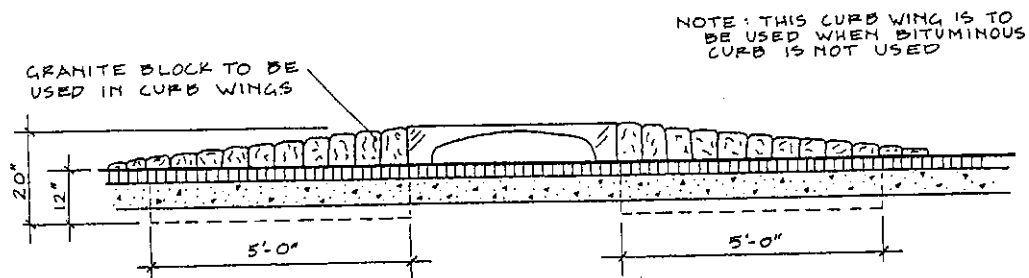


FIGURE 600-5

Morris County Typical Detail
Curb Wings

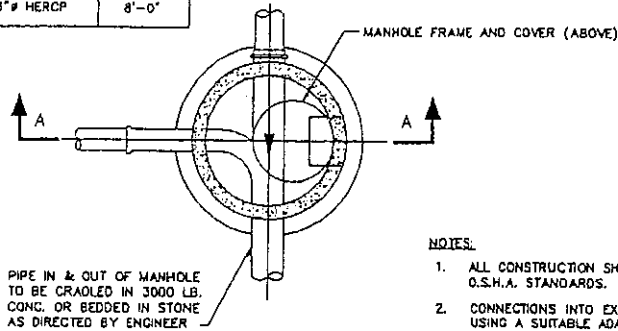
Not to Scale

10-95

NOTE:

THE STORM SEWER COVERS SHALL HAVE THE "TOWNSHIP NAME AND STORM SEWER" CAST ON.

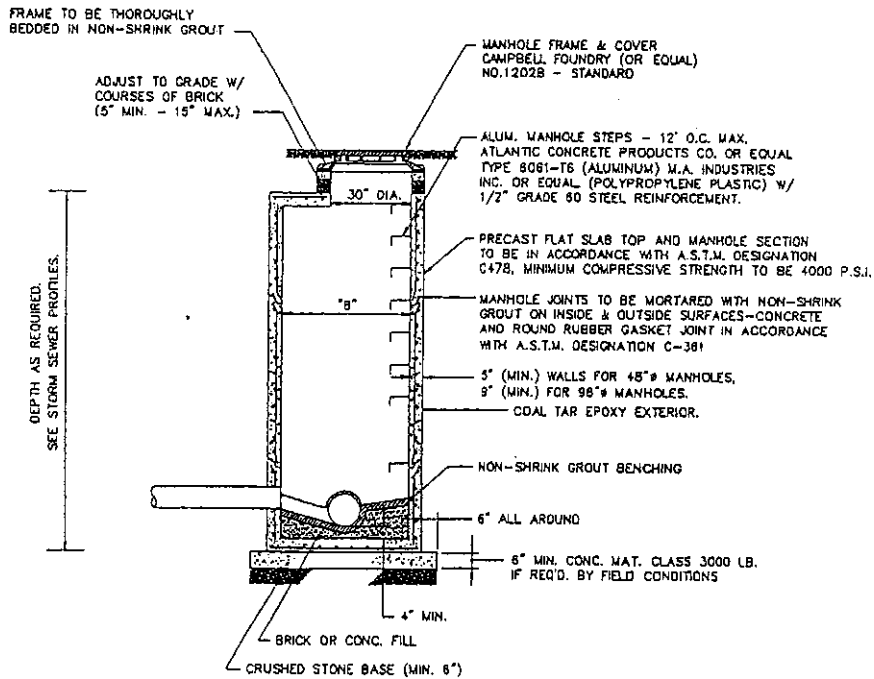
PIPE DIA. (D)	"B"
UP TO 18"	4'-0"
36" # HERCP	8'-0"



NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST O.S.H.A. STANDARDS.
2. CONNECTIONS INTO EXISTING MANHOLES SHALL BE COMPLETED USING A SUITABLE ADAPTOR AS APPROVED BY THE ENGINEER.

SECTIONAL PLAN



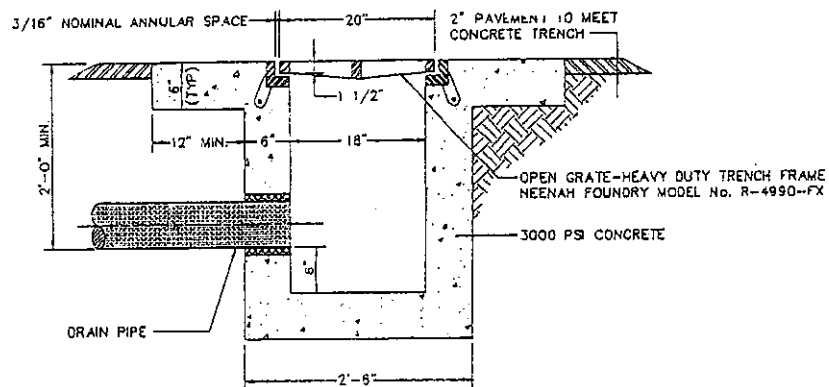
SECTION A - A

FIGURE 600-6

Morris County Typical Detail
Manhole

Not to Scale

10-95



10-95

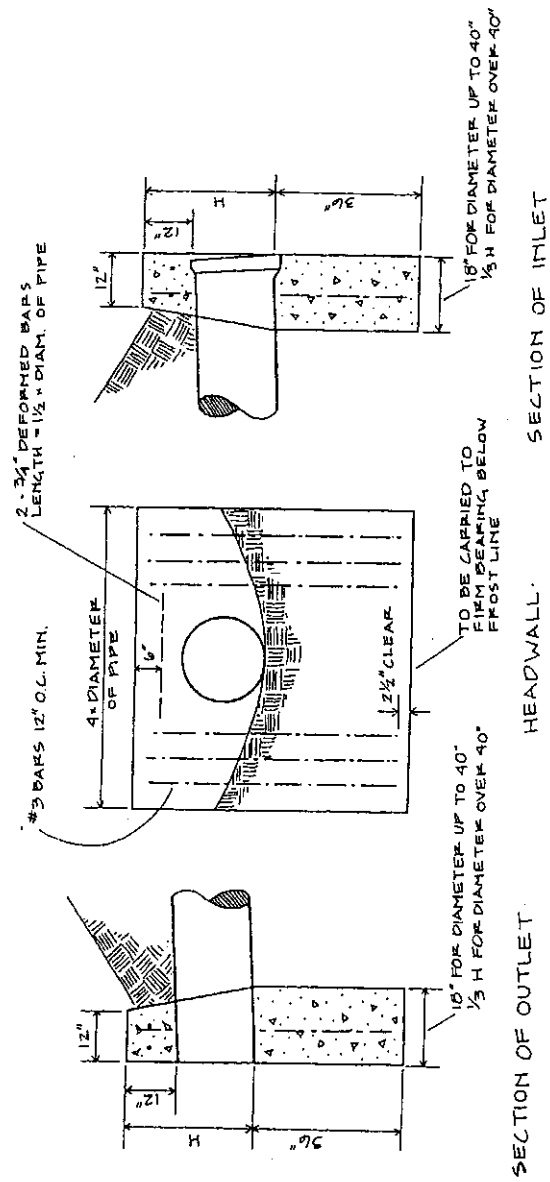


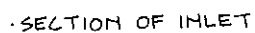
FIGURE 600-8

Morris County Typical Detail

Flat Headwall

Not to Scale

10-95



12"

12"

3"

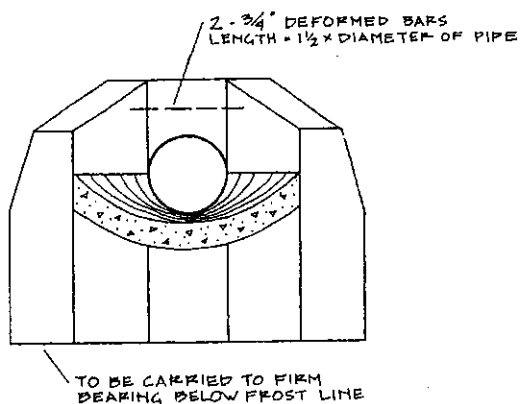
2'6"

1'4"

CONCRETE APRON
6" THICK

CLASS C
CONCRETE

1/2" FOR DIAMETERS UP TO 40"
1/3 H FOR DIAMETERS UP TO 40"



SECTION OF OUTLET.

·END VIEW OF OUTLET.

Not to Scale	10-95
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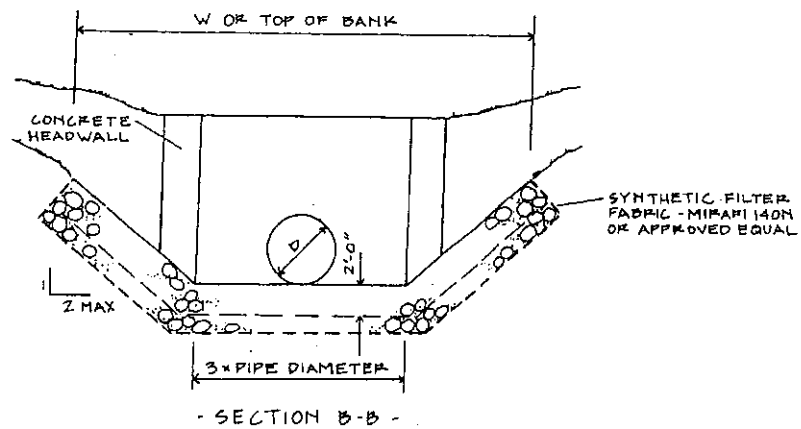
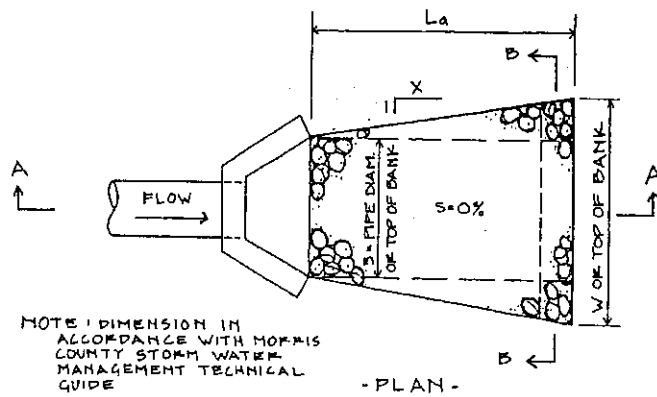
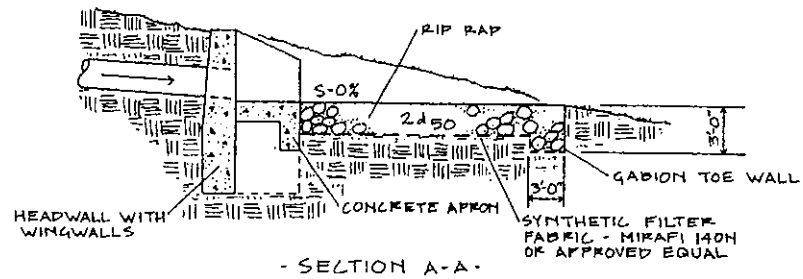


FIGURE 600-10	
Morris County Typical Detail Outlet Protection	
Not to Scale	10-95

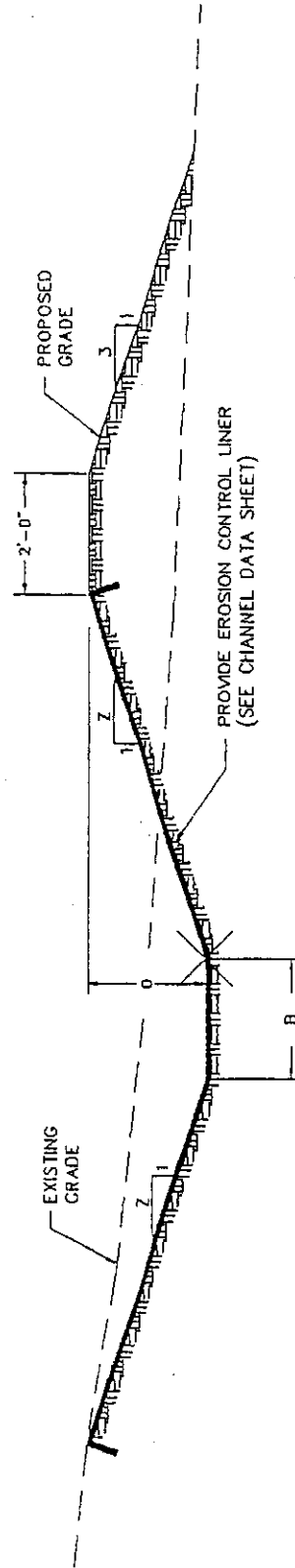


FIGURE 600-11	
Morris County Typical Detail Drainage Swale	
Not to Scale	10-95

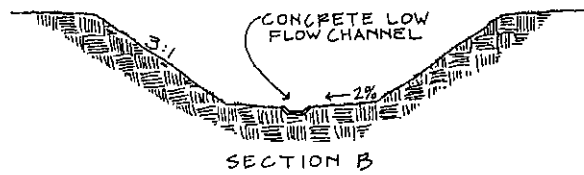
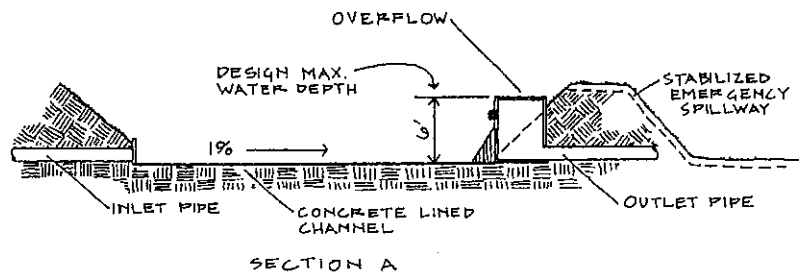
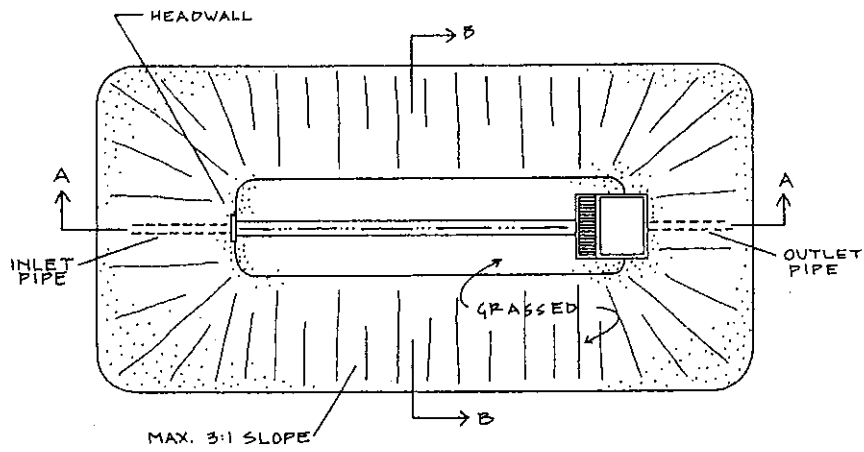


FIGURE 600-12

Morris County Typical Detail
Dry Detention Basin

Not to Scale

10-95

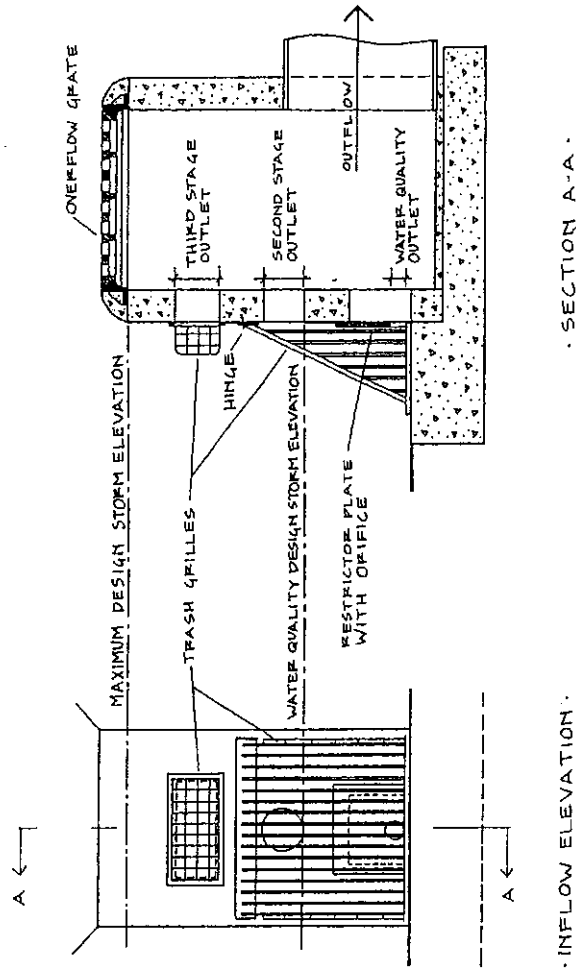
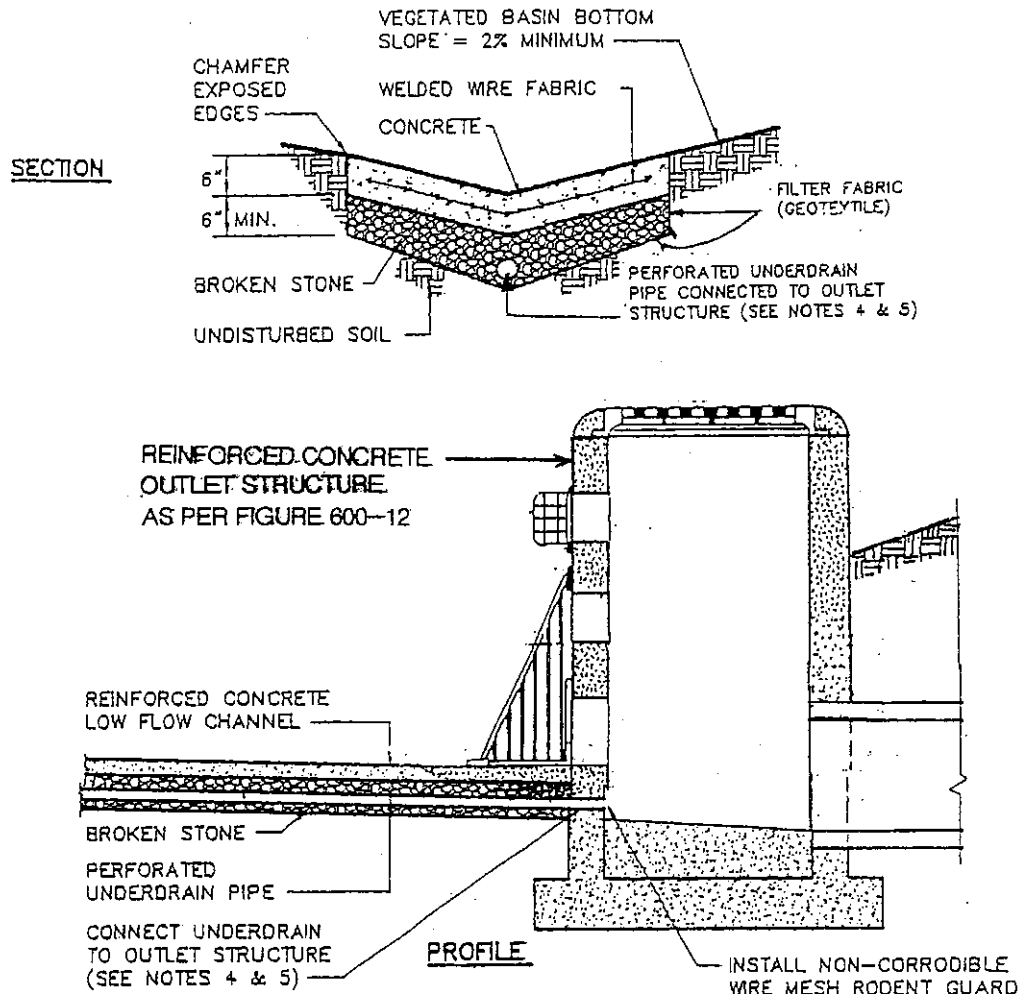


FIGURE 600-13
 Morris County Typical Detail
Multi-Stage Outlet
 Not to Scale 10-95

NOTES:

1. PROVIDE 4"Ø WEEP HOLES IN CONCRETE CHANNEL 12' O.C. (MAX.) OR EVERY 100 S.F. OF LINING (WHICHEVER IS LESS). WEEP HOLES MUST NOT BE DIRECTLY CONNECTED TO ANY LOW FLOW CHANNEL UNDERDRAIN PIPE. PLACE GEOTEXTILE FILTER FABRIC UNDER WEEP HOLES.
2. PROVIDE CONSTRUCTION AND EXPANSION JOINTS IN CONCRETE AT REQUIRED INTERVALS.
3. PROVIDE CUTOFF WALLS AS REQUIRED



4. FOR GABION LINED LOW FLOW CHANNELS, PROVIDE WEEP HOLES IN UPSTREAM FACE OF OUTLET STRUCTURE AT DOWNSTREAM END OF GABION LINING. GABION LINED CHANNEL CAN THEN SERVE AS ITS OWN UNDERDRAIN.
5. WHERE THE RATE OF FLOW THROUGH THE UNDERDRAIN SYSTEM IS A CONCERN RELATIVE TO THE STORM WATER QUALITY CONTROL, THE UNDERDRAIN SYSTEM SHOULD BE DAYLIGHTED UPSTREAM OF THE CONTROL STRUCTURE.

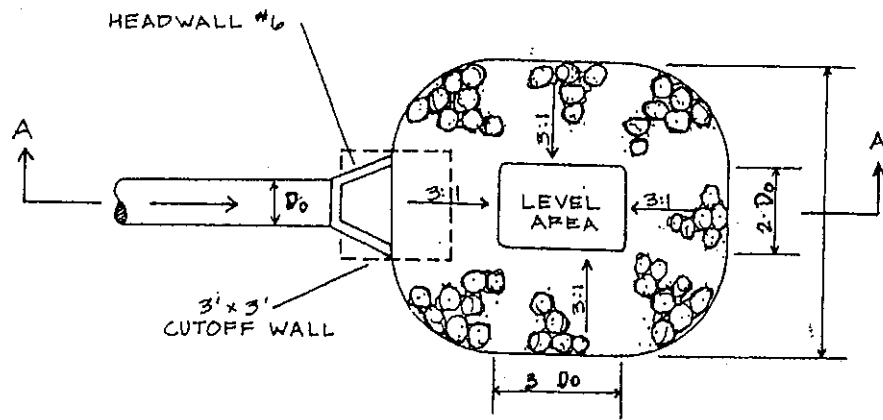
FIGURE 600-14

Morris County Typical Detail
Low Flow Channels

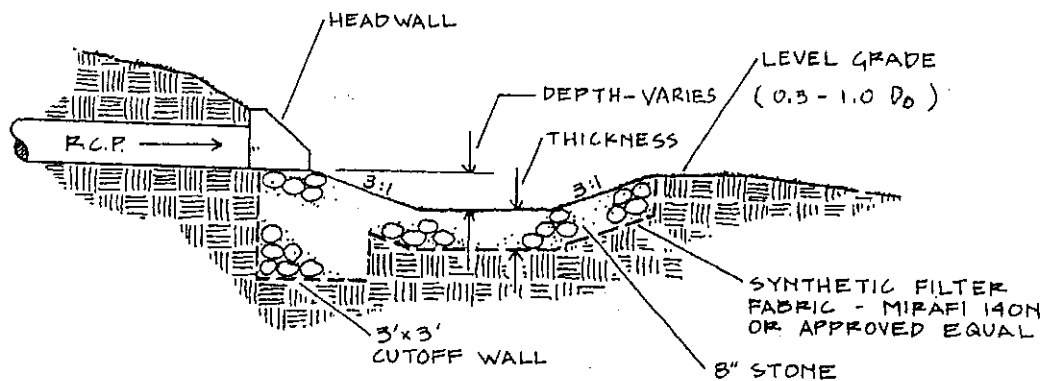
Not to Scale

10-95

SOURCE: NJDEP STORMWATER MANAGEMENT
MAINTENANCE MANUAL; MODIFIED BY MCPB



- PLAN VIEW -



- SECTION A-A -

NOTE: SEE PAGE 4-13, FIGURE 4-4
MORRIS COUNTY STORMWATER
MANAGEMENT TECHNICAL GUIDE

FIGURE 600-15

Morris County Typical Detail
Preformed Scour Hole

Not to Scale

10-95

locations to enable future connections with approved systems or contemplated systems and shall be adequate to handle all present and probable future development.

- B. Character of land. Land which the approving authority finds to be in areas identified in the Natural Resources Inventory as having severe or moderate soil characteristics, particularly as the land relates to flooding, improper drainage, steep slopes, rock formations, soil conditions, adverse topography, utility easements or other features which can reasonably be expected to be harmful to the health, safety and general welfare of the present or future inhabitants of the development and/or its surrounding areas, shall not be subdivided and site plans shall not be approved unless adequate and acceptable methods are formulated by the developer to solve the problems by methods meeting this section and all other regulations.
- C. Plats straddling municipal boundaries. Whenever a development abuts or crosses a municipal boundary, access to those lots within the township shall be from within the township as the general rule. Wherever access to a development is required across land in an adjoining community as the exception, the approving authority may require documentation that such access is legally established and that the access road is adequately improved.
- D. Development name. The proposed name of the development shall not duplicate or too closely approximate the name of any other development in the township. The approving authority shall have final authority to designate the name of the development which shall be determined at the sketch plat stage.

§ 400-74. Surface water management.

- A. Submission of plan required. For all new construction for which a building permit is required, as well as for all soil

removal for which a soil removal permit is required, within the Township of Mount Olive, a surface water management plan must be submitted to the Township Engineer for review and approval as provided for in Subsection D. prior to any commencement of construction.

B. Contents of plan. Every surface water management plan submitted to the Township Engineer shall include the following data:

- (1) The name and address of the applicant.
- (2) The lot and block numbers of the site as shown on the current Township Tax Map.
- (3) The location of the site within the watershed(s) as shown on a topographic map.
- (4) The location and description of significant natural and man-made features on and surrounding the site, including topography, steep slopes, all impervious surfaces, soil and drainage characteristics and presently existing surface water runoff control devices, mechanisms or areas.
- (5) The size of the nearest culvert or storm sewer downstream of the discharge area and the proposed surface water discharge from the site.
- (6) The location and description of any proposed changes to the site, whether of a permanent or temporary nature, with particular attention to impervious surfaces and interception of presently dispersed flow which may affect the capacity of the soil, vegetative cover and drainageways to absorb, retard, contain or control surface water runoff.
- (7) The designation of critical or other areas to be left undisturbed, shown in sufficient detail to be accurately marked and identified on the land.

- (8) The approximate computation of the total surface water runoff before and after the disturbance of land and/or construction of impervious surfaces.
 - (9) Any proposed temporary and permanent surface water management measures.
- C. General guidelines. The surface water management plan shall adhere to the following general principles:
- (1) The rate and velocity from the site following completion of the planned development shall not exceed that which occurred in previous undisturbed ground cover.
 - (2) Maximum use shall be made of presently existing surface water runoff control devices, mechanisms or areas, such as existing berms, terraces, grass waterways, favorable hydrologic soils, swamps, swales, watercourses, woodlands and floodplains, as well as any proposed retention structures.
 - (3) Whenever practicable and when permitted by the zoning provisions of the Land Use Ordinance,²⁹ the construction should aim to reduce the total area of impervious surface and not increase the runoff flow rate.
 - (4) Evaluation shall be made of the nature of the subwatershed(s) of which the site is a part, the receiving stream channel capacities and the points of concentration structure as shown on a township map showing roads, streams, culverts, bridges, Mount Olive Township and the existing drainage Master Plans.
 - (5) To the greatest possible extent, the plan shall avoid the concentration of flow and shall provide for dissipation of velocities at all concentrated discharge points.

²⁹ Editor's Note: See Art. VI, Zoning Provisions, herein.

- (6) Reestablishing vegetation cover shall be in accordance with Standards and Specifications for Soil Erosion and Sediment Control in New Jersey, current edition.
 - (7) The plan shall establish a time schedule for temporary and permanent surface water management measures during construction, to include seeding and establishing sod in grass waterways.
- D. Review of plan. The surface water management plan shall be submitted to the Township Engineer for review and approval. If the applicant is before the Planning Board or Board of Adjustment, the Township Engineer shall report to the appropriate agency whether he approves or disapproves the surface water management plan. The agency may condition its approval of the applicant for site plan, subdivision or variance upon approval by the Township Engineer of the surface water management plan. In the event that the applicant disagrees with the decision of the Township Engineer regarding the surface water management plan, the applicant may take an appeal to the Board before which the application is being considered.
- E. Design standards. The Township Engineer shall utilize the following design standards in reviewing the surface water management plan:
- (1) For calculating runoff and controls, either of the following methods may be used in computing runoff: the Soil Conservation Service Method under the United States Department of Agriculture or the Rational Method.

Parameter Conditions	SCS Method Meadow	Rational Method Average Surface Cultivation or Light Growth [R=(0.20 to 0.40)]
Collection system	25-year storm	25-year storm
Storage	100-year storm	100-year storm
Outlet discharge	10-year storm	10-year storm
Emergency spillway	100-year storm	100-year storm
Soil type	A,B,C,D, as deter- mined by Soil Survey, Morris County, by USDA-SCS, current issue	Id
Maximum velocity at pipe outlets	—	To be determined by velocity at receiv- ing watercourse
Intensity	SCS method	Water Policy rainfall curves

- (2) All outfalls are to be designed in a manner to retard velocities at the outfall and provide stream channel protection.
- (3) When a natural drainage pattern is necessarily intercepted, as by a street, this shall be provided for by proper engineering means.
- (4) All structures and land treatment practices shall conform to Standards and Specifications for Soil Erosion and Sediment Control in New Jersey, current edition.
- (5) All water carrying structures and/or retention areas shall be completed and stabilized prior to diversion of water to them.
- (6) Prior to developing the surface water management plan, there shall be an inventory of the site showing all existing natural and man-made drainage related features. These shall be incorporated in the plan to the greatest possible extent in accordance with their functional capability.

- (7) Drainageways and watercourses which normally carry or receive surface water runoff shall not be overloaded with increased runoff, sediment or other pollution resulting from disturbance of soil and vegetation incident to development, construction or other activity.
 - (8) Due consideration shall be given to the relationship of the subject property to the natural or established drainage pattern of the subwatershed(s) of which it is a part.
 - (9) Innovative surface water runoff control and recharge devices may be proposed, such as rooftop storage, dry wells, cisterns, roof drain infiltration trenches, etc., provided that they are accompanied by detailed engineering plans and performance capabilities.
 - (10) Where deemed necessary for proper evaluation of runoff and control, drainage calculations may be required by the Township Engineer.
- F. Factors to guide plan review. The Township Engineer's review of the surface water management plan shall be guided by but not be limited to the following factors:
- (1) The suitability of the applicant's proposed surface water management measures, devices and planning techniques, whether involving on-site or off-site measures, or some combination thereof, in respect to the total surface water runoff, velocities and rates of discharges which the applicant's proposed construction or land disturbance may generate.
 - (2) Existing topography, present vegetation and soil factors, subject to field verification.
 - (3) Groundwater recharge and discharge areas and wet soils, as shown on the United States Department of Agriculture Soil Conservation Service Map, "Alluvial, Poorly Drained and Somewhat Poorly Drained Soils."

- (4) Groundwater quality, as determined by chemical and biological analysis, as required by the Township Engineer.
- (5) Soil characterization from the surface to the groundwater level.
- (6) The quantity of available groundwater.
- (7) Wastewater disposal and its effect on groundwater quality.
- (8) The seasonal high groundwater table.
- (9) The design storm.
- (10) The natural drainage flows and patterns in the subwatersheds affected by the plan.
- (11) Any existing land uses in both the immediate area and in the surrounding drainage region.
- (12) Any other applicable or relevant environmental and resource protection ordinances in effect.

G. Implementation and enforcement.

- (1) Building permits. No building permit shall be issued by the Building Inspector without an approval of the surface water management plan by the Township Engineer.
- (2) Inspection.
 - (a) The applicant shall bear full and final responsibility for the installation and construction of all required surface water runoff control measures according to the provision of his approved plan and this section. The Township Engineer shall inspect the site during its preparation and development to ensure that all surface water management measures have been constructed in accordance with the provisions of the applicant's approved plan under this section.

- (b) The Township Engineer shall make periodic site visits after project completion to assure that all parts of the plan have been complied with.
 - (3) Certificate of occupancy. No certificate of occupancy shall be issued by the Building Inspector unless and until receipt of a certification by the Township Engineer that the construction complies with the approved surface water management plan.
- H. Special requirements for single-family dwellings. All single-family residential dwellings are exempt from the requirement in this section of submission of a surface water management plan. However, in all such dwellings, house leaders must be connected into an on-site dry well (of sufficient size to handle the discharge from the dwelling), a township drainage facility or a township drainageway approved by the Township Engineer. This section shall in no way be construed as limiting the power of the Board of Adjustment or the Planning Board to require submission of information and/or plans relating to surface water management.
- I. Violations and penalties.
 - (1) Any person violating the provisions of this section shall, upon conviction thereof, be subject to a fine not exceeding \$500 or imprisonment in the county jail for a term not exceeding 90 days, or both.
 - (2) Any person convicted of a violation of any provision of this section shall be liable for the cost of correcting said violation.

§ 400-75. Tree removal, replanting and forestry management plans. [Amended 5-8-2001 by Ord. No. 12-2001]

Tree removal shall be permitted and tree replanting shall be required in all zone districts subject to the provisions of this section.

- D. Use of existing fences or walls. With the exception of fences or walls surrounding in-ground swimming pools, any fence or wall existing at the time of passage of this chapter, which may be in violation of the chapter in respect only to the height and type of fence or wall, may be permitted to be continued.
- E. Violations and penalties. Any person, persons, firm, firms or corporation violating the provisions of this chapter shall, upon conviction thereof, be fined not more than the sum of \$200 or be imprisoned in the county jail for a term not exceeding 30 days, or both, in the discretion of the Judge imposing the sentence; and each day that a violation is permitted to exist shall constitute a separate offense.

§ 400-82. Height. [Amended 3-23-1999 by Ord. No. 7-99]

Mechanical equipment and structures housing such mechanical equipment shall be permitted to extend above maximum heights set forth in this chapter. Freestanding structures which are accessory to the principal permitted use, such as silos, windmills, antennas, communications towers, water storage tanks and flagpoles, shall be permitted to exceed the height limits of the chapter, provided that the structure is not located in the required front yard and is set back from all property lines a minimum of the height of the structures.

§ 400-83.¹ Stream corridor buffers. [Added 12-20-2000 by Ord. No. 49-2000]

- A. Statement of purpose. The purpose of this section is to protect property from flooding; to reduce land development impacts on stream water quality and flows; to protect existing natural drainage features; to protect other's rights within the same watershed from adverse

¹ Editor's Note: Former § 400-83, Historic preservation districts, was repealed 3-23-1999 by Ord. No. 7-99.

effects of improper stream corridor development; and to provide recreation and wildlife migration corridors.

- B. Stream corridor buffers. All residential and nonresidential subdivisions, including minor subdivisions, and all site plans, both residential and nonresidential, shall provide for a stream corridor buffer as part of the development scheme. Stream corridor buffers shall have a width of 100 feet on each side of all stream corridors, and no building or structure, including driveways or parking areas, whether pervious or impervious, shall be erected within any stream corridor or stream corridor buffer. No septic system shall be located within any stream corridor, or stream corridor buffer, and in no case closer than 100 feet of the top of bank of any stream.
- C. Information required. The following information shall be supplied for any development within a stream corridor and buffer. Such information shall be in addition to information required for site plan or subdivision review.
- (1) Delineation of stream corridors and buffers as defined in § 400-6 of this chapter.
 - (2) A plan indicating the disposition of any materials proposed to be deposited or removed by the grading or regrading of land.
 - (3) A demonstration of how suitable techniques, including erosion and soil stabilization measures, sediment traps and nutrient control by vegetation filters or other mechanisms will be incorporated to protect the stream.
- D. Vegetation requirements. Where the lands proposed for development include a portion of the stream corridor, a condition of any major subdivision or major site plan approval shall be the vegetation or revegetation of any portions of the required stream corridor buffer which are not vegetated at the time of the application or which were disturbed by prior land uses, such as agriculture.

The Planning Board shall approve a vegetation plan, which utilizes native tree and plant species.

- E. Drainage and conservation easements. The drainage and conservation easement requirements of this chapter shall be followed in addition to the requirements for stream corridor buffers
- F. Permitted activities. The Planning Board or Zoning Board of Adjustment may permit the following activities within the stream buffer area, subject to review and approval.
 - (1) Recreational use, whether open to the public or restricted to private membership, which is specifically related to the stream corridor and is water dependent.
 - (2) Dams, culverts and bridges that have received approval from the appropriate municipal, county and state agencies having such authority.
- G. Waivers. The Planning Board or Zoning Board of Adjustment may waive the stream corridor buffer requirements of this section if the applicable Board has jurisdiction with respect to site plan, subdivision or bulk variance review and approval. Said waiver(s) must demonstrate good cause, such as, but not limited to, permit additions to existing buildings or structures which are located within the stream corridor or buffer. Waivers granted under this subsection shall be subject to other requirements of this chapter or those of the Morris County Soil Conservation District or the New Jersey Department of Environmental Protection with regard to flood hazard controls, soil erosion control measures, stream encroachment and freshwater wetlands regulations.

- E. Designation of fire lanes. Said fire lanes shall be designated with yellow paint on the pavement and with appropriate signs.
- F. Violations and penalties. Any person, firm or corporation violating the provisions of this section shall, upon conviction, be subject to a fine of not more than \$50.

§ 400-47. Fire protection.

- A. Wherever a central water supply system services or proposes to serve a development, provision shall be made for fire hydrants along streets, within parking areas and/or on the walls of nonresidential structures, as approved by the Township Fire Subcode Official or the Municipal Engineer and in accordance with Fire Insurance Rating Organization Standards. In addition, fire hydrants shall comply with all provisions of § 400-45 of this chapter.
- B. Where streams or ponds exist or are proposed on lands to be developed, facilities shall be provided to draft water for fire-fighting purposes. This shall include access to a public street suitable for use by fire-fighting equipment and construction of or improvements to ponds, dams or similar on-site or off-site development, where feasible. Such facilities shall be constructed to the satisfaction of the Township Engineer and Fire Marshal and in accordance with National Fire Protection Association Standards.

§ 400-48. Flood damage prevention.

- A. Findings of fact.
 - (1) The flood hazard areas of the Township of Mount Olive are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental

services, extraordinary public expenditures for flood protection and relief and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.

- (2) These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazard, which increase flood heights and velocities and, when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated or otherwise protected from flood damage also contribute to the flood loss.

B. Statement of purpose. It is the purpose of this section to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- (1) Protect human life and health.
- (2) Minimize expenditure of public money for costly flood control projects.
- (3) Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public.
- (4) Minimize prolonged business interruptions.
- (5) Minimize damage to public facilities and utilities, such as water and gas mains, electric, telephone and sewer lines, streets and bridges, located in areas of special flood hazard.
- (6) Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas.
- (7) Ensure that potential buyers are notified that property is in an area of special flood hazard.
- (8) Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

- C. Methods of reducing flood losses. In order to accomplish its purposes, this chapter includes methods and provisions for:
- (1) Restricting or prohibiting uses which are dangerous to health, safety and property due to water or erosion hazards or which result in damaging increases in erosion or in flood heights or velocities.
 - (2) Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction.
 - (3) Controlling the alteration of natural floodplains, stream channels and natural protective barriers which help accommodate or channel floodwaters.
 - (4) Controlling filling, grading, dredging and other development which may increase flood damage.
 - (5) Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.
- D. Lands to which this chapter applies. This chapter shall apply to all areas of special flood hazard within the jurisdiction of the Township of Mount Olive.
- E. Basis for establishing areas of special flood hazard. The areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled "The Flood Insurance Study for the Township of Mount Olive," dated August 1983, with accompanying Flood Insurance Rate Maps and Flood Boundary and Floodway Maps and any revisions thereto, are hereby adopted by reference and declared to be a part of this section. The Flood Insurance Study is on file in the Mount Olive Township Municipal Building, Route 46, Mount Olive, New Jersey.
- F. Penalties for noncompliance. No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of this

section and other applicable regulations. Violation of the provisions of this section by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a misdemeanor. Any person who violates this section or fails to comply with any of its requirements shall, upon conviction thereof, be fined not more than five hundred dollars (\$500.) or imprisoned for not more than 90 days, or both, for each violation and, in addition, shall pay all costs and expenses involved in the case. Nothing herein contained shall prevent the Township of Mount Olive from taking such other lawful action as is necessary to prevent or remedy any violation.

- G. Abrogation and greater restrictions. This section is not intended to repeal, abrogate or impair any existing easements, covenants or deed restrictions. However, where this section and any other ordinance, easement, covenant or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.
- H. Interpretation. In the interpretation and application of this section, all provisions shall be :
 - (1) Considered as minimum requirements.
 - (2) Liberally construed in favor of the governing body.
 - (3) Deemed neither to limit nor repeal any other powers granted under state statutes.
- I. Warning and disclaimer of liability. The degree of flood protection required by this section is considered reasonable for regulatory purposes and is based on scientific and engineering consideration. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes; this section does not imply that land outside the areas of special flood hazard or uses permitted within such areas will be free from flooding or flood damages. This section shall not create liability on the part of the Township of Mount

Olive, any officer or employee thereof or the Federal Insurance Administration for any flood damages that result from reliance on this section or any administrative decision lawfully made thereunder.

J. Administration.

- (1) Establishment of development permit. A development permit shall be obtained before construction or development begins within any area of special flood hazard established in Subsection E. Application for a development permit shall be made on forms furnished by the Planning Official and may include, but not be limited to, plans in duplicate, drawn to scale, showing the nature, location, dimensions and elevations of the area in question, existing or proposed structures, fill, storage of materials, drainage facilities and the location of the foregoing. Specifically, the following information is required:
 - (a) The elevation, in relation to mean sea level, of the lowest floor (including the basement) of all structures.
 - (b) The elevation, in relation to mean sea level, to which any structure has been floodproofed.
 - (c) Certification by a registered professional engineer or architect that the floodproofing methods for any nonresidential structure meet the floodproofing criteria in Subsection K.
 - (d) A description of the extent to which any watercourse will be altered or relocated as a result of proposed development.
- (2) Designation of the Planning Official. The Planning Official is hereby appointed to administer and implement this section by granting or denying development permit applications in accordance with its provisions.

- (3) Duties and responsibilities of the Planning Official. The duties of the Planning Official shall include, but not be limited to:
 - (a) Permit review. The Planning Official shall:
 - [1] Review all development permits to determine that the permit requirements of this section have been satisfied.
 - [2] Review all development permits to determine that all necessary permits have been obtained from those federal, state or local governmental agencies from which prior approval is required.
 - [3] Review all development permits to determine if the proposed development is located in the floodway. If located in the floodway, assure that the encroachment provisions of Subsection K are met.
 - (b) Use of other base flood data. When base flood elevation and floodway data have not been provided in accordance with Subsection E, "Basis for establishing areas of special flood hazard," the local administrator shall obtain, review and reasonably utilize any base flood elevation and floodway data available from a federal, state or other source in order to administer specific standards, residential construction, and specific standards, nonresidential construction, as set forth in Subsection K.
 - (c) Information to be obtained and maintained. The Planning Official shall:
 - [1] Obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including the basement) of all new or substantially improved structures and

whether or not the structure contains a basement.

- [2] For all new and substantially improved floodproofed structures:
 - [a] Verify and record the actual elevation (in relation to mean sea level); and
 - [b] Maintain the floodproofing certifications required in Subsection J(1)(c).
- [3] Maintain for public inspection all records pertaining to the provisions of this section.
- (d) Alteration of watercourses. The Planning Official shall:
 - [1] Notify adjacent communities and the state coordinating agency prior to any alteration or relocation of a watercourse and shall submit evidence of such notification to the Federal Insurance Administration.
 - [2] Require that maintenance is provided within the altered or relocated portion of said watercourse so that the flood-carrying capacity is not diminished.
- (e) Interpretation of FIRM boundaries. The Planning Official shall make interpretations, where needed, as to the exact location of the boundaries of the areas of special flood hazard (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). For the purpose of making interpretations, the Planner shall make a field inspection to determine field conditions. The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in Subsection J(4).

(4) Variance procedure.

(a) Appeal Board.

- [1] The Planning Board or the Zoning Board of Adjustment as established by the Township of Mount Olive shall hear and decide appeals and requests for variances from the requirements of this section.
- [2] The Planning Board or the Zoning Board of Adjustment shall hear and decide appeals when it is alleged there is an error in any requirement, decision or determination made by the Construction Official in the enforcement or administration of this section.
- [3] Those aggrieved by the decision of the Planning Board or the Zoning Board of Adjustment or any taxpayer may appeal such decision to the Superior Court of New Jersey, as provided by law.
- [4] In passing upon such applications, the Planning Board or the Zoning Board of Adjustment shall consider all technical evaluations, all relevant factors, standards specified in other subsections of this section and:
 - [a] The danger that materials may be swept onto other lands to the injury of others.
 - [b] The danger to life and property due to flooding or erosion damage.
 - [c] The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner.

- [d] The importance of the services provided by the proposed facility to the community.
 - [e] The necessity to the facility of a waterfront location, where applicable.
 - [f] The availability of alternative locations for the proposed use, which are not subject to flooding or erosion damage.
 - [g] The compatibility of the proposed use with existing and anticipated development.
 - [h] The relationship of the proposed use to the Comprehensive Plan and floodplain management program of the area.
 - [i] The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water systems and streets and bridges.
- [5] Upon consideration of the factors of Subsection J(4)(a)[4] and the purposes of this section, the Planning Board or the Zoning Board of Adjustment may attach such conditions to the granting of variances as it deems necessary to further the purposes of this section.
- [6] The Planning Official shall maintain the records of all appeal actions, including technical information, and report any variances to the Federal Insurance Administration upon request.

(b) Conditions for variances.

- [1] Generally, variances may be issued for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, provided that Subsection J(4)(a)[4][a] through [i] has been fully considered. As the lot size increases beyond one-half (1/2) acre, the technical justification required for issuing the variance increases.
- [2] Variances may be issued for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or the State Inventory of Historic Places, without regard to the procedures set forth in the remainder of this section.
- [3] Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.
- [4] Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
- [5] Variances shall only be issued upon:
 - [a] A showing of good and sufficient cause.
 - [b] A determination that failure to grant the variance would result in exceptional hardship to the applicant.
 - [c] A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety or extraordinary public expense or create nuisances or cause

fraud on or victimization of the public, as identified in Subsection J(4)(a)[4], or conflict with existing local laws or ordinances.

- [6] Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with a lowest floor elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

K. Provisions for flood hazard reduction.

- (1) General standards. In all areas of special flood hazard, the following standards are required:

- (a) The Planning Board or the Zoning Board of Adjustment shall also determine, with the advice and assistance of the Township Engineer, Construction Official and other competent authority that:

- [1] Proposed construction, repairs or alterations shall use construction materials and utility equipment that are resistant to flood damage. Proposed construction, repairs or alterations shall be designed (or modified) and adequately anchored to prevent flotation, collapse or lateral movement of the structure.
- [2] Construction methods and practices are used that will resist rupture or collapse from water pressure and minimize flood damage.
- [3] Proposed utilities and facilities, such as water, sewer and electrical systems, are located, elevated and constructed to minimize or eliminate flood damage. These

shall include watertight manholes with vents, raised vents, flap valves, etc. Such facilities shall be constructed with overflow elevations two (2) feet above flood level. In addition, on-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

- [4] Drainage is provided to reduce exposure to flood hazards.
- [5] New or replacement water systems and sanitary sewer systems are designed and located to prevent infiltration, leakage, impairment or contamination during flooding.
- [6] Doors shall be of watertight installation.
- [7] Paints, membranes or mortars shall be used to reduce seepage of water through walls.
- [8] Backfill should be of soils with natural low permeability.
- [9] There shall be eight (8) inches of compacted granular fill beneath ground floor, said fill materials acting as a french drain.
- [10] No buried fuel oil tanks shall be permitted unless properly anchored and vented, with the vent two (2) feet above the flood level.
- [11] All mechanical devices and equipment subject to water damage, including furnaces and electrical distribution centers, shall be located at least two (2) feet above flood level.

(b) Anchoring.

- [1] All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure.
- [2] All manufactured homes shall be anchored to resist flotation, collapse or lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable state and local anchoring requirements for resisting wind forces.
 - [a] Over-the-top ties shall be provided at each of the four (4) corners of the mobile home, with two (2) additional ties per side at intermediate locations, with mobile homes less than fifty (50) feet long requiring one (1) additional tie per side.
 - [b] Frame ties shall be provided at each corner of the home, with five (5) additional ties per side at intermediate points, with mobile homes less than fifty (50) feet long requiring four additional ties per side.
 - [c] All components of the anchoring system shall be capable of carrying a force of four thousand eight hundred (4,800) pounds.
 - [d] Any additions to the mobile home shall be similarly anchored.

(c) Construction materials and methods.

- [1] All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

- [2] All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.

(d) Utilities.

- [1] All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.
- [2] New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharge from the systems into floodwaters.
- [3] On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.
- [4] Electrical, heating, ventilation, plumbing and air-conditioning equipment and other service facilities shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

(e) Subdivision proposals.

- [1] All subdivision proposals shall be consistent with the need to minimize flood damage.
- [2] All subdivision proposals shall have public utilities and facilities, such as sewer, gas, electrical, and water systems, located and constructed to minimize flood damage.
- [3] All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage.

- [4] Base flood elevation data shall be provided for subdivision proposals and other proposed development which contain at least fifty (50) lots or five (5) acres (whichever is less).
- (f) For all new construction and substantial improvements, fully enclosed areas below the lowest floor that are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria: A minimum of two (2) openings having a total net area of not less than one (1) square inch for every square foot of enclosed area subject to flooding shall be provided. The bottom of all openings shall be no higher than one (1) foot above grade. Openings may be equipped with screens, louvers or other coverings or devices, provided that they permit the automatic entry and exit of floodwaters.
- (2) Specific standard. In all areas of special flood hazard where base flood elevation data have been provided as set forth in Subsection E, Basis for establishing areas of special flood hazard or in Subsection J(3)(b), Use of other base flood data, the following standards are required:
 - (a) Residential construction. New construction and substantial improvement of any residential structure shall have the lowest floor, including the basement, elevated to or above base flood elevation.
 - (b) Nonresidential construction. New construction and substantial improvement of any commercial, industrial or other nonresidential

structure shall either have the lowest floor, including the basement, elevated to the level of the base flood elevation or, together with attendant utility and sanitary facilities, shall:

- [1] Be floodproofed so that below the base flood level the structure is watertight, with walls substantially impermeable to the passage of water.
- [2] Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.
- [3] Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting the applicable provisions of this section. Such certification shall be provided to the official as set forth in Subsection J(3)(c)[2].

(c) Mobile homes.

- [1] Mobile homes shall be anchored in accordance with Subsection K(1)(b)[2].
- [2] All manufactured homes to be placed or substantially improved within an area of special flood hazard shall be elevated on a permanent foundation such that the top of the lowest floor is at or above the base flood elevation.
 - [a] Stands or lots shall be elevated on compacted fill or on pilings so that the lowest floor of the mobile home will be at or above the base flood level.
 - [b] Adequate surface drainage and access for a house shall be provided.
 - [c] In the instance of elevation on pilings:

- [i] Lots shall be large enough to permit steps.
 - [ii] Piling foundations shall be placed in stable soil, no more than ten (10) feet apart.
 - [iii] Reinforcement is provided for pilings more than six (6) feet above the ground level
- (3) Floodways. Located within areas of special flood hazard established in Subsection E are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles and erosion potential, the following provisions apply:
 - (a) Encroachments, including fill, new construction, substantial improvements and other development shall be prohibited unless a technical evaluation demonstrates that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.
 - (b) If Subsection K(3)(a) above is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of Subsection K, Provisions for flood hazard reduction.
 - (c) The placement of any mobile homes, except in an existing mobile home park or existing mobile home subdivision, shall be prohibited.
 - (d) In all areas of special flood hazard in which base flood elevation data have been provided and no floodway has been designated, the cumulative effect of any proposed development, when combined with all other existing and anticipated development, shall not increase the

water surface elevation of the base flood more than two-tenths ($\frac{2}{10}$) of a foot at any point.

§ 400-49. Floodplain construction.

A. Purpose and policy. It is hereby found that Drakes Brook, Turkey Brook, South Branch Raritan River and Musconetcong River in the Township of Mount Olive are subject to recurring flooding; that such flooding damages and endangers life and public and private property and facilities; that this condition is aggravated by development and encroachment in the floodplain; and that the most appropriate method of alleviating such conditions is through regulation of such development and encroachment. It is, therefore, determined that the special and paramount public interest in the floodplain justifies the regulation of property therein for the protection of the persons and property of its inhabitants and for the preservation of the public health, safety and general welfare through the exercise of the police power of the municipality.

B. Content.

- (1) This section consists of this text and those maps entitled:
 - (a) "State of New Jersey Department of Conservation and Economic Development, Division of Water Policy and Supply, Delineation of Floodway and Flood Hazard Areas, Drakes Brook, Mount Olive Township, Morris County, New Jersey, Anderson-Nichols & Co., Boston, Massachusetts." Plate Numbers D-1 through D-4.
 - (b) "State of New Jersey Department of Conservation and Economic Development, Division of Water Policy and Supply, Delineation of Floodway and Flood Hazard Area, South Branch Raritan River, Mount Olive

LITTERING

Chapter 150

LITTERING

- § 150-1. Title.
- § 150-2. Definitions and word usage.
- § 150-3. Litter in public places.
- § 150-4. Placement in receptacles; provision of receptacles at commercial establishments.
- § 150-5. Sweeping into gutters prohibited; maintenance of sidewalks.
- § 150-6. Maintenance of sidewalks in front of business property.
- § 150-7. Maintenance of area around recycle bins.
- § 150-8. Litter from vehicles.
- § 150-9. Litter in parks.
- § 150-10. Litter in bodies of water.
- § 150-11. Distributing handbills in public places.
- § 150-12. Placing handbills on vehicles.
- § 150-13. Distributing handbills on private premises.
- § 150-14. Dropping litter from aircraft.
- § 150-15. Litter on vacant lots.
- § 150-16. Clearing of litter from open private property.
- § 150-17. Responsibility for providing and servicing receptacles.
- § 150-18. Violations and penalties.
- § 150-19. Enforcement.

[HISTORY: Adopted by the Mayor and Council of the Township of Mount Olive 8-23-1988 as Ord. No. 34-88. Section 150-18 amended at time of adoption of Code; see Ch. 1, General Provisions, Art. I. Other amendments noted where applicable.]

GENERAL REFERENCES

Parks — See Ch. 176.
Property maintenance — See Ch. 185.
Solid waste disposal — See Ch. 211.
Streets and sidewalks — See Ch. 215.
Solid waste transfer stations — See Ch. 315.

§ 150-1. Title.

This chapter shall be known and may be cited as the "Litter Ordinance of the Township of Mount Olive."

§ 150-2. Definitions and word usage.

- A. When not inconsistent with the context, words used in the present tense include the future, words used in the plural number include the singular number, and words used in the singular number include the plural number. The word "shall" is always mandatory and not merely directory.
- B. For the purposes of this chapter, the following terms, phrases, words and their derivations shall have the meanings given herein:

AIRCRAFT — Any contrivance now known or hereafter invented, used or designated for navigation or for flight in the air. The word "aircraft" shall include helicopters and lighter-than-air dirigibles and balloons.

BOAT — Any craft designed to be occupied by one (1) or more persons and used on, in or under water.

GARBAGE — Putrescible animal and vegetable wastes resulting from the handling, preparation, cooking and consumption of food.

HANDBILL — Any printed or written matter, any sample or device, dodger, circular, leaflet, pamphlet, newspaper, magazine, paper, booklet or any other printed or otherwise reproduced original or copies of any matter of literature not included in the definition of a newspaper.

LITTER — Any used or unconsumed substance or waste material which has been discarded, whether made of aluminum, glass, plastic, rubber, paper or other natural or synthetic material, or any combination thereof, including but not limited to any bottle, jar or can or any top, cap or detachable tab of any bottle, jar or can; any unlighted cigarette, cigar, match or any flaming or glowing material; or any garbage, trash, refuse, debris, rubbish, grass clippings or other lawn or garden waste; newspaper, magazines, glass, metal, plastic or paper containers, or other packaging or construction material; but does not include the waste of the primary processes of mining or other extraction processes, logging, saw milling, farming or manufacturing. [Amended 6-29-1993 by Ord. No. 15-93]

NEWSPAPER — Any newspaper of general circulation as defined by general law, any newspaper duly entered with the United States Postal Service in accordance with federal statute or regulation and any newspaper filed and recorded with any recording officer as provided by general law and, in addition thereto, includes any periodical or current magazine regularly published with not fewer than four (4) issues per year and sold to the public.

PARK — A park, reservation, playground, beach, recreation center or any other public area in the township owned or used by the township and devoted to active or passive recreation.

PERSON — Any person, firm, partnership, association, corporation, company or organization of any kind.

PRIVATE PREMISES — Any dwelling, house, building or other structure designed or used, either wholly or in part, for private residential purposes, whether inhabited or temporarily or continuously uninhabited or vacant, and includes any yard, grounds, walk, driveway, porch, steps, vestibule or mailbox belonging or appurtenant to such dwelling, house, building or other structure.

PUBLIC PLACE — Any and all streets, sidewalks, boulevards, alleys or other public ways and any and all public parks, squares, spaces, grounds, buildings and bodies of water.

RECYCLE BIN — A container designed and utilized for the accumulation of recyclable materials, such as glass, newspaper, cardboard and aluminum cans.

REFUSE — All putrescible and nonputrescible solid wastes (except body wastes), including but not limited to garbage, rubbish, ashes, street cleanings, dead animals, abandoned automobiles and solid market and industrial wastes.

RUBBISH — Nonputrescible solid wastes, consisting of both combustible and noncombustible wastes, such as paper, wrappings, cigarettes, cardboard, tin cans, yard clippings, leaves, wood, glass, bedding, crockery and similar materials.

TOWNSHIP — The Township of Mount Olive.

VEHICLE — Every device in, upon or by which any person or property is or may be transported or drawn upon a highway, including devices used exclusively upon stationary rails or tracks.

§ 150-3. Litter in public places. [Amended 6-29-1993 by Ord. No. 15-93]

It is unlawful for any person, partnership, corporation, firm or other entity to throw, drop, discard or otherwise place litter

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of any nature upon any public or private property, other than in a litter receptacle.

§ 150-4. Placement in receptacles; provision of receptacles at commercial establishments.

- A. Persons placing litter in public receptacles or in authorized private receptacles shall do so in such a manner as to prevent it from being carried or deposited by the elements upon any street, sidewalk or other public place or upon private property.
- B. Commercial establishments which sell food directly to the public shall provide receptacles for disposing of litter inside and outside such establishment.

§ 150-5. Sweeping into gutters prohibited; maintenance of sidewalks.

- A. No person shall sweep into or deposit in any gutter, street or other public place within the township the accumulation of

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litter from any building or lot or from any public or private sidewalk or driveway.

- B. Persons owning or occupying property shall keep the sidewalk in front of their premises free of litter.

§ 150-6. Maintenance of sidewalks in front of business property.

No person owning or occupying a place of business shall sweep into or deposit in any gutter, street or other public place within the township the accumulation of litter from any building or lot or from any public or private sidewalk or driveway. Persons owning or occupying places of business within the township shall keep the sidewalk in front of their business premises free of litter.

§ 150-7. Maintenance of area around recycle bins.

No person owning a recycle bin shall sweep into or deposit in any gutter, street or other public place within the township the accumulation of litter from any building or lot or from any public or private sidewalk or driveway. Persons owning a recycle bin shall keep the sidewalk and immediate area within fifty (50) feet of the recycle bin free of all litter. Owners of recycle bins shall notify the Township Department of Health, Welfare and Sanitation of the owner's name, address and telephone number upon initial installation of such a bin and, thereafter, upon any change in ownership.

§ 150-8. Litter from vehicles.

No person shall drive or move any truck or other vehicle within the township unless such vehicle is so constructed or loaded as to prevent any load, contents or litter from being blown or deposited upon any street, alley or other public place.

§ 150-9. Litter in parks.

No person shall throw or deposit litter in any park within the township, except in public receptacles and in such a manner that the litter will be prevented from being carried or deposited by the elements upon any part of the park or upon any street or other public place. Where public receptacles are not provided, all such litter shall be carried away from the park by the person responsible for its presence, and properly disposed of elsewhere as provided herein.

§ 150-10. Litter in bodies of water.

No person shall throw, sweep or deposit litter in any fountain, pond, lake, stream or any other body of water in a park or elsewhere within the township.

§ 150-11. Distributing handbills in public places.

No person shall throw or deposit any handbill in or upon any sidewalk, street or other public place within the township. This chapter does not restrict any person's constitutional right to distribute handbills in any public place to persons willing to accept them.

§ 150-12. Placing handbills on vehicles.

No person shall throw or deposit any handbill in or upon any vehicle; provided, however, that it shall not be unlawful in any public place for a person to hand out or distribute, without charge to the receiver thereof, a handbill to any occupant of a vehicle who is willing to accept it.

§ 150-13. Distributing handbills on private premises.

No person shall throw, deposit or distribute any handbill, advertisement or other writing upon any private premises if requested by anyone thereon not to do so or if there is placed on said premises in a conspicuous position near the entrance thereof a sign bearing the words "No Trespassing," "No Peddlers or Agents," "No Advertisement" or any similar notice indicating, in any manner, that

the occupants of said premises do not desire to be molested or have their right of privacy disturbed or to have any such handbills left upon such premises.

§ 150-14. Dropping litter from aircraft.

No person in an aircraft shall throw out, drop or deposit within the township any litter, handbill or any other object.

§ 150-15. Litter on vacant lots.

No person shall throw or deposit litter on any open or vacant private property within the township, whether owned by such person or not.

§ 150-16. Clearing of litter from open private property.

- A. Notice to remove. Any Department of Health, Welfare and Sanitation employee is hereby authorized and empowered to notify the owner of any open or vacant private property within the township or the agent of such owner to properly dispose of litter located on such owner's property, which is dangerous to public health, safety or welfare. Such notice shall be by certified mail, return receipt requested, addressed to said owner at his last known address.
- B. Action upon noncompliance. Upon the failure, neglect or refusal of any owner or agent so notified to properly dispose of litter dangerous to the public health, safety or welfare within ten (10) days after receipt of written notice provided for in Subsection A above or within ten (10) days after the date of such notice in the event that the same is returned to the Township Post Office Department because of its inability to make delivery thereof, provided that the same was properly addressed to the last known address of such owner or agent, the Health Department employee is hereby authorized and empowered to pay for the disposing of such litter or to order its disposal by the township.

- C. Charge included in tax bill. When the township has effected the removal and disposal of such dangerous litter or has paid for its removal and disposal, the actual cost thereof, plus accrued interest at the rate of twelve percent (12%) per annum from the date of the completion of work, if not paid by such owner prior thereto, shall operate as a municipal lien on the property.

§ 150-17. Responsibility for providing and servicing receptacles.
[Added 12-19-1989 by Ord. No. 38-89]

Proprietors of the following places or sponsors of the following events shall be responsible for providing and servicing receptacles for litter so that adequate containerization is available: pedestrian walkways; shopping malls; active retail commercially zoned areas such that, at a minimum, there shall be no single linear quarter-mile without a receptacle; buildings held out for use by the public, including schools, government buildings and railroad and bus stations; parks; drive-in restaurants; all street-vendor locations; self-service refreshment areas; construction sites; gasoline service station islands; shopping centers; parking lots; campgrounds and trailer parks; marinas, boat moorage and fueling stations; boat-launching areas; public and private piers operated for public use; beaches and bathing areas; and at special events to which the public is invited, including sporting events, parades, carnivals, circuses and festivals.

§ 150-18. Violations and penalties.¹

Any person, firm or corporation who violates any provision of this chapter shall, upon conviction thereof, be punishable by one (1) or more of the following: by imprisonment for a term not exceeding ninety (90) days or by a fine not exceeding one thousand dollars (\$1,000.) or by a period of community service not exceeding ninety (90) days.

¹ Editor's Note: Amended at time of adoption of Code; see Ch. 1, General Provisions, Art. I.

§ 150-19

LITTERING

§ 150-19

§ 150-19. Enforcement.

This chapter may be enforced by any employee of the Board of Health or any member of the Police Department.

SOLID WASTE DISPOSAL

Chapter 211

SOLID WASTE DISPOSAL; RECYCLABLE MATERIALS

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[HISTORY: Adopted by the Mayor and Council of the Township of Mount Olive 8-17-1993 as Ord. No. 24-93.¹ Amendments noted where applicable.]

GENERAL REFERENCES

Littering — See Ch. 150.
Solid waste transfer station — See Ch. 315.

¹ Editor's Note: This ordinance superseded former Ch. 211, Solid Waste Disposal; Art. I, adopted 8-10-1982 as Ord. No. 10-82 (Ch. 77C of the 1973 Code); Art. II, 5-24-1988 as Ord. No. 23-1988, amended in its entirety 9-10-1991 by Ord. No. 24-91; Art. III, 8-8-1989 as Ord. No. 22-89; Art. IV, 12-19-1989 as Ord. No. 36-89; Art. V, 6-26-1990 as Ord. No. 25-90.

ARTICLE I
Recyclable Materials

§ 211-1. Definitions. [Amended 9-27-1994 by Ord. No. 13-94; 10-10-1995 by Ord. No. 32-95]

As used in this Article, the following terms shall have the meanings indicated:

ALUMINUM BEVERAGE CONTAINERS — Cans of one-piece seamless construction, made entirely of aluminum.

ANTIFREEZE — An automotive engine coolant consisting of a mixture of ethylene glycol and water or propylene glycol and water.

ASPHALT ROOFING SHINGLES — Building materials used to cover the roof or sides of a building in which the material consists of petroleum and/or coal/tar substances.

AUTOMOTIVE BATTERIES — Batteries used to power motor vehicle engines, including those for automobiles, trucks and boats.

CONSTRUCTION AND DEMOLITION DEBRIS — Recyclable components of the construction/demolition waste stream, including but not limited to concrete, brick, concrete and cinder block, asphalt-based roofing scrap, paving material (concrete asphalt and stones), non-chemically treated wood waste, wood pallets and heavy iron (structural steel or ferrous metal and cast-iron components).

CORRUGATED CARDBOARD — Alternating ridged and grooved heavy paper stock used in manufacturing of boxes and shipping containers, excluding foreign corrugated.

GLASS BOTTLES AND JARS — All products made from silica or sand, soda ash and limestone, the product being transparent or translucent and being used for the

packaging or bottling of various matter and all other material commonly known as "glass," excluding, however, blue and flat glass commonly known as "window glass," ceramics, light bulbs and fluorescent tubes.

HOUSEHOLD AND COMMERCIAL BATTERIES — Household batteries composed of alkaline, carbon zinc and zinc air in the following sizes: AAA, AA, 9-volt lantern batteries, C, D and button cell batteries and commercial batteries composed of mercury, silver oxide and lithium batteries.

MAGAZINES/ADVERTISING SUPPLEMENTS — Periodicals made of glossy-type paper.

MIXED PAPER — Junk mail, envelopes, coupons, NCR paper, direct mail ads, fax paper, manila file folders and pendaflex folders.

MOTOR OIL — A petroleum-based or synthetic oil limited to lubrication of internal-combustion engines.

OFFICE PAPER — Bond paper, letterhead paper, photocopy paper, memo paper, colored paper and computer paper.

OIL FILTERS — A filter to screen out impurities from the motor oil of automobiles and trucks.

PERSONS — All individuals, partnerships, corporations, owners, tenants, lessees, occupants, associations and organizations residing, owning or operating, managing, leasing or occupying any premises or business, commercial or industrial, or engaged in the collection or disposal of solid waste and other refuse matter within the Township of Mount Olive. This definition includes commercial buildings such as apartment buildings, hotels, office buildings, restaurants, taverns, supermarkets, etc., and institutions such as schools and hospitals.

PETROLEUM-CONTAMINATED SOIL — Nonhazardous soils containing petroleum hydrocarbons resulting from spills, leaks or leaking underground storage tanks used for gasoline or any other commercial fuel.

PLASTIC BOTTLES — All plastic bottles other than those which contain motor oil or other automotive additives or products. Recyclable plastics can be identified by a logo located on the container with number 1, 2 or 3 within it.

RECYCLABLES — All items of solid waste which are required by this Article to be separated from all other solid waste so as to be collected apart from the ordinary solid waste stream. Residents shall use separate recycling containers for each type of recyclable.

SOLID WASTE — Includes garbage and rubbish normally placed at the curb by all persons residing in Mount Olive Township and received for regular municipal collection.

STEEL CONTAINERS — Rigid containers for food which are constructed of steel or tin.

STORAGE TANKS — Any large receptacle used to hold fluids or gases, including but not limited to oil, gasoline or propane.

STUMPS, LOGS AND TREE PARTS — Unfinished wood from land clearing consisting of stumps, logs and tree parts.

TIRES — All passenger and automobile and truck tires.

USED NEWSPAPER — Paper of the type commonly referred to as "newsprint," but does not include magazines, periodicals, books, paper bags and such other paper products.

WHITE GOODS — All large appliances such as washing machines, dryers, refrigerators/freezers and

stoves/ranges. Chlorofluorocarbons (CFC) contained in certain "white goods" shall not be released into the atmosphere but shall be recovered by persons in accordance with acceptable standards for CFC recovery.

YARD WASTE OTHER THAN THAT RESULTING FROM LAWN MOWING — Vegetative matter generated from the process of yard or ground maintenance, including leaves, limbs and brush no longer than four (4) feet in length.

YARD WASTE RESULTING FROM LAWN MOWING — All grass, weeds, clover or other residual vegetative matter generated from the process of lawn mowing or lawn maintenance.

§ 211-2. Separation and collection. [Amended 9-27-1994 by Ord. No. 13-94]

- A. It shall be mandatory for all persons, except the handicapped or disabled, to separate recyclables from all other solid waste produced in or disposed of by such residential or nonresidential occupants.
- B. Recycling goals. Mount Olive Township will implement such programs so as to achieve the state policy directive of reaching a fifty-percent recycling rate of municipal solid waste by 1995.
- C. Recyclable items are hereby declared to be aluminum beverage containers, antifreeze, automotive batteries, construction and demolition debris, glass bottles and jars, household and commercial batteries, mixed paper, magazines, plastic bottles, used newspapers, motor oil and oil filters, corrugated office paper, steel/tin food containers, stumps, logs and tree parts, tires, white goods, used storage tanks, yard waste resulting from lawn mowing and yard waste other than that resulting from lawn mowing, chipboard and/or greyboard. All mandated recyclable material shall be banned from the Morris County disposal system, which includes the

transfer station facilities and out-of-state landfills. [Note: Asphalt shingles shall continue to be delivered to the transfer station site for recycling, not disposal.] [Amended 10-10-1995 by Ord. No. 32-95; 11-28-1995 by Ord. No. 34-95]

- D. On dates established on an annual basis by the Township, said recyclables, except commercial and demolition debris, household and commercial batteries, stumps, logs and tree parts, white goods and storage tanks, shall be placed at curbside for collection by the Township municipal trucks or by such agent or certain designated firms specifically authorized by the Township to make such collection. The above-mentioned items, with the exception of yard waste resulting from lawn mowing, shall be picked up with special arrangement, as in bundles not exceeding 10 pounds in weight (and 12 inches in height). Yard waste other than yard waste resulting from lawn mowing shall be bagged in paper bags as approved by the Township or placed in a clean trash container. No container or bag shall be of such volume or weight as to exceed 34 gallons or 40 pounds. Limbs and brush shall be bundled and shall be no longer than four feet in length. Corrugated cardboard shall be flattened, tied and put out for collection only in a dry condition. Corrugated cardboard shall not be more than 12 inches high. Magazines, mixed paper and office paper shall be bundled and tied. Aluminum beverage containers, steel/tin food containers, glass bottles and jars and plastic containers shall be placed in a separate recycling container as specified by the Director of the Department of Public Works. Antifreeze shall be placed in sealed plastic jugs. Automobile batteries shall be set out separately on the curb. Household batteries may be brought to the Recycling Center, Municipal Building or the Health Department or placed in a ziplock plastic bag at the curb. Commercial batteries shall be brought or sent to recycling facilities in New Jersey approved and licensed by the New Jersey Department of Environmen-

tal Protection or sent to state facilities approved and licensed by the United States Environmental Protection Agency (USEPA). Shipment or transport of such batteries shall be in accordance with all USEPA regulations. Tires shall be placed separately on the curb with a sticker purchased from the Health Department. Motor oil shall be sealed in plastic jugs, where the motor oil has been generated from automobiles, trucks and lawn mowers. Oil filters shall be placed in plastic bags or ziplock bags. White goods shall be placed on the curb with a purchased sticker from the Health Department. Such items are subject to the regulations regarding collection promulgated by the Director of the Department of Public Works, pursuant to § 211-3, Enforcement; modification to regulations. [Amended 10-10-1995 by Ord. No. 32-95; 3-25-1997 by Ord. No. 13-97; 9-25-2001 by Ord. No. 20-2001]

- E. Where used newspapers are used to wrap solid waste, they may be discarded or disposed of for collection with usual solid waste.
- F. It shall be both mandatory and a condition precedent to the issuance of any permanent certificate of occupancy or final work inspection for the owner of the property, agent or contractor in charge of a construction or demolition site to recycle and source-separate all applicable construction or demolition debris components, including asphalt roofing shingles, as defined, resulting from a construction or demolition project. The construction or demolition debris shall be brought to a state-approved recycling center, and written documentation of the total amount of material recycled during the previous calendar year shall be provided to Mount Olive Township by February 1 of each year. No permit for construction or demolition shall be approved until an origin and destination form¹ is completed and submitted with the permit application to the Mount Olive Division of

¹ Editor's Note: Said form is available from the Township offices.

Inspections and Code Enforcement of the Department of Planning, Zoning and Code Enforcement and a copy is submitted to the Recycling Coordinator. Likewise, receipts or other certified documentation evidencing proof of the disposal of construction and/or demolition debris in a lawful manner shall accompany each application for a certificate of occupancy or certificate of approval. If the owner of property, agent or contractor is performing only a demolition project, receipts or other certified documentation evidencing proof of disposal of demolition debris shall be presented to this office within 15 days upon completion of the project.

- G. All storage tanks must be disposed of in accordance with all state and local laws concerning removal and disposal of storage tanks. The owner of the property must provide written proof of disposal, as set forth in Subsection H hereinafter, to the Division of Inspection and Code Enforcement of the Department of Planning, Zoning and Code Enforcement for transmittal to the Recycling Coordinator.
- H. Disposal of recyclables or yard waste with solid waste prohibited. [Amended 10-10-1995 by Ord. No. 32-95]
 - (1) No person engaged in the collection or disposal of solid waste shall collect solid waste that contains visible signs of designated recyclable materials in garbage bags, trash containers, dumpsters or any other container. All solid waste shall be source-separated in accordance with state statutes.
 - (2) [Amended 3-25-1997 by Ord. No. 13-97] The Township of Mount Olive does not provide any curbside collection of yard waste resulting from lawn mowing, and it is illegal to dispose of yard waste from lawn mowing with solid waste. All property owners and tenants in the Township of Mount Olive must dispose of all yard waste resulting from lawn mowing by one of the following methods:

- (a) Cut and leave yard waste resulting from lawn mowing on owner's property.
 - (b) Composting on owner's property.
 - (c) Delivery to a legally approved composting facility or other legally approved disposal facility.
 - (d) Bag in paper bag(s) approved by the Township. Volume or weight of such bag shall not exceed 34 gallons or 40 pounds. Each bag placed at curbside must have affixed to it a grass clipping sticker which may be purchased, along with the approved paper bag, at locations identified by the Township, the cost of which shall be \$2.
- I. Yard waste, as herein defined, shall be banned from disposal at the Morris County transfer station on Goldmine Road in Mount Olive by all persons. It shall be the Township policy to promote the cut-it-and-leave-it grass program and composting of leaves. [Amended 10-10-1995 by Ord. No. 32-95]
- J. All persons are hereby prohibited from releasing CFC refrigerants into the atmosphere through shearing, shredding, bailing or other methods. All CFC's from white goods must be recovered in accordance with all state and local laws.

§ 211-3. Enforcement; modifications to regulations.
[Amended 9-27-1994 by Ord. No. 13-94]

- A. The Director of the Department of Public Works is hereby authorized and directed to enforce this Article and to establish a reasonable schedule of regulation as to the manner, days and times for collection of recyclables, in accordance with the terms of this Article. Said schedule of regulation shall become effective upon passage of the ordinance. The Director of the Department of Public Works is also hereby authorized to amend

the schedule of regulations. Said amendments to the schedule shall be published in the official newspaper of the Township at least 20 days prior to their effective date. Amendments to the schedule of regulations shall become effective 20 days after their publication, unless the Council adopts a resolution rejecting or modifying said amendments. [Amended 9-25-2001 by Ord. No. 20-2001]

- B. Residential, commercial and institutional solid waste shall be inspected periodically by the Recycling Coordinator and personnel of the Sanitation Department.
- (1) Residential offenders. A warning letter shall be sent to a violator providing 10 days to correct the violation. A summons shall be issued if the violation continues or has not been corrected. Violation stickers shall be affixed by the Recycling Coordinator and/or sanitation personnel to solid waste which contains visible signs of recyclables or should recyclables be placed for collection at the curb and not in conformity with the procedures established herein.
 - (2) Commercial and institutional offenders. A warning letter shall be sent to a violator providing 30 days to correct the violation. A summons shall be issued if the violation continues or has not been corrected.
 - (3) The Recycling Coordinator shall send warning letters to solid waste haulers who violate any provision of this Article by collection of solid waste with visible signs of recyclables. A summons will be issued if the hauler does not correct the violations within 10 days.

§ 211-4. Unauthorized collections. [Amended 9-25-2001 by Ord. No. 20-2001]

From the time of placement at the curb any person picking up recyclables for collection by Township of Mount Olive in accordance with the terms hereof, such material shall be and become the property of the Township of Mount Olive or its authorizing agent, and it shall be a violation of this Article for any person not expressly authorized by the Township to collect or pick up or cause to be picked up any such recyclables. Each collection in violation hereof from one or more residence shall constitute a separate and distinct offense punishable as herein provided. Nothing contained herein, however, shall be construed to limit volunteer or charitable organizations from conducting newspaper drives. The date, time, place and nature of collection shall be presented, in writing, to the Department of Health prior to any such newspaper drive, and the Director of the Department of Public Works shall approve or disapprove the date, time, place and manner of collection in accordance with regulations promulgated under this article. Regularly scheduled or established collections need only be reported once in each calendar year.

§ 211-5. Disposition of collected recyclables.

- A. The Business Administrator of the Township of Mount Olive shall, by bid or contract, establish the destination for all municipally collected recyclables.
- B. Receipts from all sales of recyclables, whether by the municipality or a duly authorized volunteer or charitable organization, shall be recorded by the Department of Health and reported to the appropriate state agency for rebate. Proceeds from sales and rebates of municipally collected recyclables shall be returned to the general treasury to be used to underwrite the cost of the disposal of solid waste and promotion of recycling activities.

- C. Tonnage grant funds received by the Township shall be utilized as a line item in the sanitation budget for use in recycling activities to promote increased compliance.
- D. Residents of the Township of Mount Olive may avail themselves of compost material, at their convenience, in whatever quantities they desire. Transportation of this compost is located at the Recycling Center on Wolfe Road. This compost from the site will be the resident's responsibility.
- E. A small business by definition is one which generates two to four yards of trash per week. Any small business which generates recyclable material shall separate the recyclable material from the trash as per Mount Olive recycling regulations. The recyclable material will be picked up at the owner's request by the Mount Olive Sanitation Department for a fee of \$30 per month. If the amount of recyclable material is two times greater than the average amount of recyclable material generated by all the small businesses being picked up, the monthly fee may be proportionally greater. Mount Olive Township may initiate or cancel any recycling pickup.

§ 211-6. Tonnage grant requirements. [Amended 9-17-1994 by Ord. No. 13-94]

- A. Annual recycling tonnage shall be reported annually to the Municipal Recycling Coordinator by all businesses, institutions, apartment complexes, solid waste haulers and market/vendors collecting recyclables in the Township no later than March 1 of each year.
- B. A complete copy of the annual Recycling Tonnage Report shall be reported to the County Recycling Coordinator.

§ 211-7. Violations and penalties.

- A. Any person, firm or corporation who violates any provision of this Article shall, upon conviction thereof, be punishable by one or more of the following: by imprisonment for a term not exceeding 90 days or by a minimum fine of \$25 per offense or by a period of community service not exceeding 90 days. [Amended 9-27-1994 by Ord. No. 13-94]
- B. Any owner of property, agent or contractor who performs construction/demolition work in the Township and does not provide the Mount Olive Division of Inspections and Code Enforcement of the Department of Planning, Zoning and Code Enforcement with certified documentation evidencing proof of disposal of construction/demolition debris shall also not be given any permit(s) for future demolition project(s) until all court proceedings have been satisfied.

§ 211-8. Education and publicity. [Added 9-27-1994 by Ord. No. 13-94; amended 9-25-2001 by Ord. No. 20-2001]

The Director of the Department of Public Works is hereby authorized and directed to establish and implement a recycling education and publicity program in accordance with the terms of this Article. The programs shall be directed at the residential, commercial and industrial sectors of the community and shall include, but not be limited to, publication and distribution of recycling information, recycling presentations and workshops, education programs in the Township school system, assistance to businesses in locating vendors to accept types of recyclables not collected by the Township and public notification of the penalties for violation of the article.

§§ 211-9 through 211-10. (Reserved)

ARTICLE II
Sanitation District

§ 211-11. Users included in the district.

The Sanitation District shall continue to include the entire Township, but collection of solid waste and recyclable items shall be limited to residential users or customers and nonprofit educational or religious establishments and shall not include any nonresidential users or garden apartment complexes after the effective date of this Article. The Sanitation District shall be expanded to include Stedwick Village II. If at a point in time the Township decides it is in its best interest to expand the sanitation district to collect commercial recyclables, it may do so.

§ 211-12. Definitions.

As used in this Article, the following terms shall have the meanings indicated:

RECYCLABLE ITEMS — All items of solid waste which are required by Article I of this chapter of the Township Code to be separated from other solid waste so as to be collected apart from the ordinary solid waste stream.

SOLID WASTE — Any garbage, refuse, sludge or any other waste material, excluding:

- A. Solid animal or vegetable wastes collected by swine producers licensed by the State Department of Agriculture who collect, prepare and feed such wastes to swine on their own farms.
- B. Recyclable items of solid waste, which includes litter, rubbish and debris.

§ 211-13. Users subject to taxation.

- A. Nonresidential users or customers shall not be subject to taxation for the support of the Sanitation District for services. Services provided would be paid for by a fee.
- B. Residential users shall be subject to taxation for the support of the Sanitation District, with the rate to be fixed by the Township Council.

§ 211-14. Weekly collection to be provided. [Amended 9-25-2001 by Ord. No. 20-2001]

The Township shall provide for municipal collection for solid waste and for recyclable items on a once-a-week basis. The days of collection for both solid waste and recyclable items for each section of the Township shall be as established by the Township's Director of Public Works, and where a collection day falls on a legal holiday, collection for solid waste and recyclable items shall occur the following workday or as published by the Township in the sanitation schedule.

§ 211-15. Placement of material for collection.

- A. No person shall leave for residential collection by the municipality more than three containers, receptacles or bags of solid waste, other than containers for recyclable items. No containers, receptacles or bags shall be of such volume or weight as to exceed 34 gallons or 40 pounds. This provision is waived for holiday collection on Memorial Day, Fourth of July, Labor Day, Thanksgiving and Christmas.
- B. Additional containers/receptacles will be collected, provided that an appropriate sticker is affixed, which sticker may be obtained at the Health Department or other locations determined by the Office of the Chief Financial Officer at the rate of \$2 per sticker.

- C. The placing of items for collection and the separating of recycling items shall be done in accordance with Article I of this chapter of the Code of the Township of Mount Olive.

ARTICLE III Dumpsters

§ 211-16. Requests for dumpster service.

The Township will make available to any resident one nine-cubic-yard dumpster for cleanup purposes. Any resident requesting this service shall comply with the following procedure:

- A. The resident shall call the Health Department of the Township of Mount Olive, which will then forward to the resident an appropriate form of application.
- B. The resident shall fully complete the application and return same to the Township with the appropriate fee. The fees for a household trash dumpster is \$200 for each dumpster load. The fee for a construction debris dumpster consists of a deposit of \$500, including a delivery and removal charge of \$100, plus the actual tipping fee per ton of material. The tipping fee shall be deducted from the remaining \$400 held on deposit. The resident shall be responsible for any tipping fee in excess of the deposit held.
- C. The Township's Sanitation Department will then place a dumpster, not exceeding nine cubic yards, on the resident's property and will permit the dumpster to remain there for a period not to exceed two weeks, at which time the Township shall remove the dumpster and dispose of its contents. Residents may dispose of any item requiring a sticker without additional cost. Large appliances shall be placed on the curb and not inside the dumpster. The total items placed should not exceed the volume of the dumpster.

§ 211-17. Limitations.

- A. The service is not for the benefit of contractors or builders and, if used in such a manner, it will create a violation of this Article.
- B. Residents shall not place any material which is designated as "hazardous waste," as the same is defined in the statutes and administrative regulations, into the dumpster.
- C. The dumpster shall be used essentially for cleanup and minor repairs and renovations to one's property.

§ 211-17.1. Roll-off dumpsters or containers. [Added 9-27-1994 by Ord. No. 14-94]

- A. No person shall park or leave unattended any waste or refuse container, commonly known as a "roll-off dumpster" or "roll-off container," on or along any highway or public property without the written consent of the appropriate municipal, county or state authority having jurisdiction over the highway or public property. Consent shall be valid and remain in effect for a period of not more than 30 days but may be renewed by the appropriate official upon application therefor. To warn the operators of vehicles of the presence of a traffic hazard requiring the exercise of unusual care, any roll-off dumpster or roll-off container parked on or along any highway shall be equipped with display markers consisting of all yellow reflective diamond-shaped panels having a minimum size of 18 inches by 18 inches. These panels shall be mounted at the edge of the dumpster or container at both ends nearest the path of passing vehicles and facing the direction of oncoming traffic. These markers shall have a minimum mounting height of three feet from the bottom of the panels to the surface of the roadway.
- B. A person who is convicted of a violation of this section shall pay a fine of not more than \$100 for each violation. In

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default of the payment of a fine, imprisonment in the county jail for a period of not more than 90 days may be imposed.

§ 211-18. Violations and penalties.

Any person, firm or corporation who violates any provision of this Article shall, upon conviction thereof, be punishable by one or more of the following: by imprisonment for a term not exceeding 90 days or by a fine not exceeding \$1,000 or by a period of community service not exceeding 90 days.

**ARTICLE IV
Dumping**

§ 211-19. Dumping prohibited.

It shall be unlawful in the Township of Mount Olive for any person, partnership or corporation, firm or other entity to

(Cont'd on page 21115)

SPECIAL COLLECTION — A collection at a residence by the township prearranged by the resident to allow the disposal of an unusual volume or quantity of solid waste greater than that which can be placed at curbside for a regular township collection, typically but not exclusively occurring when a home is vacated as a result of a death or a move.

TIRE COLLECTION — A collection at a residence by the township of tires used on autos, trucks, vans or any other motorized vehicles. There shall be a maximum of four (4) tires per collection per household. These tire collections shall occur on a regular schedule to be set up by the Township Health Officer.

§ 211-24. Stickers required.

- A. Township residents shall be required to obtain a sticker from the Township Health Department in order to dispose of a large item or other large item or to have a special collection or tire collection done at their residence. The fees for these stickers shall be as follows:
 - (1) Large items: ten dollars (\$10.) per item.
 - (2) Other large items: five dollars (\$5.) per item.
 - (3) Special collection: two hundred dollars (\$200.) per pickup.
 - (4) Tire collection: two dollars (\$2.) per tire.
- B. Residents requesting a sticker can purchase it at the Health Department Office or request an application for the same through the mail.
- C. The collection of other large items, tires or large items or a special collection will not occur until the resident has purchased the appropriate sticker. The sticker must be affixed to the item to be collected prior to its collection.

§ 211-25. Collection schedule.

Large items and tires, as defined above, shall not be put curbside for regular curbside collection. Large items and tires, as defined

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above, will be collected monthly during specially designated weeks to be announced in advance.

§ 211-26. Hazardous wastes.

Residents shall be prohibited from placing curbside for collection as part of a large item, tire or special collection any item defined above as hazardous waste.

§ 211-27. Violations and penalties.

Any resident who violates any section of this Article shall be subject to a fine of not less than one hundred dollars (\$100.) and not more than one thousand dollars (\$1,000.) and/or not more than ninety (90) days in jail and/or not more than ninety (90) days of community service.

mowers and such other items as the Township Health Officer shall deem to be within this category.

TIRE COLLECTION — A collection at a residence by the township of tires used on autos, trucks, vans or any other motorized vehicles. These tire collections shall occur on a regular specified collection day to be set up by the Township Health Officer.

§ 211-24. Stickers required.

- A. Township residents shall be required to obtain a sticker from the Township Health Department in order to dispose of a large item or to have tire collection done at their residence. The fees for these stickers shall be as follows:
- (1) Large items, excluding those containing Freon: \$10 per item; Freon items: \$15.
 - (2) Other large items: \$5 per item.
 - (3) Household trash dumpster: \$200 per pickup.
 - (4) Construction material and demolition debris collection: \$100 service charge plus tipping costs. This requires a deposit of \$500.
 - (5) Small quantities of construction material and demolition debris, maximum two containers per dwelling unit: \$10 per container, not to exceed 34 gallons in size or 40 pounds in weight.
 - (6) Additional garbage container/bag: \$2 per item.
 - (7) Propane tank disposal: \$10.
 - (8) Tires: \$2 per tire.
 - (9) Grass clippings: \$2 per paper bag. [Added 3-25-1997 by Ord. No. 13-97]

- B. Residents requesting a sticker can purchase it at the Health Department Office or request an application for the same through the mail.
- C. The collection of "other large items," tires and "large items" will not occur until the resident has purchased the appropriate sticker. The sticker must be affixed to the item to be collected prior to its collection.

§ 211-25. Collection schedule.

Large items, as defined above, shall not be put curbside for regular curbside collection. Large items, as defined above, will be collected during specially designated weeks to be announced in advance. Tires will be collected on a regular collection day, provided that a two-dollar sticker is affixed.

§ 211-26. (Reserved)

§ 211-27. Violations and penalties.

- A. Any resident who violates any section of this article shall be subject to a fine of not less than \$100 and not more than \$1,000 and/or not more than 90 days in jail and/or not more than 90 days of community service.
- B. In addition to any penalties that shall be imposed in the preceding subsection, the cost per sticker required for pickup will increase twice the amount of the collection fee per item after the first week that the item(s) is left for pickup without the appropriate sticker. The cost of the sticker will continue to increase twice the amount of the collection fee per item for each additional week that the item(s) remains for pickup without the appropriate sticker.

each fee shall be retained by the Township of Mount Olive for the animal-control budget. For each annual renewal, the fee for the license shall be the same as for the original license, and said license, registration tag and renewal thereof shall expire on the last day of January in each year. Any dog owner or person harboring a dog or found to have an unlicensed dog by the Township Animal Control Officer or any other municipal official after February 1 shall be required to pay an additional delinquent fee of two dollars (\$2.) per month, plus the required license fee as provided in this Article for his dog license, together with any other fines due to summonses issued that may be imposed on him as provided in this Article for failure to obtain a dog license before February 1. The aforementioned fee shall not apply to dogs which have been acquired by the owner after February 1. The owner, however, must present sufficient proof to establish that said dog was acquired after February 1. Dogs used as guides for handicapped persons and commonly known as "hearing ear" and "Seeing Eye" dogs shall be licensed and registered as other dogs hereinabove provided for, except that the owner or keeper of such dog shall not be required to pay any fee therefor. The owner of any newly acquired dog of licensing age shall make application for such license and registration tag for such dog within ten (10) days after such acquisition or age attainment.

- B. The annual license fee for kennels and pet shops shall be as set forth by state law (N.J.S.A. 4:19-15.9 or any amendments thereto.).
- C. Section 106-11.6C(3) shall apply to potentially dangerous dogs. [Added 7-10-1990 by Ord. No. 28-90]

§ 106-8. Running at large; nuisances. [Amended 9-27-1977 by Ord. No. 28-77]

- A. No owner of any dog shall suffer or permit such dog to be upon any private property, other than the premises of the

owner, without consent of the owner or tenant of said property. No owner of any dog shall suffer or permit any dog to be upon public property or within a street or roadway unless the dog is leashed and accompanied by its owner or designated representative. [Amended 3-22-1988 by Ord. No. 13-88]

B. No person owning, harboring, keeping or in charge of any dog shall cause, suffer or allow such dog to soil, defile, defecate on or commit any nuisance on any common thoroughfare, sidewalk, passageway, bypath, play area, park or any place where people congregate or walk or upon any public property whatsoever or upon any private property without the permission of the owner of said property. The restriction in this section shall not apply to that portion of the street lying between the curblines, which shall be used to curb such dog under the following conditions:

- (1) The person who so curbs such dog shall immediately remove all feces deposited by such dog by any sanitary method approved by the local health authority. No person shall allow the feces deposited by such dog to escape into a storm sewer.
- (2) The feces removed from the aforementioned designated area shall be disposed of by the person owning, harboring, keeping or in charge of any dog curbed, in accordance with the provisions of this section, in a sanitary manner approved by the local health authority.
- (3) The provisions of this section shall not apply to blind persons who may use dogs as guides.

C. The owner or other person who is walking a dog shall be responsible to immediately remove any defecation of the dog from the ground, unless such occurs on the property of the owner. [Added 3-22-1988 by Ord. No. 13-88]

§ 106-9. Authority to enter premises to seize dogs; animal pound. [Amended 7-10-1990 by Ord. No. 28-90]

A. The ACO of the Township of Mount Olive, when in immediate pursuit of a dog or dogs which he may lawfully seize or



§ 400-91. Residential clusters. [Amended 4-28-1998 by Ord. No. 5-98]

- A. Residential clusters. The purpose of this section is to provide specific standards for the creation, design and maintenance of open space when residential cluster developments are approved.
- (1) The minimum acreage for each zone required for cluster development shall be as follows:
 - (a) RR-AA and RR-A Zone: 15 acres.
 - (b) R-2 Zones: 15 acres.
 - (c) R-3, R-4 and R-5 Zones: 10 acres.
 - (2) In computing the minimum amount of acreage in any tract, all open spaces shall be included.
- B. Open space requirements. All open space, as designated on any cluster development, shall be either dedicated to the municipality for use in its sole discretion or dedicated to an organization for the ownership and maintenance of the common open space for the benefit of the owners and residents of the development. The open space and any organization for the ownership and maintenance of said open space shall have the following requirements:
- (1) All open space shall be for recreational and/or conservation use and used on a nonprofit basis serving and supporting the residential use to which the spaces relate.
 - (2) Within 90 days of the granting of preliminary approval, the developer shall petition the township governing body to have the governing body consider whether or not it desires to accept the open space as township property. No final approval of any subdivision pursuant to these provisions shall be granted indicating that the open space shall be owned by the township unless the governing body, prior to final approval, has agreed to accept

ownership. Whether or not the open space shall be dedicated for ownership by the township shall be within the sole discretion of the township governing body. In the event that the township governing body does not desire to own the open space, then said open space shall be dedicated to a nonprofit organization whose membership is restricted to owners and/or residents of the development and which organization shall be formed solely for the purpose of ownership and maintenance of the common open space. Any such organization shall be controlled under the following regulations:

- (a) Any organization initially created by the developer for the ownership and maintenance of the common open space shall clearly describe in its bylaws the rights and obligations of the owners or residents in the development, and the Articles of Incorporation of the organization shall be submitted for review by the Planning Board and the Township Attorney prior to the granting of final approval by the township.
 - (b) Such organization shall be responsible for liability insurance, municipal taxes, maintenance of land and any facilities that may be erected on any land deeded to said organization and shall hold the township harmless from any liability.
 - (c) Such organization shall not be dissolved and shall not dispose of any space otherwise than as permitted by N.J.S.A. 40:55D-43, and the failure of such organization to maintain the open space in reasonable order and condition shall have the consequences set forth in N.J.S.A. 40:55D-43.
- (3) The minimum amount of open space shall be equal to that required for the applicable zone district as stated in § 400-100 of this chapter. Land utilized for

street rights-of-way shall not be included in the open space requirements. No more than 25% of the required open space may be encumbered by freshwater wetlands or slopes in excess of 25%. No portion of the required open space shall be improved with detention or retention basins, water storage towers and/or sanitary sewerage treatment facilities. [Amended 3-23-1999 by Ord. No. 7-99]

(a) The Planning Board may permit a cluster plan to show a greater percentage of the required open space to be situated on lands having slopes in excess of 25% or freshwater wetlands; however, no more than 50% of the required open space shall so encumbered. An alternative plan seeking to utilize lands with environmental constraints within its required open space component must demonstrate that it satisfies one or more of the following criteria:

- [1] The alternative proposal advances a comprehensive open space network in conjunction with areas beyond subject property development;
- [2] The alternative proposal enhances a habitat for endangered plant and/or wildlife species;
- [3] The alternative proposal creates visual appealing buffer; or
- [4] The alternative proposal promotes a more cohesive open space for the benefit of the residents within the proposed subdivision.

(b) The Planning Board shall have the discretion to permit an alternate plan within the permitted parameters of a cluster subdivision.

C. Location of clustered lots. In residential cluster developments containing more than 10 residential lots, it is expected that the residential lots will be located in

groups or clusters of lots, each group of clusters separated by portions of the common open space, with as many lots as reasonably possible abutting the common open space. The Planning Board may substitute an alternative configuration where the open space is provided as a contiguous tract(s) where a concentration of open space can serve a desired public purpose, including, but not limited to, active recreation facilities. [Amended 3-23-1999 by Ord. No. 7-99]

§ 400-92. Rural residential development.

Any person desiring to subdivide property in any residential zone for single-family home lots may elect to apply to the approving authority for a major subdivision under the following reduced improvement requirements of this section, with all other major subdivision requirements applying. The approving authority shall examine each request to determine whether it meets the following minimum standards and requirements.

- A. Every lot in the development shall have a minimum area of 80,000 square feet.
- B. Each lot shall have a minimum frontage, width and depth of 250 feet.
- C. The development will not adversely affect the development of adjacent or adjoining property.
- D. The proposed local street(s) will not interconnect with existing or proposed streets of higher classifications to form continuous routes. They will be designed to discourage any through traffic, will have the exclusive function of providing access to properties abutting the proposed street and will follow the contours of the land to the greatest extent possible.
- E. If it is determined by the approving authority that the proposed development conforms to the standards established for rural residential development, the

having a direct effect upon flood-prone areas in neighboring communities may be submitted to the appropriate agency in said neighboring community for its comments and recommendations.

K. Violations and penalties.

- (1) Any person, firm or corporation who or which shall violate any provision of this section shall be liable to a fine not exceeding five hundred dollars (\$500.) or to imprisonment for a term not exceeding ninety (90) days, or both, and each day such violation continues shall constitute a separate violation or offense.
- (2) In the event that the owner or possessor of said lands shall refuse or neglect to abate or remedy the violation, the township shall cause the condition complained of to be abated and remedied. Any costs or expenses incurred by the township in abating or remedying the violation shall become a lien upon the land and shall be added to and become and form a part of the taxes next to be assessed and levied upon said lands, the same to bear interest at the same rate as taxes, and shall be collected and enforced by the same officers and in the same manner as taxes.

§ 400-50. Floodplain regulations.

A. The purposes are to:

- (1) Implement the land use rules and regulations promulgated by the New Jersey Department of Environmental Protection for floodways and the flood fringe portion of a flood hazard area.
- (2) Discourage construction and regrading in flood hazard areas.

- (3) Prevent encroachments into flood hazard areas which would obstruct or constrict the area through which water must pass.
 - (4) Prevent pollution of watercourses during low- or high-water periods by preventing the placing or storing of unsanitary or dangerous substances in the flood hazard areas.
- B. The flood hazard design elevation shall be determined on an individual basis based upon stream encroachment line data from the Division of Water Resources or, in the absence of that data, the flood elevation based on a two-hundred-year storm frequency. One or the other shall be delineated on the plat. In addition, the Municipal Engineer may, upon receipt of the application and with the consent of the landowner, determine the precise location of a floodway and flood fringe area by close inspection, field survey or other appropriate method and cause the same to be marked on the ground and on the plat, and notify the owner, the New Jersey Department of Environmental Protection, Division of Water Resources, and the approving authority. The assistance of the United States Department of Agriculture, Soil Conservation Service, the Delaware River Basin Commission, United States Corps of Engineers and the New Jersey Department of Environmental Protection, Division of Water Resources may be sought to aid in delineating the flood hazard design elevation, except that where state or federal agencies shall subsequently publish any reports which delineate the flood hazard design elevation of a watercourse, said report shall be the officially delineated flood hazard area as if said report were published in this section.
- C. Any lot containing a floodway portion of a drainage course and on which it is proposed to regrade and/or construct an improvement shall not be permitted unless the proposed use is permitted by this chapter, plat approval has been granted, and a floodway permit has been issued by the New Jersey Department of Environ-

mental Protection, Division of Water Resources where required by state regulations.

- D. Any lot containing a flood fringe portion of the flood hazard area and on which it is proposed to regrade and/or construct an improvement shall not be permitted unless the proposed use is permitted by this section and until plat approval has been granted.
- E. The procedure for reviewing any proposed regrading and/or construction shall be the same as set forth for plat review. No application shall be approved and no permit granted until all zoning violations have either been corrected or a variance granted.
- F. Permitted uses in a flood fringe portion of the flood hazard area shall be restricted to the following, provided that they are permitted uses in the district in which the flood fringe portion is located.
 - (1) Agriculture: general farming, pasture, grazing, outdoor plant nurseries, horticulture, viticulture, truck farming, forestry, sod farming and wild crop harvesting.
 - (2) Industrial/commercial: yards, loading areas and parking areas.
 - (3) Recreation: golf courses, improved courts and playing fields, swimming areas, boat launching ramps, picnic and camping and open space uses such as hiking trails.
 - (4) Residential: lawns, gardens, parking areas and play areas.
- G. The applicant shall submit maps, reports and other appropriate documents permitting the approving authority to evaluate whether the proposal has an inherent low flood damage potential; does not obstruct flood flows or increase flood heights and/or velocities; does not affect adversely the water-carrying capacity of any delineated floodway and/or channel; does not increase local runoff and erosion; does not duly stress the

natural environment of the floodplain or degrade the quality of surface water or the quality and quantity of groundwaters; does not require channel modification or relocation; does not require fill or the erection of structures; and does not include the storage of equipment and materials.

- H. Prior to any action by the approving authority on a plat involving a floodway or flood fringe area, a public hearing shall be set and conducted by the approving authority. Notice of the hearing shall be as required under § 400-25 entitled "Public hearings and notices" in Article III.
- I. Upon reviewing the application, hearing the applicant's representation, hearing comments from the general public and other township agencies to which the application was forwarded for comment, the approving authority shall deny, approve, subject to conditions, or approve the application. Its conclusions shall be based on findings related to the above criteria.

§ 400-51. Grading and filling.

- A. All lots where fill material is deposited shall have clean fill and/or topsoil deposited which shall be graded to allow complete surface draining of the lot into local storm sewer systems or natural drainage courses. No regrading of a lot shall be permitted which would create or aggravate water stagnation or drainage problems on-site or on adjacent properties or which will violate the provisions of the soil erosion and sediment control, soil removal and redistribution and floodplain provisions of this chapter. Grading shall be limited to areas shown on an approved subdivision. Any topsoil disturbed during approved excavation and grading operations shall be redistributed throughout the site.
- B. All lots being filled shall be filled with clean fill and/or topsoil to allow complete surface draining of the lot into local storm sewer systems or natural drainage rights-of-





State of New Jersey

DONALD T. DiFRANCESCO
Acting Governor

Department of Environmental Protection

Robert C. Shinn, Jr.
Commissioner

Division of Parks and Forestry
Office of Natural Lands Management
Natural Heritage Program
P.O. Box 404
Trenton, NJ 08625-0404
Tel. #609-984-1339
Fax. #609-984-1427

October 18, 2001

Stephanie Schneider
Schoor DePalma, Inc.
200 State Highway 9
P.O. Box 900
Manalapan, NJ 07726-0900

Re: Mount Olive Wastewater Management Plan

Dear Ms. Schneider:

Thank you for your data request regarding rare species information for Mount Olive Township, Morris County.

Enclosed is a list of rare species and natural communities documented from Mount Olive Township. Additionally, enclosed is a list of rare species and natural communities that have been documented from Morris County. This county list can be used as a master species list for directing further inventory work. If suitable habitat is present within the study area, these species have potential to be present. If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend you contact the Division of Fish and Wildlife, Endangered and Nongame Species Program.

In order to red flag the general locations of documented occurrences of rare and endangered species and natural communities, we have prepared computer generated Natural Heritage Index Maps. Enclosed please find these maps for the Tranquility, Stanhope, Hackensack and Chester USGS quadrangle. If individual projects are to be located in the shaded areas of these maps, the Natural Heritage Program can be contacted for additional information.

The Natural Heritage Program reviews its data periodically to identify priority sites for natural diversity in the State. Included as priority sites are some of the State's best habitats for rare and endangered species and natural communities. Three of these sites are located within or near the areas you have outlined. Please refer to the enclosed Natural Heritage Priority Site Maps for the locations and boundaries of these sites. On the back of each Priority Site Map is a report describing the significance of the site. You may find the site biodiversity significance rating to be useful if you need to prioritize among the sites in your environmental assessment.

PLEASE SEE THE ATTACHED 'CAUTIONS AND RESTRICTIONS ON NHP DATA'.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,

Herbert A. Lord

Herbert A. Lord
Data Request Specialist

cc: Thomas F. Breden
Lawrence Niles
NHP File No. 01-4007487

NATURAL LANDS MANAGEMENT

CAUTIONS AND RESTRICTIONS ON NATURAL HERITAGE DATA

The quantity and quality of data collected by the Natural Heritage Program is dependent on the research and observations of many individuals and organizations. Not all of this information is the result of comprehensive or site-specific field surveys. Some natural areas in New Jersey have never been thoroughly surveyed. As a result, new locations for plant and animal species are continuously added to the data base. Since data acquisition is a dynamic, ongoing process, the Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of New Jersey. Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The attached data is provided as one source of information to assist others in the preservation of natural diversity.

This office cannot provide a letter of interpretation or a statement addressing the classification of wetlands as defined by the Freshwater Wetlands Act. Requests for such determination should be sent to the DEP Land Use Regulation Program, P.O. Box 401, Trenton, NJ 08625-0401.

This cautions and restrictions notice must be included whenever information provided by the Natural Heritage Database is published.

THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT
*** Vertebrates								
ACCIPITER COOPERII	COOPER'S HAWK		T/T		G5	S3B, S4N	1999-04-26	
AMMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/S		G5	S2B	1993-07-03	Y
CLEMmys INSCULPTA	WOOD TURTLE		T		G4	S3	1995-06-07	Y
CLEMmys INSCULPTA	WOOD TURTLE		T		G4	S3	1980-08-??	
CLEMmys INSCULPTA	WOOD TURTLE		T		G4	S3	1996-08-17	Y
CLEMmys INSCULPTA	WOOD TURTLE		T		G4	S3	2000-06-23	Y
CLEMmys INSCULPTA	WOOD TURTLE		T		G4	S3	1994-10-??	Y
CLEMmys INSCULPTA	WOOD TURTLE		T		G4	S3	1995-06-06	?
CLEMmys MUHLENBERGII	BOG TURTLE	LT	E		G3	S2	1990-05-??	Y
CLEMmys MUHLENBERGII	BOG TURTLE	LT	E		G3	S2	1997-06-??	Y
CLEMmys MUHLENBERGII	BOG TURTLE	LT	E		G3	S2	1993-07-03	Y
DOLICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2B	1996-06-15	Y
DOLICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2B	1993-07-03	Y
DOLICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2B	1996-06-15	Y
MELANERPES ERYTHROCEPHALUS	RED-HEADED WOODPECKER		T/T		G5	S2B, S2N	1994-10-27	Y
STRIX VARIA	BARRED OWL		T/T		G5	S3B	1986-03-??	Y
STRIX VARIA	BARRED OWL		T/T		G5	S3B	1980-??-??	Y
STRIX VARIA	BARRED OWL		T/T		G5	S3B	1998-05-11	Y
STRIX VARIA	BARRED OWL		T/T		G5	S3B	2000-07-28	
*** Ecosystems								
BLACK SPRUCE SWAMP	BLACK SPRUCE SWAMP				G4	S1	1985-09-09	?
*** Invertebrates								
CORDULEGASTER ERRONEA	TIGER SPIKETAIL				G4	S2	2000-07-06	Y
CORDULEGASTER ERRONEA	TIGER SPIKETAIL				G4	S2	2000-06-23	Y
CORDULEGASTER OBLIQUA	ARROWHEAD SPIKETAIL				G4	S2	2000-07-06	Y
LAMPUSILIS RADIIATA	EASTERN LAMPUSSEL				G5	S3	??-??-??-??	Y
SATYRIUM EDWARDSII	EDWARDS' HAINSTREAK				G4	S3	1997-07-15	Y
*** Vascular plants								

6 OCT 2001

MOUNT OLIVE TOWNSHIP, MORRIS COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL GRANK STATUS	SRANK	DATE OBSERVED	IDENT.
DIOMEDEA POLIFOLIA VAR LAUCOPHYLLA	BOG ROSEMARY		E	G5T5	S1	1917-09-??	Y
ANGELICA VENENOSA	HAIRY ANGELICA			G5	S2	1985-09-09	Y
DIETRICHIA ONEIDENSE	BLUNT-LOBE GRAPE FERN			G4Q	S2	1894-08-28	Y
ARDAMINE PRATENSIS VAR ALUSTRIS	MEADOW CUCKOO-FLOWER			G5T5	S3	1990-04-24	Y
ARDAMINE PRATENSIS VAR ALUSTRIS	MEADOW CUCKOO-FLOWER			G5T5	S3	1990-05-01	Y
AREX BRUNNESCENS VAR PHAEROSTACHYA	ROUND-SPIKE BROWNISH SEDGE		E	G5T5	S1	1916-07-08	Y
AREX LIMOSA	MUD SEDGE		E	G5	S1	1918-06-09	Y
AREX UTRICULATA	BOTTLE-SHAPED SEDGE			G5	S2	1935-06-23	Y
DIARUM PALUSTRE	MARSH CINQUEFOIL		E	G5	S1	1992-SPRING	Y
DIACA PALUSTRIS	LEATHERWOOD			G4	S2	1990-04-03	Y
DIACA PALUSTRIS	LEATHERWOOD			G4	S2	1990-04-25	Y
DIUSETUM PRATENSE	MEADOW HORSETAIL		E	G5	S1	1990-04-03	Y
DIOPHORUM GRACILE VAR GRACILE	SLENDER COTTON-GRASS		E	G5T?	SH	1902-06-14	Y
DIPOCARPIUM DRYOPTERIS	OAK FERN			G5	S2	1979-05-13	Y
DIONIAS BULLATA	SWAMP-PINK	LT	E	G3	S3	1907-05-07	Y
DIONIAS BULLATA	SWAMP-PINK	LT	E	G3	S3	1945-04-28	Y
DIONIAS BULLATA	SWAMP-PINK	LT	E	G3	S3	1985-09-09	Y
DIERACIUM KALMII VAR ASCICULATUM	CANADA HAWKWEED		E	G5T?	S1	1894-09-26	Y
DIAMIA POLIFOLIA	PALE-LAUREL		E	G5	S1	1870-05-26	Y
DIANA TRISULCA	STAR DUCKWEED			G5	S3	1990-04-25	Y
DIANTHIUM VIRGINICUM	VIRGINIA BUNCHFLOWER		E	G5	S1	1917-09-??	Y
DIUM EFFUSUM	TALL MILLET GRASS		E	G5	SH.1	1980-??-??	Y
DIOPHYLLUM VERTICILLATUM	WHORLED WATER-MILFOIL		E	G5	SH	1936-07-18	Y
DIOPH LUTEA SSP PUMILA	SMALL YELLOW POND-LILY		E	G5T4T5	SH	1892-06-??	?
DIUNICUM BOREALE	NORTHERN PANIC GRASS		E	G5	S1	1906-06-10	Y

5 OCT 2001

MOUNT OLIVE TOWNSHIP, MORRIS COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL GRANK STATUS	SRANK	DATE OBSERVED	IDENT.
YAMOGETON ALPINUS	NORTHERN PONDWEED		E	G5	S1	18??-??-??	?
YAMOGETON ILLINOENSIS	ILLINOIS PONDWEED		E	G5	S1	1935-06-23	Y
YAMOGETON OBTUSIFOLIUS	BLUNT-LEAF PONDWEED		E	G5	S1	1996-08-01	Y
YAMOGETON ROBBINSII	ROBBIN'S PONDWEED		E	G5	S2	1869-08-06	Y
YAMOGETON ZOSTERIFORMIS	DEEL-GRASS PONDWEED		E	G5	S1	1867-07-04	Y
ALIX LUCIDA SSP LUCIDA	SHINING WILLOW			G5T5	S1	1885-06-12	Y
ALIX PEDICELLARIS	BOG WILLOW		E	G5	S1	1935-06-23	Y
MEUCHZERIA PALUSTRIS VAR MERICANA	ARROW-GRASS		E	G5T5	SH	1892-06-27	Y
PARGANIUM ANGUSTIFOLIUM	NARROW-LEAF BURR-REED		E	G5	SH	1877-08-23	Y
ROLLIUS LAXUS SSP LAXUS	SPREADING GLOBE FLOWER		E	G4T3	S1	1879-06-06	Y
COLA BLANDA VAR ALUSTRIFORMIS	LARGE-LEAF WHITE VIOLET			G4G5T4T5	S3	1990-04-24	Y

Records Processed

NATURAL LANDS MANAGEMENT

NATURAL HERITAGE INDEX MAPS

The Natural Heritage Database contains several thousand records of individual occurrences of endangered and threatened species and ecosystems. Many of these occurrences either have not been documented in recent years or have not had habitat boundaries delineated. Because much work remains to be done to delineate habitat boundaries and determine current status for these occurrences, Natural Heritage Index Maps were devised to red flag general areas in which the occurrences are located. The index maps are meant to be used as a tool to point to areas which may be of significance for endangered biological diversity. These maps do not depict all endangered species habitat in the state, but merely general areas which contain documented occurrences. Many additional areas may contain unidentified or poorly documented occurrences.

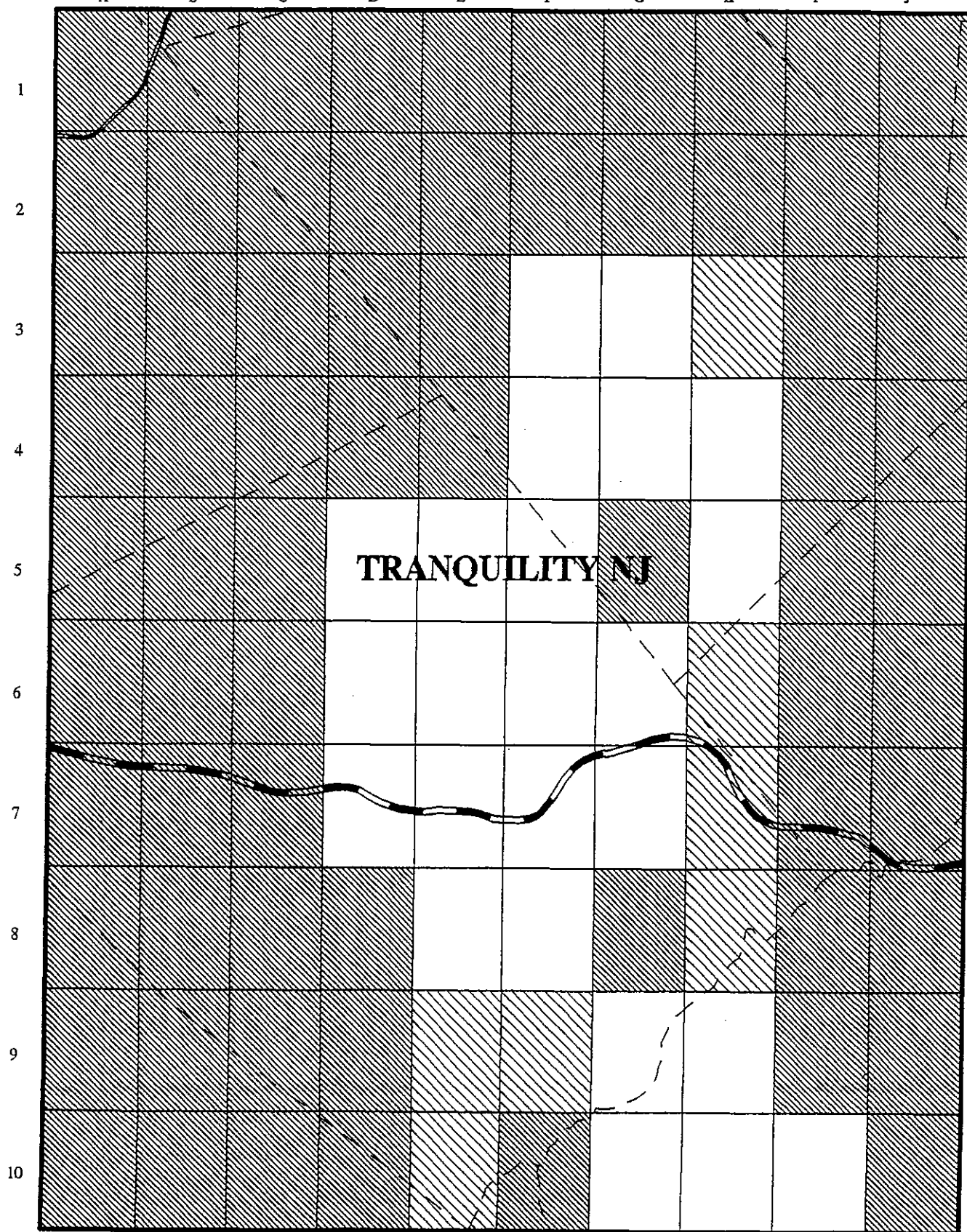
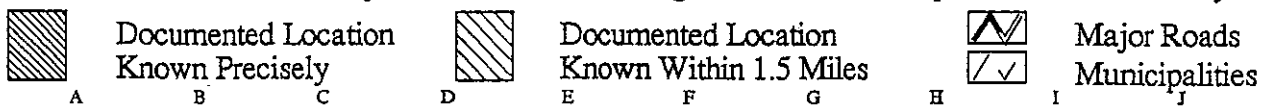
The maps have been produced using a computer generated grid which shades a grid cell approximately 330 acres in size if an endangered or threatened species or ecosystem has been documented anywhere within the cell. To use these maps, we suggest that you first find the location to be checked on the quad maps and then refer to the same grid location of the Natural Heritage Index Maps. The Natural Heritage Program can be contacted for additional information as specific projects are planned.



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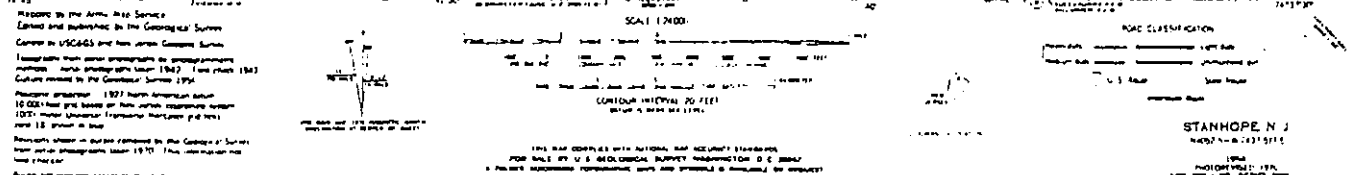
Generalized Natural Heritage Index Map

Generalized Locations for Rare and Endangered Elements of Natural Diversity



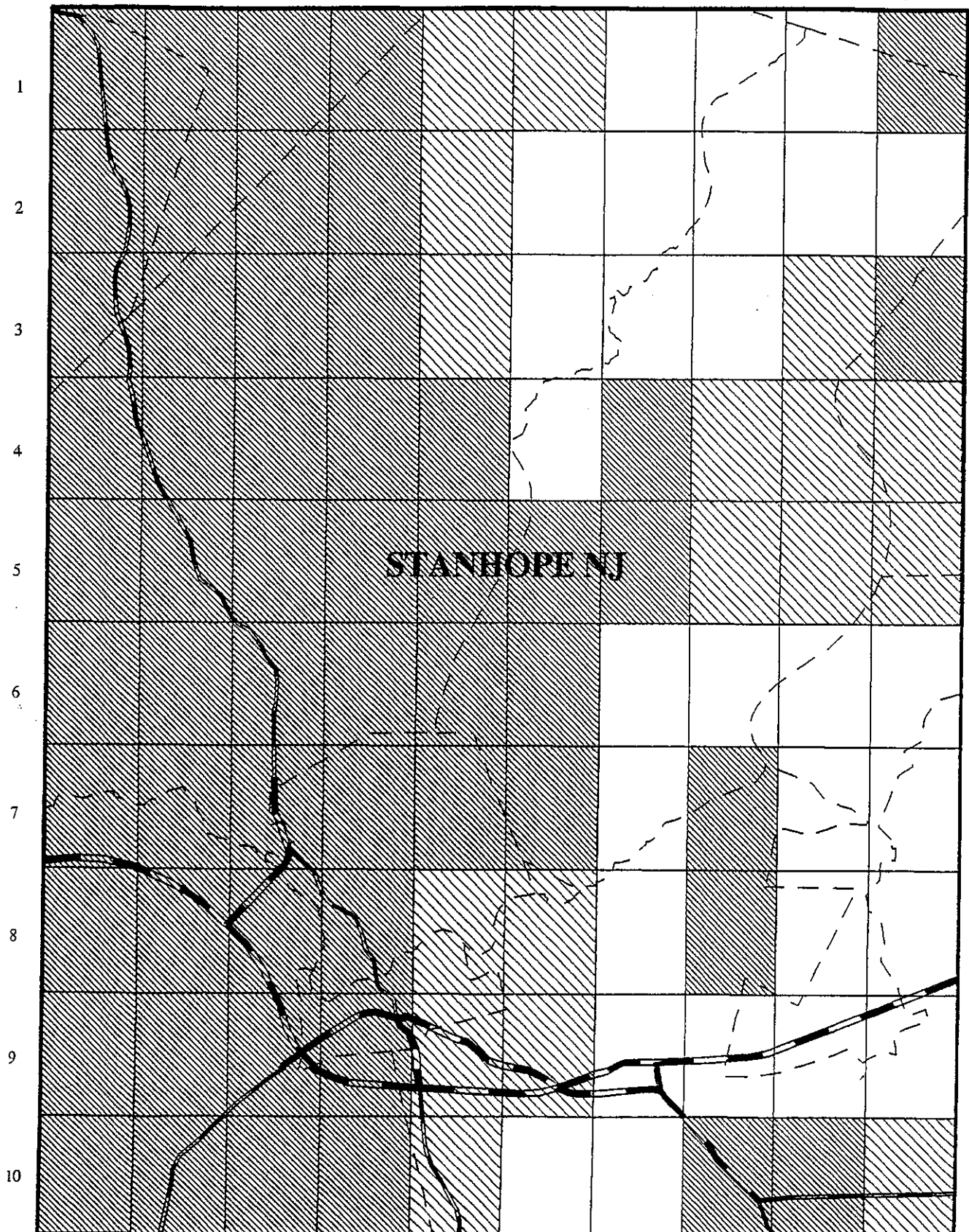
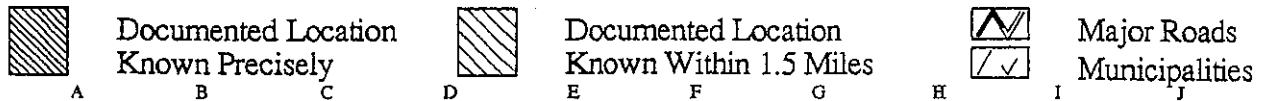
NOTE: This is not a complete map of rare and endangered species habitat for this area. It reflects data on known occurrences compiled as of the above date. It includes both historically and recently documented habitat. Additional occurrences may be found on unsurveyed habitat. For more information, contact the Office of Natural Lands Management, CN404, Trenton, NJ 08625.

APRIL 1998
Updated semiannually



Generalized Natural Heritage Index Map

Generalized Locations for Rare and Endangered Elements of Natural Diversity



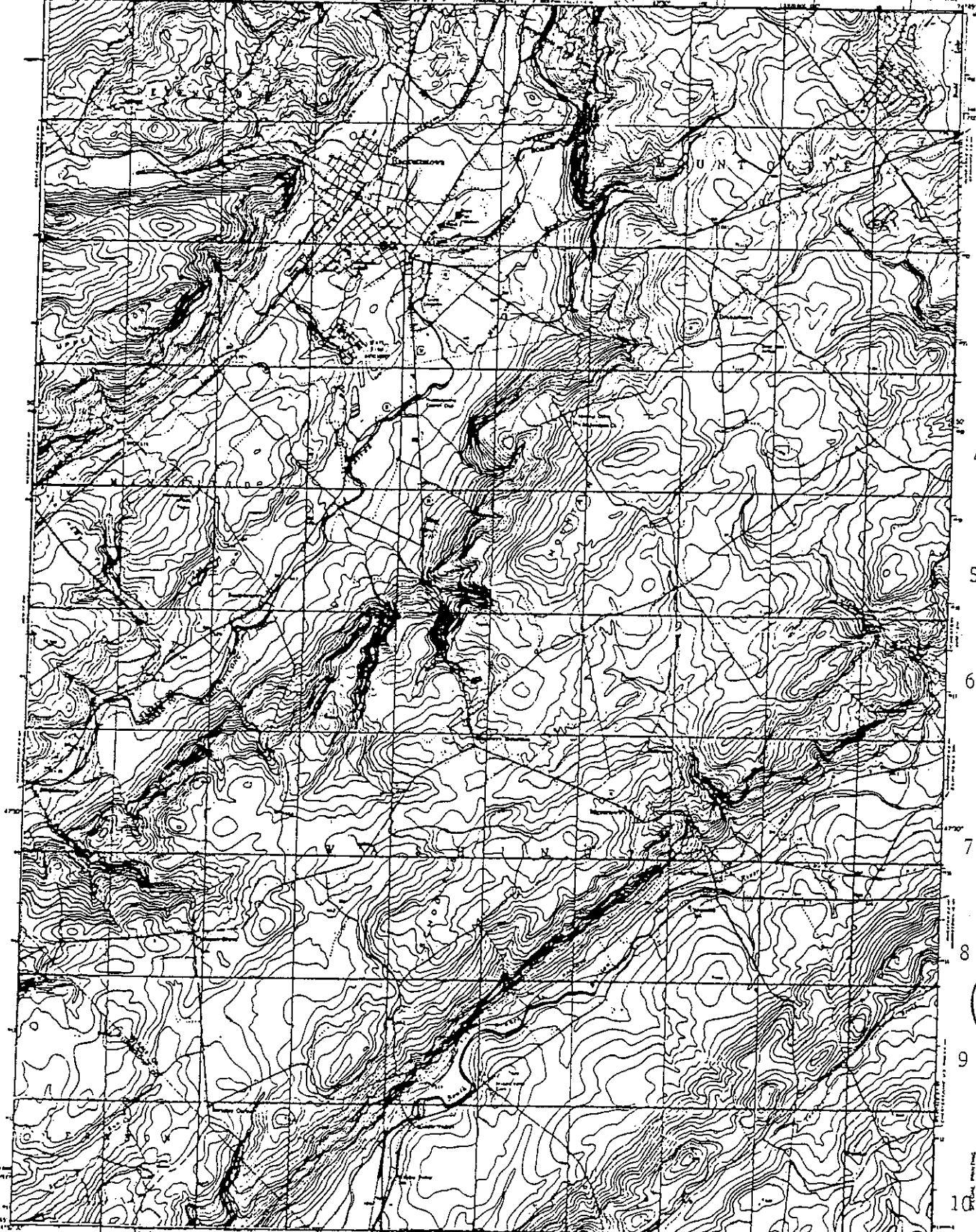
NOTE: This is not a complete map of rare and endangered species habitat for this area. It reflects data on known occurrences compiled as of the above date. It includes both historically and recently documented habitat. Additional occurrences may be found on unsurveyed habitat. For more information, contact the Office of Natural Lands Management, CN404, Trenton, NJ 08625.

APRIL 1998
Updated semiannually

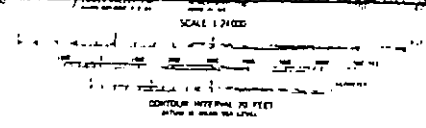
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

HACKETTSTOWN QUADRANGLE
NEW JERSEY
7.5 MINUTE SERIES (TOPOGRAPHIC)



Revised by the Army Map Service
Extract and published by the Geological Survey
Control by USGS, USACE, and the Army Corps of Engineers
Topographic data from aerial photographs by the Army Corps of Engineers
and the Geological Survey, 1957. First edition 1957.
Control points in the quadrangle survey 1957.
Revised edition: 1957. Reprint edition 1957.
10,000 foot grid based on New Jersey datum, 1957.
Map and published under the authority of the
United States Army Corps of Engineers.
1000 meter Universal Transverse Mercator grid lines
shown in blue.



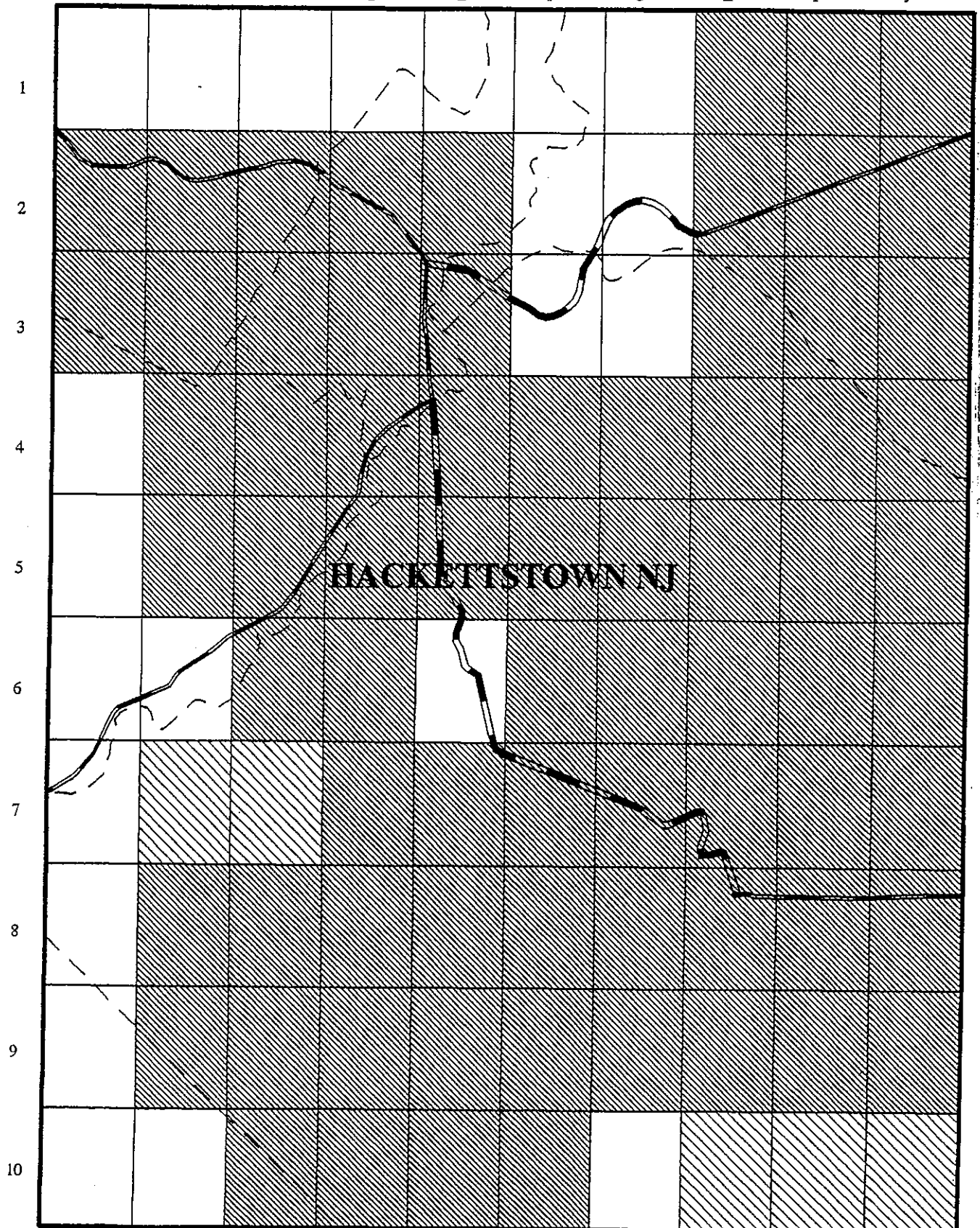
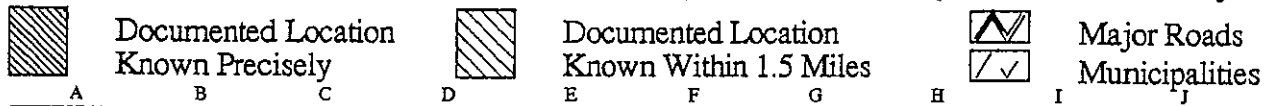
ROAD CLASSIFICATION
 Main Road ———— Light Road ————
 Feeder Road ———— Unimproved Road ————
 U.S. Route ———— State Route ————

HACKETTSTOWN N.J.
 1:250,000 1957/58

110

Generalized Natural Heritage Index Map

Generalized Locations for Rare and Endangered Elements of Natural Diversity



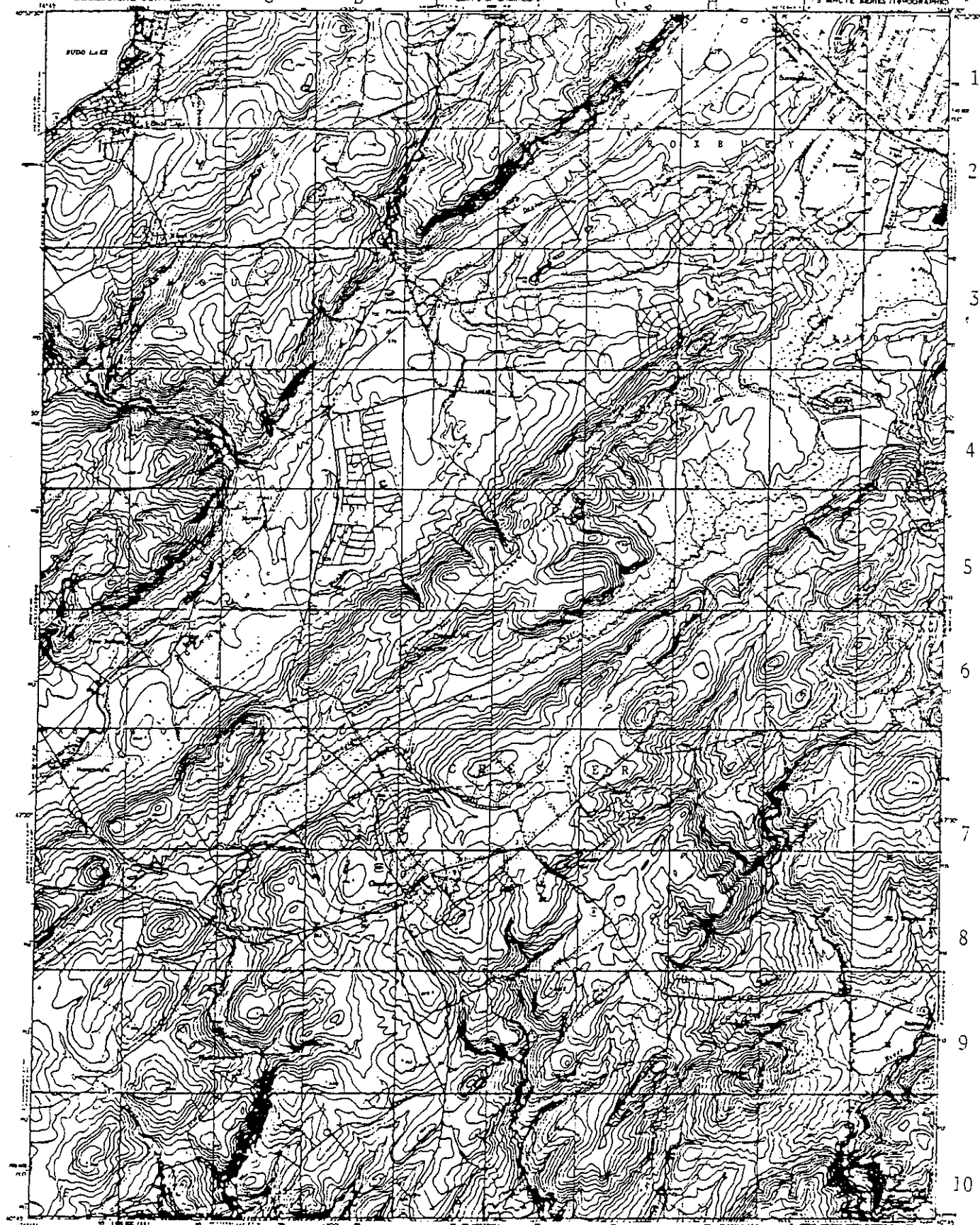
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APRIL 1998
Updated semiannually

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

CHESTER QUADRANGLE
NEW JERSEY - MORRIS CO
7.5 MINUTE SERIES (TOPOGRAPHIC)



Revised by the Army, 1942. Contours
derived and published by the Geological Survey.

Control by USGS, USCAAS, and New Jersey Geological Survey.
Topography from aerial photographs by ground
photorecognition, 1942-1943. Contours derived from
contours derived by the Geological Survey, 1904.

Published September, 1947. North American Datum.
10,000-foot base grid (not shown) of New Jersey State Survey.
1000-foot Universal Transverse Mercator grid zone
18, 19, 20, 21, 22.

Boundaries shown in purple outlined by the Geological Survey.
New Jersey State Survey, 1910. This information
not shown (check).

Purposes and conditions of use of this map.

CONTOUR INTERVAL, 20 FEET

SCALE 1:24,000

ROAD CLASSIFICATION

Primary Road
Secondary Road
Tertiary Road
Quaternary Road
Paved
Unpaved
Gravel
Dirt
Grass
Water

CHESTER, N. J.

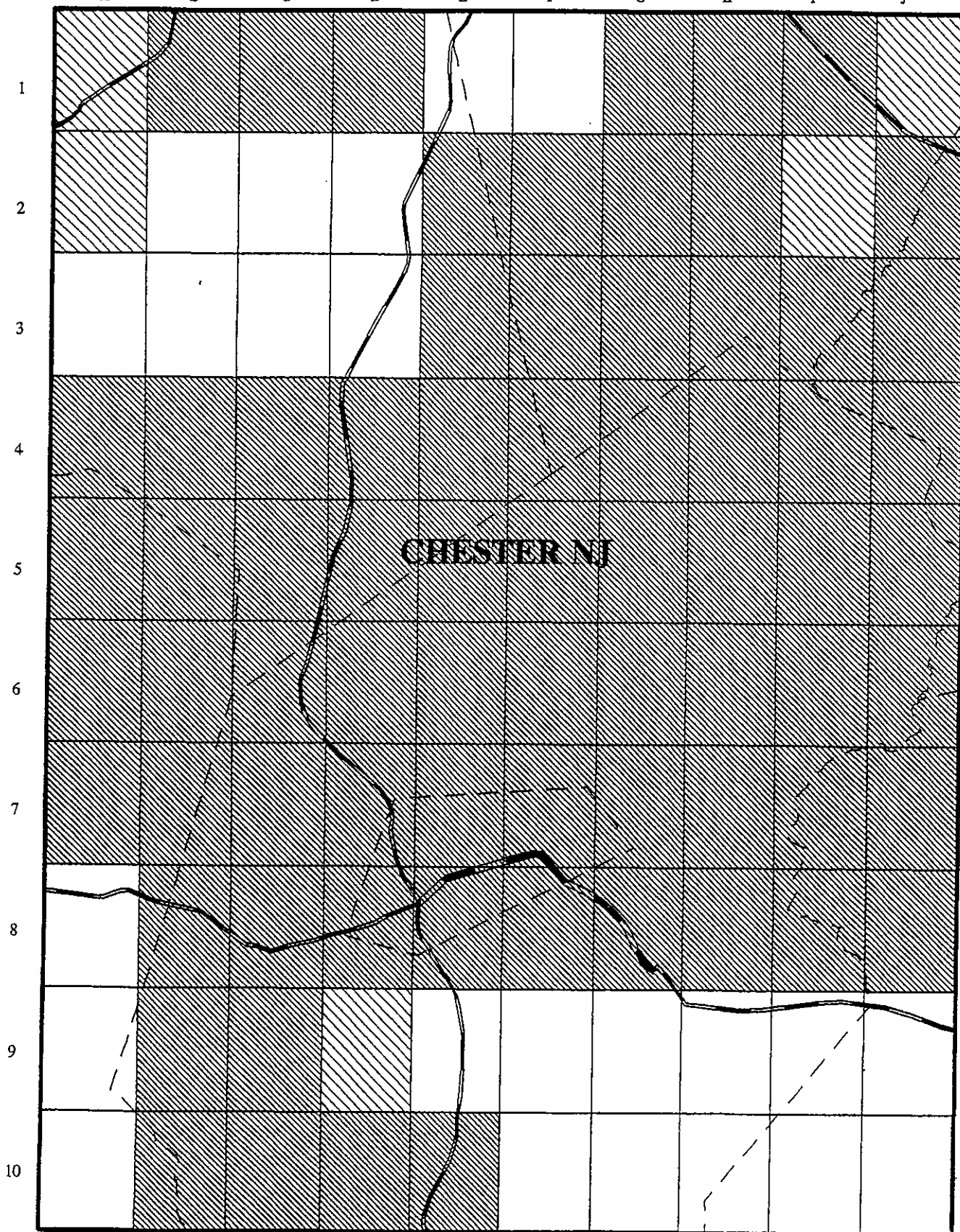
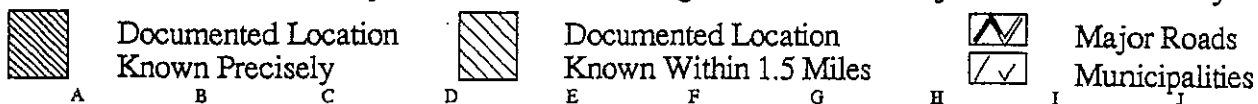
7.5 MINUTE SERIES

1947

1:24,000

Generalized Natural Heritage Index Map

Generalized Locations for Rare and Endangered Elements of Natural Diversity



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APRIL 1998
Updated semiannually

Frequently Asked Questions

About Natural Heritage Priority Sites

What are Natural Heritage Priority Sites?

Through its Natural Heritage Database, the Office of Natural Lands Management (ONLM) identifies critically important areas to conserve New Jersey's biological diversity. The database provides detailed, up-to-date information on rare species and natural communities to planners, developers, and conservation agencies for use in resource management, environmental impact assessment, and both public and private land protection efforts.

Using the database, ONLM has identified Natural Heritage Priority Sites that represent some of the best remaining habitat for rare species and exemplary natural communities in the state. These areas should be considered to be top priorities for the preservation of biological diversity in New Jersey. If these sites become degraded or destroyed, we may lose some of the unique components of our natural heritage.

ONLM has identified 389 priority sites over the course of more than 10 years. We have received assistance from many partner individuals and agencies over this time. The Nature Conservancy and the DEP Endangered and Nongame Species Program have provided key information or assisted with the delineation of a number of the sites.

How are Natural Heritage Priority Site maps used in conservation of biological diversity?

Natural Heritage Priority Site maps are used by individuals and agencies concerned with the protection and management of land. The maps have been used by municipalities preparing natural resource inventories; public and private conservation organizations preparing open space acquisition goals; land developers and consultants identifying environmentally sensitive lands; and public and private landowners developing land management plans.

Natural Heritage Priority Sites contain some of the best and most viable occurrences of endangered and threatened species and natural communities, but they do not cover all known habitat for endangered and threatened species in New Jersey. If

information is needed on whether or not endangered or threatened species have been documented from a particular piece of land, a Natural Heritage Database search can be requested by contacting the Office of Natural Lands Management at the address below.

What do the boundaries of the sites contain?

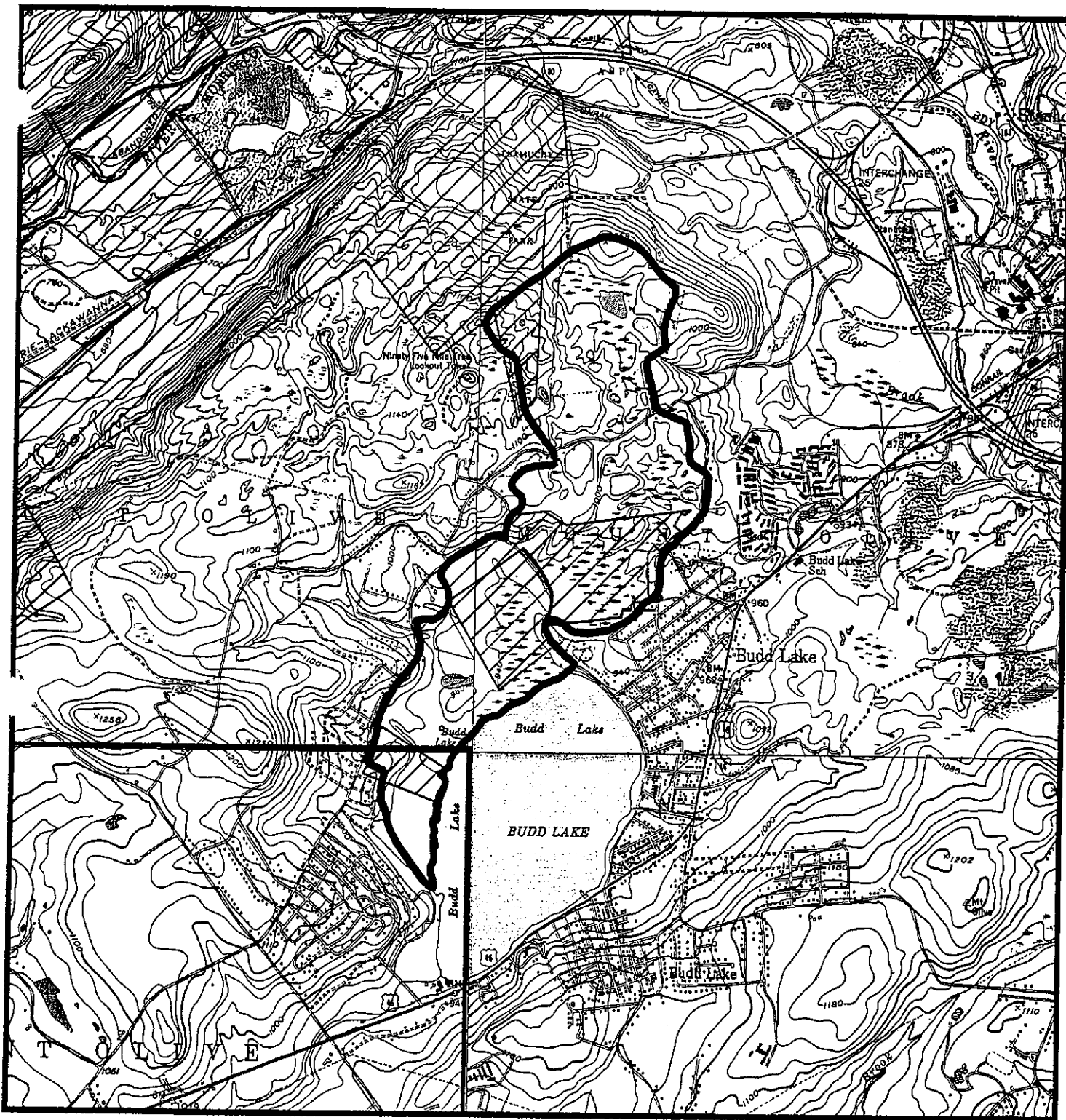
The boundaries of each Natural Heritage Priority Site are drawn to encompass critical habitat for the rare species or natural communities. Often the boundaries extend to include additional buffer lands that should be managed to protect the habitat. A justification for the boundary is provided for each site. The term "primary bounds" is sometimes used to refer to boundaries enclosing critical habitat. The term "secondary bounds" is sometimes used to refer to boundaries enclosing additional buffer. In maps where both primary and secondary boundaries are described, only the outermost boundary is provided in the mapping.

What is the background map that the sites are drawn upon?

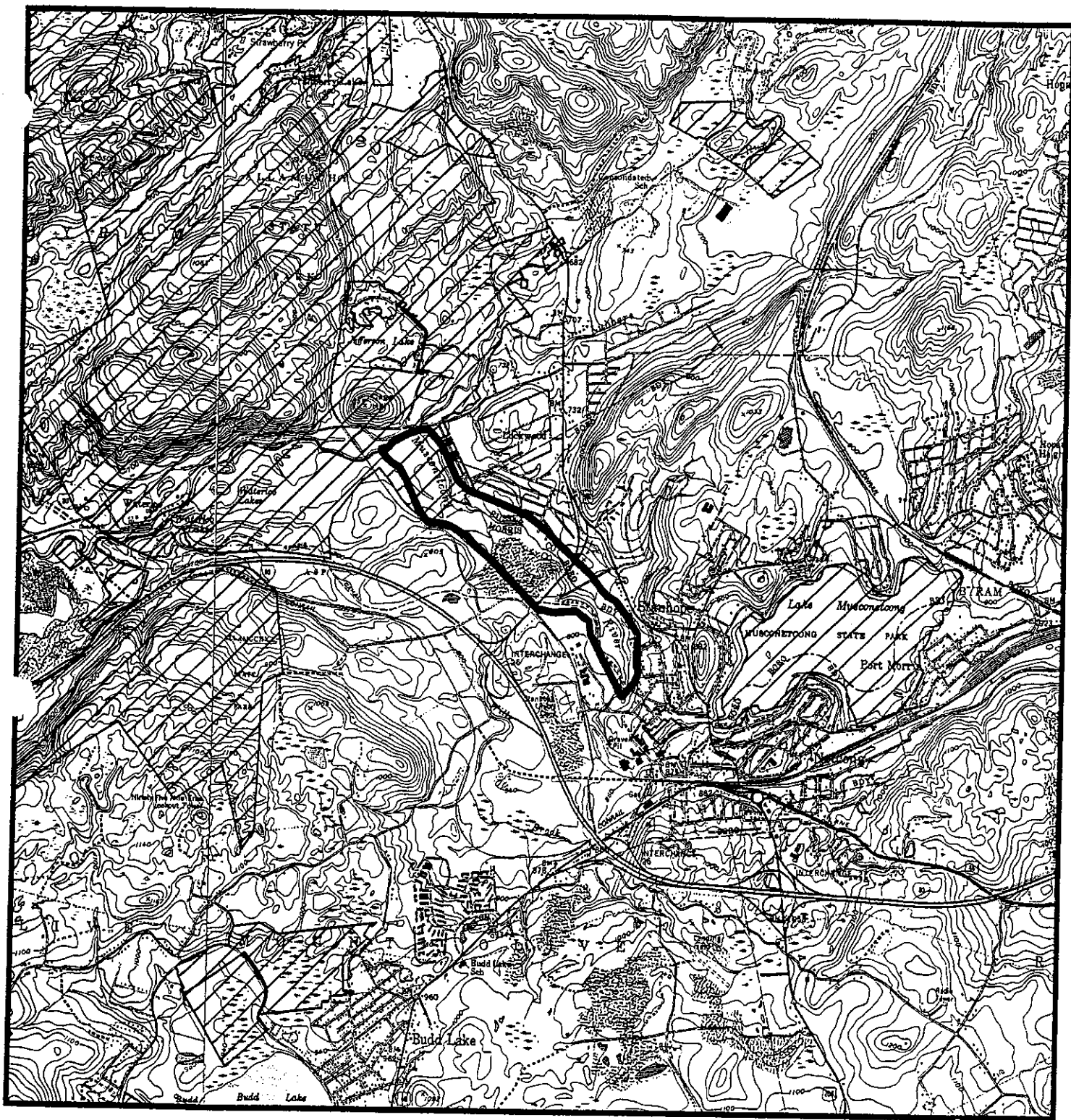
The sites are portrayed on background maps produced from a digital copy of the U.S. Geological Survey 7.5 minute topographic maps. The background maps contain topographic lines as well as streams, lakes, roads, towns and place names. These background maps do not always reflect recent changes in land development. Some may be more than 20 years old. Some sites appear to be shifted in position against this topo map. This shift is due to the fact that most sites have been digitized against a background of rectified aerial photography, and some of the digitized USGS topo maps do not align with this photography.

What do "public lands" depict on the maps?

The "public lands" shaded on these maps are state-owned open space lands that have been digitized as a GIS coverage by the state Green Acres Program. This information is provided to show patterns of State land ownership in the vicinity of the Priority Site. The public lands are areas such as State Parks and Forests, Wildlife Management Areas, and Natural Lands Trust preserves. They do not currently include lands owned by other state



Natural Heritage Priority Site
Budd Lake Bog
 Morris County



Natural Heritage Priority Site
Bridge To Nowhere
 Morris and Sussex Counties

EXPLANATIONS OF CODES USED IN NATURAL HERITAGE REPORTS

FEDERAL STATUS CODES

The following U.S. Fish and Wildlife Service categories and their definitions of endangered and threatened plants and animals have been modified from the U.S. Fish and Wildlife Service (F.R. Vol. 50 No. 188; Vol. 61, No. 40; F.R. 50 CFR Part 17). Federal Status codes reported for species follow the most recent listing.

- LE Taxa formally listed as endangered.
- LT Taxa formally listed as threatened.
- PE Taxa already proposed to be formally listed as endangered.
- PT Taxa already proposed to be formally listed as threatened.
- C Taxa for which the Service currently has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species.
- S/A Similarity of appearance species.

STATE STATUS CODES

Two animal lists provide state status codes after the Endangered and Nongame Species Conservation Act of 1973 (N.J.S.A. 23:2A-13 et. seq.): the list of endangered species (N.J.A.C. 7:25-4.13) and the list defining status of indigenous, nongame wildlife species of New Jersey (N.J.A.C. 7:25-4.17(a)). The status of animal species is determined by the Nongame and Endangered Species Program (ENSP). The state status codes and definitions provided reflect the most recent lists that were revised in the New Jersey Register, Monday, June 3, 1991.

- D Declining species—a species which has exhibited a continued decline in population numbers over the years.
- E Endangered species—an endangered species is one whose prospects for survival within the state are in immediate danger due to one or many factors – a loss of habitat, over exploitation, predation, competition, disease. An endangered species requires immediate assistance or extinction will probably follow.
- EX Extirpated species—a species that formerly occurred in New Jersey, but is not now known to exist within the state.
- I Introduced species—a species not native to New Jersey that could not have established itself here without the assistance of man.
- INC Increasing species—a species whose population has exhibited a significant increase, beyond the normal range of its life cycle, over a long term period.
- T Threatened species—a species that may become endangered if conditions surrounding the species begin to or continue to deteriorate.
- P Peripheral species—a species whose occurrence in New Jersey is at the extreme edge of its present natural range.
- S Stable species—a species whose population is not undergoing any long-term increase/decrease within its natural cycle.
- U Undetermined species—a species about which there is not enough information available to determine the status.

Status for animals separated by a slash(/) indicate a dual status. First status refers to the state breeding population, and the second status refers to the migratory or winter population.

- S2 Imperiled in New Jersey because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences, primarily because of habitat destruction. Diligent searching may yield additional occurrences.
- S3 Rare in state with 21 to 100 occurrences (plant species in this category have only 21 to 50 occurrences). Includes elements which are widely distributed in the state but with small populations/acreage or elements with restricted distribution, but locally abundant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.
- S4 Apparently secure in state, with many occurrences.
- S5 Demonstrably secure in state and essentially ineradicable under present conditions.
- SA Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded; examples include European strays or western birds on the East Coast and vice-versa.
- SE Elements that are clearly exotic in New Jersey including those taxa not native to North America (introduced taxa) or taxa deliberately or accidentally introduced into the State from other parts of North America (adventive taxa). Taxa ranked SE are not a conservation priority (viable introduced occurrences of G1 or G2 elements may be exceptions).
- SH Elements of historical occurrence in New Jersey. Despite some searching of historical occurrences and/or potential habitat, no extant occurrences are known. Since not all of the historical occurrences have been field surveyed, and unsearched potential habitat remains, historically ranked taxa are considered possibly extant, and remain a conservation priority for continued field work.
- SP Element has potential to occur in New Jersey, but no occurrences have been reported.
- SR Elements reported from New Jersey, but without persuasive documentation which would provide a basis for either accepting or rejecting the report. In some instances documentation may exist, but as of yet, its source or location has not been determined.
- SRF Elements erroneously reported from New Jersey, but this error persists in the literature.
- SU Elements believed to be in peril but the degree of rarity uncertain. Also included are rare taxa of uncertain taxonomical standing. More information is needed to resolve rank.
- SX Elements that have been determined or are presumed to be extirpated from New Jersey. All historical occurrences have been searched and a reasonable search of potential habitat has been completed. Extirpated taxa are not a current conservation priority.
- SXC Elements presumed extirpated from New Jersey, but native populations collected from the wild exist in cultivation.
- SZ Not of practical conservation concern in New Jersey, because there are no definable occurrences, although the taxon is native and appears regularly in the state. An SZ rank will generally be used for long distance migrants whose occurrences during their migrations are too irregular (in terms of repeated visitation to the same locations), transitory, and dispersed to be reliably identified, mapped and protected. In other words, the migrant regularly passes through the state, but enduring, mappable element occurrences cannot be defined.

Typically, the SZ rank applies to a non-breeding population (N) in the state – for example, birds on migration. An SZ rank may in a few instances also apply to a breeding population (B), for example certain lepidoptera which regularly die out every year with no significant return migration.

MORRIS COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN:
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
ACCIPITER COOPERII	COOPER'S HAWK		T/T		G5	S3B, S4N
ACCIPITER GENTILIS	NORTHERN GOSHAWK		E/E		G5	S1B, S4N
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMANDER		E		G5	S1
AMMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/S		G5	S2B
ARDEA HERODIAS	GREAT BLUE HERON		S/S		G5	S2B, S4N
ASIO OTUS	LONG-EARED OWL		T/T		G5	S2B, S2N
BARTRAMIA LONGICAUDA	UPLAND SANDPIPER		E		G5	S1B
BOTAURUS LENTIGINOSUS	AMERICAN BITTERN		E/S		G4	S2B
BUTEO LINEATUS	RED-SHOULDERED HAWK		E/T		G5	S1B, S2N
CIRCUS CYANEUS	NORTHERN HARRIER		E/U		G5	S1B, S3N
CISTOTHORUS PLATENSIS	SEDGE WREN		E		G5	S1B
CLEMMYS INSCULPTA	WOOD TURTLE		T		G4	S3
CLEMMYS MUEHLENBERGII	BOG TURTLE	LT	E		G3	S2
CROTALUS HORRIDUS HORRIDUS	TIMBER RATTLESNAKE		E		G4T4	S2
DOLICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2B
EURYCEA LONGICAUDA LONGICAUDA	LONGTAIL SALAMANDER		T		G5T5	S2
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	LT	E		G4	S1B, S2N
IXOBRYCHUS EXILIS	LEAST BITTERN		D/S		G5	S3B
LANIUS LUDOVICIANUS MIGRANS	MIGRANT LOGGERHEAD SHRIKE		E		G5T3Q	S1B, S1N
LYNX RUFUS	BOBCAT		E		G5	S3
MELANERPES ERYTHROCEPHALUS	RED-HEADED WOODPECKER		T/T		G5	S2B, S2N
MYOTIS LEIBII	EASTERN SMALL-FOOTED MYOTIS		U		G3	S1
MYOTIS SODALIS	INDIANA BAT	LE	E		G2	S1
NEOTOMA MAGISTER	ALLEGHENY WOODRAT		E		G3G4	S1
PANDION HALIAETUS	OSPREY		T/T		G5	S2B
PASSERCULUS SANDWICHENSIS	SAVANNAH SPARROW		T/T		G5	S2B, S4N
PODILYMUS PODICEPS	PIED-BILLED GREBE		E/S		G5	S1B, S3N
STRIX VARIA	BARRED OWL		T/T		G5	S3B

* Vertebrates

* Ecosystems

MORRIS COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
BLACK SPRUCE SWAMP	BLACK SPRUCE SWAMP				G4	S1
GLACIAL BOG	GLACIAL BOG				G4?	S1
HARDWOOD-CONIFER SWAMP	HARDWOOD-CONIFER SWAMP				G4?	S2S3
AESHNA CLEPSYDRA	MOTTLED DARNER				G4	S2S3
AESHNA MUTATA	SPATTERDOCK DARNER				G3G4	S1S2
AESHNA TUBERCULIFERA	BLACK-TIPPED DARNER				G4	S1S2
ALAS MIDONTA HETERODON	DWARF WEDGE MUSSEL	LE	E		G1G2	S1
ALAS MIDONTA UNDULATA	TRIANGLE FLOATER				G4	S3
ALAS MIDONTA VARICOSA	BROOK FLOATER				G3	S1
AMBLYSCIRTES HEGON	PEPPER AND SALT SKIPPER				G5	S1S2
ARIGOMPHUS FURCIFER	LILYPAD CLUBTAIL				G5	S2
ATRYTONE AROGOS AROGOS	AROGOS SKIPPER				G3G4T1T2	S1
BATTUS PHILENOR	PIPEVINE SWALLOWTAIL				G5	SU
BOLORIA SELENE MYRINA	A SILVER-BORDERED FRITILLARY				G5T5	S2
CELASTRINA NEGLECTAMAJOR	APPALACHIAN BLUE				G4	SU
CHLOS YNE HARRISII	HARRIS' CHECKERSPOT				G4	S2S3
CHLOS YNE NYCTEIS	SILVERY CHECKERSPOT				G5	SH
CORDULEGASTER ERRONEA	TIGER SPIKETAIL				G4	S2
CORDULEGASTER OBLIQUA	ARROWHEAD SPIKETAIL				G4	S2
ENALLAGMA BASIDENS	DOUBLE-STRIPED BLUET				G5	S3
ENALLAGMA LATERALE	NEW ENGLAND BLUET				G3	S1S2
ENODIA ANTHEDON	NORTHERN PEARLY EYE				G5	S3S4
GOMPHUS ROGERSI	SABLE CLUBTAIL				G4	S1S2
LAMPUSILIS RADIATA	EASTERN LAMP MUSSEL				G5	S3
LANTHUS VERNALIS	SOUTHERN PYGMY CLUBTAIL				G4	S2S3
LYCAENA HYLLIUS	BRONZE COPPER				G5	S2
MANDUCA JASMINIFLORUM	ASH SPHINX				G4	SU

* Invertebrates

MORRIS COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
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NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
NEONYMPHA MITCHELLII MITCHELLII	MITCHELL'S SATYR	LE	E		G1G2T1T2	SH
OPHIOGOMPHUS ASPERSUS	BROOK SNAKETAIL				G3G4	S1S2
OPHIOGOMPHUS MAINENSIS	MAINE SNAKETAIL				G4	S2
PAPAIPEMA NECOPINA	SUNFLOWER BORER MOTH				G4?	SH
PAPILIO CRESPHONTES	GIANT SWALLOWTAIL				G5	S1
POLITES MYSTIC	LONG DASH				G5	S3?
PYRGUS WYANDOT	SOUTHERN GRIZZLED SKIPPER				G2	SH
SATYRIUM ACADICUM	ACADIAN HAIRSTREAK				G5	S2S3
SATYRIUM EDWARDSII	EDWARDS' HAIRSTREAK				G4	S3
SOMATOCHLORA WALSHII	BRUSH-TIPPED EMERALD				G5	S1S2
SOMATOCHLORA WILLIAMSONI	WILLIAMSON'S EMERALD				G5	S1S2
SPEYERIA IDALIA	REGAL FRITILLARY				G3	SH
BAT HIBERNACULUM	BAT HIBERNACULUM				G?	S2
ADLUMIA FUNGOSA	CLIMBING FUMITORY				G4	S2
ANDROMEDA GLAUCOPHYLLA	BOG ROSEMARY		E		G5T5	S1
ANGELICA VENENOSA	HAIRY ANGELICA				G5	S2
ARISTOLOCHIA SERPENTARIA	VIRGINIA SNAKEROOT				G4	S3
ASPLENIUM BRADLEYI	BRADLEY'S SPLEENWORT		E		G4	S1
ASPLENIUM MONTANUM	MOUNTAIN SPLEENWORT				G5	S2
ASTER RADULA	LOW ROUGH ASTER		E		G5	S1
BOTRYCHIUM MULTIFIDUM	LEATHERY GRAPE FERN		E		G5	S1
BOTRYCHIUM ONEIDENSE	BLUNT-LOBE GRAPE FERN				G4Q	S2
CALYSTEGIA SPITHAMEA	ERECT BINDWEED		E		G4G5T4T5	S1
CARDAMINE DOUGLASSII	PURPLE BITTERCRESS				G5	S2

* Other types

* Vascular plants

MORRIS COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
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NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
CARDAMINE PRATENSIS VAR PALUSTRIS	MEADOW CUCKOO-FLOWER				GST5	S3
CAREX BRUNNESCENS	ROUND-SPIKE BROWNISH SEDGE		E		GST5	S1
CAREX DISPERMA	SOFT-LEAF SEDGE				G5	S1
CAREX HAYDENII	CLOUD SEDGE		E		G5	S1
CAREX LEPTONERVA	FINE-NERVE SEDGE		E		G4	S1
CAREX LIMOSA	MUD SEDGE		E		G5	S1
CAREX LOUISIANICA	LOUISIANA SEDGE		E		G5	S1
CAREX POLYMORPHA	VARIABLE SEDGE		E		G3	S1
CAREX SICCATA	HILLSIDE SEDGE		E		G5	S1
CAREX TYPHINA	CAT-TAIL SEDGE				G5	S3
CAREX UTRICULATA	BOTTLE-SHAPED SEDGE				G5	S2
CASTILLEJA COCCINEA	SCARLET INDIAN-PAINTBRUSH				G5	S2
CERCIS CANADENSIS	REDBUD		E		GST5	S1
CLEMATIS OCCIDENTALIS VAR OCCIDENTALIS	PURPLE CLEMATIS				GST5	S2
CUSCUTA CEPHALANTHI	BUTTONBUSH DODDER		E		G5	S1
DIRCA PALUSTRIS	LEATHERWOOD				G4	S2
EQUISETUM PRATENSE	MEADOW HORSETAIL		E		G5	S1
EQUISETUM VARIEGATUM	VARIEGATED HORSETAIL		E		GST5	S1
ERIOPHORUM GRACILE	SLENDER COTTON-GRASS		E		GST?	SH
ERIOPHORUM TENELLUM	ROUGH COTTON-GRASS		E		G5	S1
ERIOPHORUM VAGINATUM VAR SPISSUM	SHEATHED COTTON-GRASS		E		GST5	SH
GLYCERIA GRANDIS	AMERICAN MANNA GRASS		E		GST5	S2
GNAPHALIUM MACCOUNII	WINGED CUDWEED		E		G5	SH
GYMNOCARPIUM DRYOPTERIS	OAK FERN				G5	S2
HELONIAS BULLATA	SWAMP-PINK	LT	E	LP	G3	S3
HEMICARPHA MICRANTHA	SMALL-FLOWER HALFCHAFF SEDGE		E		G4	S1
HIERACIUM KALMII	CANADA HAWKWEED		E		GST?	S1

MORRIS COUNTY
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NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
HOTTONIA INFLATA	FEATHERFOIL		E		G4	S1
ILEX MONTANA	LARGE-LEAF HOLLY		E		G5	S1
KALMIA POLIFOLIA	PALE-LAUREL		E		G5	S1
LEDUM GROENLANDICUM	LABRADOR TEA				G5	S1
LEMNA TRISULCA	STAR DUCKWEED				G5	S3
LILIUM PHILADELPHICUM VAR PHILADELPHICUM	WOOD LILY				G5T4T5	S3
LOBELIA DORTMANNA	WATER LOBELIA		E		G4	SH
LUPINUS PERENNIS	WILD LUPINE				G5	S3
LYCOPODIELLA INUNDATA	NORTHERN BOG CLUB-MOSS				G5	S2
LYCOPODIUM ANNOTINUM	STIFF CLUB-MOSS		E		G5	S1
LYSIMACHIA THYRSIFLORA	TUFTED LOOSESTRIFE				G5	S3
MALAXIS BAYARDII	BAYARD LONG'S ADDER'S-S-MOUTH		E		G2	SH
MALAXIS UNIFOLIA	GREEN ADDER'S-S-MOUTH				G5	S2
MELANTHIUM VIRGINICUM	VIRGINIA BUNCHFLOWER		E		G5	S1
MILIUM EFFUSUM	TALL MILLET GRASS		E		G5	SH.1
MIMULUS ALATUS	WINGED MONKEY-FLOWER				G5	S3
MYRIOPHYLLUM VERTICILLATUM	WHORLED WATER-MILFOIL		E		G5	SH
NUPHAR MICROPHYLLUM	SMALL YELLOW POND-LILY		E		G5T4T5	SH
NYMPHOIDES CORDATA	FLOATINGHEART			LP	G5	S3
OBOLARIA VIRGINICA	VIRGINIA PENNYWORT				G5	S2
PANICUM BOREALE	NORTHERN PANIC GRASS		E		G5	S1
PHLEGOPTERIS CONNECTILIS	NORTHERN BEECH FERN				G5	S2
PHLOX PILOSA	DOWNY PHLOX		E		G5T5	SH
PLATANTHERA HOOKERI	HOOKEE'S ORCHID		E		G5	S1
PLATANTHERA PSYCODES	PURPLE FRINGED ORCHID				G5	S2
POTAMOGETON ALPINUS	NORTHERN PONDWEED		E		G5	S1
POTAMOGETON ILLINOENSIS	ILLINOIS PONDWEED		E		G5	S1
POTAMOGETON ORTUSIFOLIUS	BLUNT-LEAF PONDWEED		E		G5	S1
POTAMOGETON ROBBINSII	ROBBIN'S PONDWEED		E		G5	S2

MORRIS COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
POTAMOGETON ZOSTERIFORMIS	EEL-GRASS PONDWEED		E		G5	S1
POTENTILLA ARGUTA VAR ARGUTA	TALL CINQUEFOIL				G5T?	S3
POTENTILLA PALUSTRIS	MARSH CINQUEFOIL		E		G5	S1
PRENANTHES RACEMOSA	SMOOTH RATTLESNAKE-ROOT		E		G5T?	SH
PRUNUS ALLEGHANIENSIS	ALLEGHENY PLUM		E		G4T4	S1
PRUNUS PUMILA VAR DEPRESSA	LOW SAND CHERRY				G5T5	S2
PYCNANTHEMUM TORREI	TORREY'S MOUNTAIN-MINT		E		G2	S1
RANUNCULUS AMBIGENS	WATER-PLANTAIN SPEARWORT				G4	S2
RANUNCULUS FASCICULARIS	EARLY BUTTERCUP		E		G5	S1
RANUNCULUS PUSILLUS VAR PUSILLUS	LOW SPEARWORT				G5T4?	S2
RHODODENDRON CANADENSE	RHODORA		E		G5	S1
SALIX LUCIDA SSP LUCIDA	SHINING WILLOW				G5T5	S1
SALIX PEDICELLARIS	BOG WILLOW		E		G5	S1
SCHUCHZERIA PALUSTRIS	ARROW-GRASS		E		G5T5	SH
SMILACINA TRIFOLIA	THREE-LEAF FALSE SOLOMON'S-S-EAL		E		G5	S1
SOLIDAGO RIGIDA	PRAIRIE GOLDENROD		E		G5T5	S1
SPARGANIUM ANGUSTIFOLIUM	NARROW-LEAF BURR-REED		E		G5	SH
SPARGANIUM MINIMUM	SMALL BURR-REED		E		G5	S1
SPOROBOLUS NEGLECTUS	SMALL RUSH-GRASS		E		G5	S1
STELLARIA BOREALIS	BOREAL STARWORT		E		G5T5	S1
TIARELLA CORDIFOLIA	FOAMEFLOWER		E		G5T5	S1
TRIADENUM FRASERI	FRASER'S ST. JOHN'S-WORT		E		G4G5	S3
TRIPHORA TRIANTHOPHORA	THREE BIRDS ORCHID		E		G3G4	S1
TROLLIUS LAXUS SSP LAXUS	SPREADING GLOBE FLOWER		E		G4T3	S1
UTRICULARIA INTERMEDIA	FLAT-LEAF BLADDERWORT				G5	S3
UTRICULARIA PURPUREA	PURPLE BLADDERWORT			LP	G5	S3
VERBENA SIMPLEX	NARROW-LEAF VERVAIN		E		G5	S1

1 SEP 2001

MORRIS COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
VIOLA BLANDA VAR PALUSTRIFORMIS	LARGE-LEAF WHITE VIOLET				G4G5T4T5	S3
VIOLA CANADENSIS	CANADIAN VIOLET		E		G5T?	S1

14 Records Processed

ORDINANCE No.: 14-2003**Amended 3/14/03****AN ORDINANCE OF THE TOWNSHIP OF MOUNT OLIVE
AUTHORIZING AND ADOPTING A STORMWATER MANAGEMENT PLAN FOR
THE TOWNSHIP OF MOUNT OLIVE**

WHEREAS, A Municipal Stormwater Management Plan (the "Plan") has been developed to address the key issues of flooding, water pollution and public safety related to the impacts of stormwater on the Township of Mount Olive; and

WHEREAS, the Plan conforms to all relevant Federal and State statutes and rules to include local rainfall intensity curves used in storm water management design criteria in accordance with the Residential Site Improvement Standards (RSIS) and or substituted by published local frequency data, when available which address stormwater management, dam safety, water pollution and flood control; and

WHEREAS, an additional goal of the Plan is to ensure it is consistent with any other plans which deal with stormwater issues as well as with the goals and strategies of the State Development and Redevelopment Plan and;

WHEREAS, the specific goals of this Plan are to:

- a) Reduce flood damage, including damage to life and property;
- b) Minimize stormwater runoff from new development projects where such runoff will increase flood damage;
- c) Reduce soil erosion from any development or construction project;
- d) Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
- e) Induce water recharge into the ground where practical;
- f) Prevent to the greatest extent feasible, an increase in nonpoint pollution;

- g) Maintain the integrity of stream channels for their biological functions, as well as for drainage;
- h) Minimize pollutant in stormwater runoff from new and existing developments in order 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 use of water;
- i) Protect public safety through the proper design and operation of stormwater management basins; and
- j) Ensure adequate maintenance procedures have been established and implemented to ensure that the stormwater management measures fulfill their intended functions.

WHEREAS, the Township Planning Board shall adopt the Stormwater Management Plan as an integral part of its Master Plan by the time the next reexamination of the Master Plan is due; and

WHEREAS, within one (1) year after the Stormwater Management Plan is adopted the Township will adopt a Stormwater Control Ordinance to implement the Plan; and

WHEREAS, once both the Stormwater Management Plan and Stormwater Control Ordinance is adopted same will be submitted to Morris County for review and approval; and

WHEREAS, the Township Council agrees that the Stormwater Management Plan should be adopted for the above mentioned reasons.

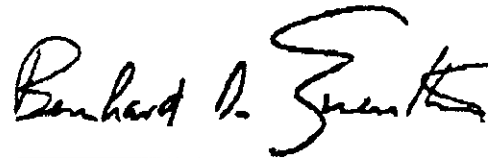
NOW THEREFORE BE IT ORDAINED by the Township Council of the Township of Mount Olive, County of Morris, as follows:

Section 1. The Township of Mount Olive does hereby adopt the Stormwater Management Plan prepared by Schoor Depalma Inc., entitled "Stormwater Management Plan for the Township of Mount Olive" of which ten (10) copies are on file with the Township Clerk

Section 2. This Ordinance shall take effect in accordance with law and adopts by reference the above mentioned Stormwater Management Plan pursuant to and in accordance with N.J.S.A. 40:69A-181.

ATTEST: 4/8/03


Lisa M. Lashway
Mount Olive Township Clerk


Bernhard D. Guenther
Mount Olive Twp. Council President

ORDINANCE #14-2003

**AN ORDINANCE OF THE TOWNSHIP OF MOUNT OLIVE
AUTHORIZING AND ADOPTING A STORMWATER MANAGEMENT PLAN FOR
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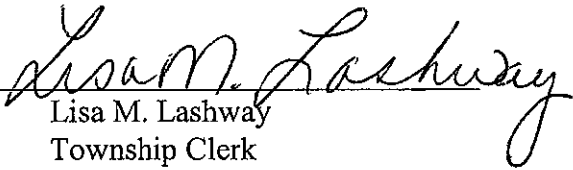
WHEREAS, once both the Stormwater Management Plan and Stormwater Control Ordinance is adopted same will be submitted to Morris County for review and approval; and

WHEREAS, the Township Council agrees that the Stormwater Management Plan should be adopted for the above mentioned reasons.

NOW THEREFORE BE IT ORDAINED by the Township Council of the Township of Mount Olive, County of Morris, as follows:

Section 1. The Township of Mount Olive does hereby adopt the Stormwater Management Plan prepared by Schoor Depalma Inc.

I, Lisa M. Lashway, Township Clerk of the Township of Mount Olive do hereby certify that the attached Ordinance #14-2003 was passed after first reading on February 25, 2003, and is scheduled for public hearing and adoption on March 11, 2003.


Lisa M. Lashway
Township Clerk

TOWNSHIP CLERK'S OFFICE
Mount Olive Township
P.O. Box 450
Budd Lake, NJ 07828

PHONE: (973) 691-0900 EXT. 290

FAX: (973) 691-2080

FACSIMILE TRANSMITTAL

TO: Robin Nellissen
COMPANY: Schoor Depalma
FROM: Michelle Massei

FAX: 732-577-
DATE: 9888

TOTAL # OF PAGES (INCLUDING) COVER SHEET: 4/

Ord. 14-2003

Section 2. This Ordinance shall take effect in accordance with law.

ATTEST:

Lisa M. Lashway
Mount Olive Township Clerk

Bernhard D. Guenther
Mount Olive Twp. Council President

Management of Canada Geese in Suburban Areas

A Guide to the Basics

DRAFT



NJ Department of Environmental Protection
Division of Watershed Management

March, 2001

DRAFT

Management of Canada Geese in Suburban Areas

A Guide to the Basics

State of New Jersey

Donald T. DiFrancesco, Acting Governor

New Jersey Department of Environmental Protection

Robert C. Shinn, Jr., Commissioner

Division of Watershed Management

Mary Sheil, Director

Acknowledgement:

This guidance document consists of a compilation of the most current available information. Consult the reference section for sources. The document does not reflect an official policy position of the Division, but rather serves to provide basic technical guidance on Canada goose management options.

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Introduction

The honking flock of Canada geese overhead brings an internal recognition of nature's intelligence and the timeless changing of the seasons. The high altitude, gracefully shifting 'V' formation always is a source of wonder. Years ago, these sights and sounds were the primary evidence of the flocks.

In many locations along the Atlantic Flyway, which extends from Hudson's Bay, Canada south to Mexico, Canada geese are not abundant. But in New Jersey and several other northeastern states, times have changed. In many areas, resident or non-migrating 'Giant' Canada goose populations are increasing dramatically. In fact, some population projections indicate that the numbers of non-migrating Canada geese may *double* in the next six years.

Many people enjoy the sight of a *few* geese. The problems begin when the numbers of non-migrating birds increase, including:

- overgrazing of turfgrass, which impacts aesthetics and creates an erosion hazard
- grazing of cropland, increasing erosion hazard and crop losses
- accumulations of fecal material on land, creating a health risk
- degraded water quality, from fecal bacteria and elevated nitrogen and phosphorous
- hazards to aircraft at airports
- attacks on humans

Many people do not realize that 'Giant' Canada goose populations were nearly non-existent by the early years of the 1900's because of unrestricted harvesting of eggs, draining of wetlands for crop production, and commercial hunting. Strict harvest regulations were enacted, refuges were established, large acreages of turfgrass were established through human sprawl, and goose populations recovered rapidly and dramatically. It is ironic that we did our job so well that now reducing the populations is a critical water quality concern.

This manual provides the most current effective methods known for reducing the impacts 'Giant' Canada geese can have on a specific site or water body. The reader should understand that no single method will be successful in every situation and the best approach likely will be a combination thereof. Canada geese are highly adaptable and possess a short learning curve. Size of the resident flock, site conditions, adjacent land use and social acceptance all will impact the flock control choices available.

Management recommendations in this Guide are referring throughout to the resident 'Giant' Canada goose.

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Chapter One: Understanding the Resident Canada Goose

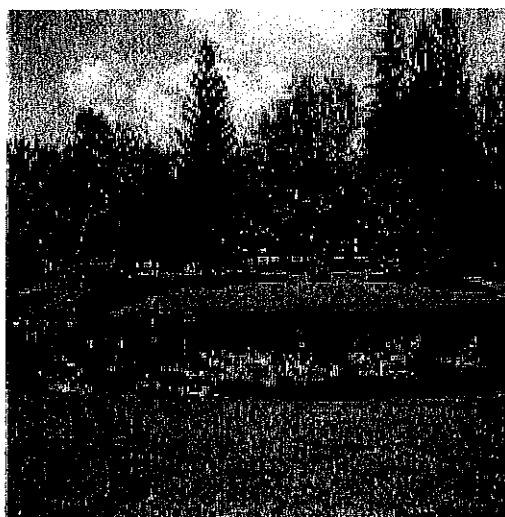
The Canada Goose, (*Branta canadensis*) usually begins nesting at three years of age. Pairs usually stay together for life unless one dies. If that should occur, the other usually will find a new mate within the same breeding season. Since geese can live as long as 20 years, there are many offspring produced by a pair.

'Giant' Canada Geese differ from the seasonally migrating 'Interior' Canada goose. These birds can be up to six pounds heavier, adapted to urban environments, tolerant of humans, and have a very limited migration range. Currently, the number of resident Canada geese is estimated at 83,000.

These birds have two basic requirements: *fresh water* for drinking, resting, nesting and escape from predators; and *tender, succulent vegetation* for food. The plentiful, highly managed lawns of residential neighborhoods, corporate office campuses, golf courses, parks, and some airports provide preferred habitats for these birds.

Canada geese nest within 100 feet of open water - usually directly adjacent. In New Jersey, nesting occurs in mid-April. The nest consists of a large mound of vegetation such as grass and cattails, is concave, nearly two feet

in diameter, and lined with soft down originating from the female's breast. Along with proximity to water, the other critical nest location factor is having a good view of the surroundings, for predators. Egg laying usually follows immediately after the nest is constructed. An egg is laid about every two days.



Geese taking flight

4 to 7 eggs make up a typical clutch and incubation is done completely by the female. The male will stand closely and defend the female by striking with its wings and nipping. The incubation period is 25-30 days. Interestingly, incubation does not begin until all of the eggs are laid, so that all goslings hatch the same day.

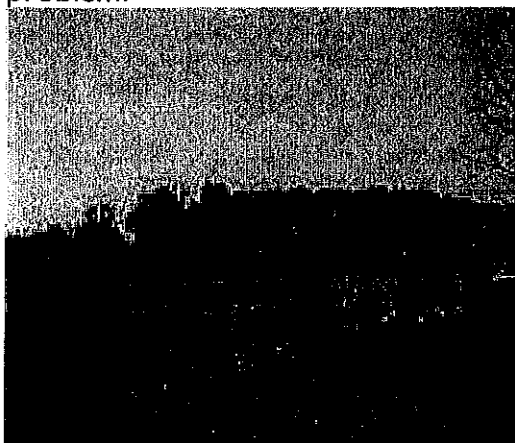
If the nest or eggs are destroyed, Canada geese will likely re-nest in the same spot. However, timing is critical when re-nesting is concerned. If the eggs or nest are lost more than one week after the start of incubation, re-nesting may not occur. The newly hatched goslings

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are led to water within one day after hatching.

The gander's behavior changes markedly after hatching. He previously would have chased off any other geese in the area. Now, 'overnight' he becomes much more tolerant of them. In fact, if there happen to be other clutches of goslings nearby, they will often group together in flocks and be looked after by the adults. At 10 weeks, the goslings can fly, and begin to adopt most of the adult behavioral characteristics.

Canada geese are grazers. As such, they have a clear preference for tender, mowed and fertilized turf grasses. They prefer to feed in large open areas with few obstructions that give a 360° view of potential predators. These birds have a high tolerance for humans and adapt quickly. Thus, the perfect feeding spot that meets all requirements of the geese is a nice, green, managed lawn area near water...conditions many humans prefer. Hence, the problem.



Geese browsing stormwater basin

Adult Canada geese undergo a complete replacement of their feathers (molting) starting each June, and it lasts about 30-35 days. During the molting period, the birds are unable to fly and are vulnerable. During this period, roundup and capture of small flocks of geese is possible.

Migration of Canada geese nesting in the United States covers relatively short distances, usually not extending past adjoining states. Smaller, Canadian-nesting breeds will migrate south after August 30 to the northern states. Some of these migrating birds will temporarily join urban resident flocks in New Jersey, greatly swelling their numbers. This can create a sudden negative impact on the local plant and water resources.

Canada geese have a remarkable homing instinct, returning each year to the previous nesting site if it was to their liking. This, coupled with their typically long lifespan, compounds the problem of goose-related water quality trouble spots.

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Chapter Two: Methods to Manage Canada Geese in Suburban Areas

Generally, the best approach to suburban goose management amounts to a combination of methods- an integrated approach. When choosing appropriate methods, three important factors need to be considered:

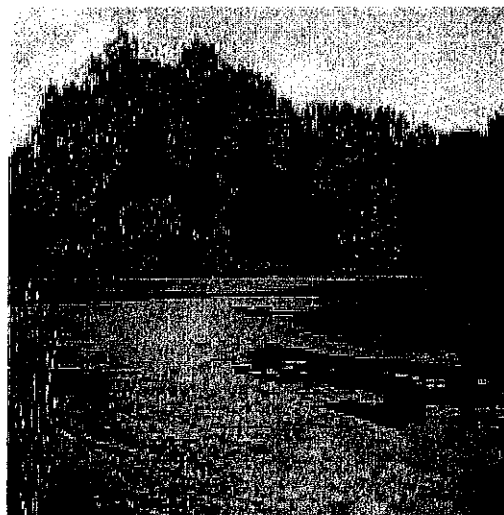
- the characteristics at the site that attract geese (food, water, secure nesting)
- the human attitudes and behaviors that attract and protect the geese
- laws and regulations

A management approach is devised based on reducing the preferred site characteristics. This usually means altering human behavior while being respectful toward attitudes. Without this approach, a control program is destined for failure.

The Human Element

Public attitudes toward geese often conflict, juxtaposing environmental needs with personal belief systems regarding wildlife protection and welfare. Suburban areas contain increased populations, and different groups will define 'nuisance' from geese differently. People have differing tolerances for goose droppings, noise, vegetation damage, fouled waters, and occasionally aggressive behavior. Any method that involves destruction of birds, eggs, or nests will often

create a highly emotionally charged atmosphere. In extreme situations, law enforcement personnel can be necessary to preserve public safety if a confrontation is anticipated between the public and the goose management team.



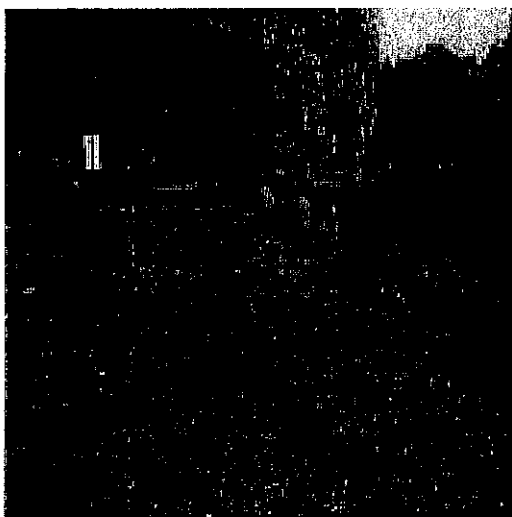
Algae from excess phosphorous

Usually, the first step in reducing these types of conflicts is education. Many people are completely unaware of the environmental degradation that can result from dense non-migrating Canada goose populations. A second step that has been successful is the establishment of citizen task forces. These groups provide a means for concerned stakeholders to become actively involved in educating others and shaping the management strategy.

The actual goose management team charged with developing and implementing the control strategy should be adept at responding to the public in a non-defensive and positive way. They should be able to clearly explain (bilingually, if

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necessary) the reason for the control actions. Permits must be present on the site at the time of strategy implementation. These people, who will usually be agency personnel, should have clear guidance from their agency and an experienced local leader at the sites where population management measures will take place.



Overbrowsing of vegetation by geese

Developing the Strategy

The integrated management strategy should consider:

- local community support for the need to take action
- available control options, given the biology of Canada geese and the characteristics of the site
- relative effectiveness of the techniques
- cost, regulatory considerations, and social acceptability of the techniques
- time of year when the resident goose population is greatest

In most cases, it has been learned that there is no single control method that will work every time, everywhere. There may have to be a combination of short term and long term controls in order to have a successful program. Additionally, the methods may be designed to address an existing problem and to prevent a future one from occurring.

An existing goose problem should be evaluated similar to agricultural integrated pest management. The goose management team should determine the 'damage threshold'. That is, the number of geese or the extent of environmental impact that is sufficient to warrant the implementation of controls. Then, actual population reduction and harassment measures may be appropriate along with reduction of goose preferred site conditions (habitat).

An anticipated future goose problem may utilize control methods directed completely toward habitat management.

When complete, the integrated management strategy should be shared with the public and distributed to all stakeholders.

Current Regulatory Status

Canada geese are protected by a number of regulations, primarily the Migratory Bird Treaty Act of 1918. This federal act made it an illegal action to harvest waterfowl or other

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migratory birds except during the hunting season or by permit. The Act prevents unrestricted commercial hunting for meat and feathers that was widespread in the United States. Unrestricted egg harvesting was also prohibited by the Act.

This landmark legislation gave the U.S. and Canadian governments the authority to set limits, implement appropriate regulations, and issue permits to take waterfowl. The U.S. Fish and Wildlife Service of the U.S. Department of the Interior administers and enforces the Act. Other New Jersey regulations that support this Act are the NJ Statutes Annotated Title 23, and the NJ Game Code enforced by the NJ Division of Fish, Game and Wildlife.

In June 1999, The USF&WS ruled to give states the authority to develop a management plan to take action on nuisance resident Canada geese.

Concurrently, the USF&WS began work on an Environmental Impact Statement pertaining to this issue. Procedures designed to directly impact the Canada goose population such as handling nests and eggs, capturing and relocating geese, capturing and euthanizing geese, shooting, and any other activity that involves handling geese, their eggs, and nests requires a depredation permit. The permit application is available from the USDA APHIS Wildlife Services or the U.S. Fish and Wildlife Service.

Canada Goose Management Techniques

Stop all feeding

Efforts to reduce goose populations are often concurrently undermined by 'the people next door' feeding the birds. If feeding of the geese is commonplace, there is no point in trying to scare the birds away.

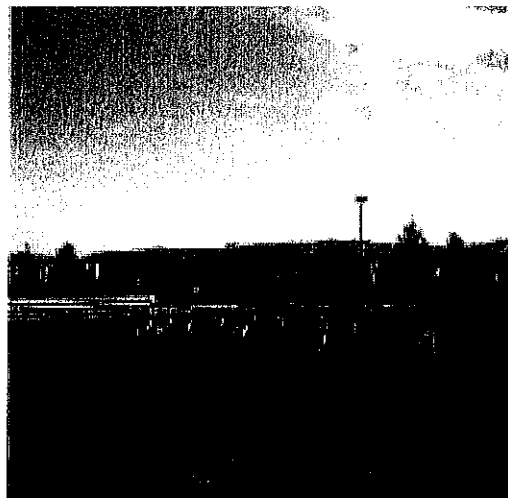
Canada geese do not need to be fed.

Natural foods are abundant.

Feeding geese concentrates birds near roads and heavy human use areas, creating a safety hazard.

Feeding often results in geese becoming more tame and ultimately more aggressive toward people.

Feeding, because it increases crowding of an area so rapidly, increases susceptibility of the birds to diseases like duck plague, avian cholera, and avian botulism. These all can kill large numbers of birds as well as other more desirable waterfowl.



Geese in mall parking island

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Education of the public and signage at known concentration spots discouraging feeding is the first step. If the results are unsatisfactory, a 'No-Feed' ordinance may be warranted, accompanied with fines for repeat offenses.

Hazing

Hazing of Canada geese refers to simply scaring or harassing them into leaving the area. Hazing is allowed without a permit provided the birds are not actually handled by a person or attacked by a dog. Hazing is usually not harmful to the geese; consequently some methods are highly acceptable to the public. The major negative is that because the Canada goose is so adaptable, it rapidly becomes accustomed to the hazing and is no longer frightened away.

Hazing should be used as soon as it becomes apparent that geese are beginning to congregate in a particular area. Once a large number of birds have 'settled' into an area, it becomes increasingly difficult to haze them out.

In general, all hazing methods are made more effective by elimination of habitat elements that the Canada geese find attractive at the site.

Noisemakers:

For obvious reasons, these loud devices may not be acceptable near people. They have been used most

successfully in agricultural settings. Noisemakers often consist of some form of *pyrotechnics* such as:

- Propane cannons
- Bangers and screamers
- Firing blanks
- Sirens, airhorns, and whistles
- Recorded goose distress calls

Each of these methods may be successful for a time, but geese quickly become habituated to noisemaking, especially if used alone. If proper permits are secured, shooting of several birds can increase the effectiveness of the noisemaking.

Automatic devices usually are preferred. If the devices cannot be triggered automatically, the labor necessary to activate them will add greatly to the cost of the goose abatement program.

Consult with your local police department and comply with all use restrictions. Inform your neighbors, too, since these sounds can be quite startling. For more information on the safe use of pyrotechnics, obtain information from the USDA-APHIS Wildlife Services program.

Visuals:

Visual frightening devices have the advantage of doing the job quietly, so they may be better adapted to suburban applications. They are also relatively inexpensive, safe, and work well with other hazing techniques. On the flip side, they may be visually offensive to people,

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may be vandalized often, and require constant checking and upkeep. Some common visual hazing methods are:

- Mylar tape (scare tape): Scare tape is red on one side, silver on the other, about 1/2 inch wide. It can be used as a streamer if the geese fly in to the site or in a fence arrangement on 3' tall stakes if the geese walk in. When properly implemented, the tape flashes in the sun and vibrates & rattles in the wind. Obviously, on a mostly cloudy, calm day, its effectiveness is greatly diminished. Also, deer, dogs, and children will break a fence arrangement routinely, requiring constant repair.
- Flags: Flags placed in windy locations in farm fields and near water bodies have been used to discourage geese from landing. Flags may consist of:
 - heavy gauge garbage bags cut with slits on top of 8' tall poles
 - six foot long and 24" wide mylar strips on top of 6 foot poles
 - a six foot tall cross- pole with a large plastic bag attached over the cross forming a scarecrow of sorts
- Eye-spot balloons: These are large, 18"-36" diameter inflatable balls that are decorated with large owl-type eyes. The most effective eye-spot designs are those that have pupils inside the eyes and are colored. These balloons can be tethered between

poles or trees, or filled with helium and tethered 15 – 20 feet above the ground.

Care must be taken to place the balloons far enough away from trees and wires that the lines will not tangle and the balloons will not puncture.

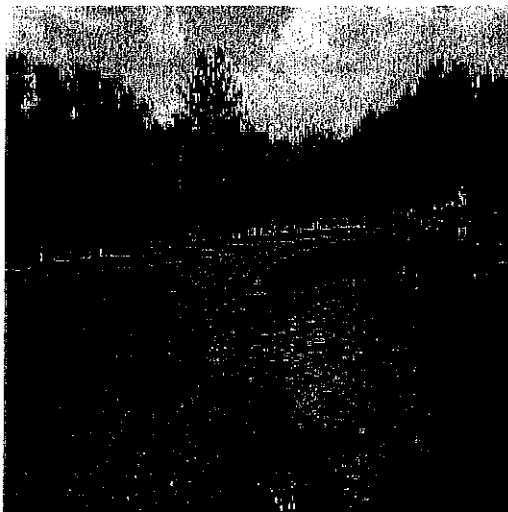
- Scarecrows: Scarecrows resembling humans with moving arms can scare geese away from small areas. Interestingly, research shows that scarecrow effectiveness increases when coupled with noisemaking (propane cannon) and a replica shotgun being held by the scarecrow (Smith, et. al). Another form of scarecrow that occasionally is effective are those that depict waterfowl themselves. Canada goose decoys with stretched necks (alarm position) can work.
- Remote controlled (RC) aircraft: This method of hazing has been used successfully in the past, primarily at airports. One study at the Reno, Nevada airport showed that by the third day of RC aircraft use, the geese took flight as soon as the aircraft left the ground. After the use of RC aircraft ceased, it took 10 days for the geese to return. This technique has also been used successfully at Auckland, NZ and Tel Aviv, Israel airports. This method can be expensive and labor intensive. However, RC aircraft flying is a popular hobby and often, local clubs exist that

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may be interested in using their skills to help to haze geese away from a particular location.

Dogs, Swans, and Falcons

Dogs, usually trained border collies, can be highly successful in hazing. They have been deployed with good results at golf courses and corporate areas. The dogs must be under the supervision of a trained handler. They may be attached to a long lead; allowed to free roam (with an 'invisible fence'); or simply brought in periodically and released to chase the flock away. The best times to use dogs are during spring, to reduce nesting; and in early fall after molting. Dogs cannot be used during the molting period for humane reasons. If dog harassment is ceased for a short period, the geese will often return to reestablish themselves at the site.



Preferred goose habitat: mowed shoreline

Although swans can be territorial and aggressive toward Canada geese, in the long run this is not a preferred

method of hazing. Swans can create some of the same problems created by geese. Generally, swans are not recommended.

Trained falcons have been used successfully to haze geese at airports, locally at McGuire Air Force Base and JFK International Airport in New York. Geese at airports are a serious hazard, causing a fatal crash in Alaska in 1995 when several were sucked into engines of an AWACS plane. Falcons are predators, and are recognized and respected by the geese as such. Usually, however, additional hazing measures such as pyrotechnics and propane cannons are necessary.

Altering of Habitat

As stated earlier, the habitat most desirable to geese is a large, flat to gently rolling managed turf area close to a lake, pond, or slow moving watercourse. Many land uses in suburbia provide this environment: large corporate campuses, suburban lawns, commercial centers, parks, and golf courses.

Habitat alteration consists of eliminating, modifying, or reducing access to areas that provide attractive spots for geese. The irony here is that this often creates a problem for the public, because access to lawn areas adjacent to water is also highly desirable to most humans. In fact, surveys have indicated that people in general are reluctant to perform the habitat

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modifications necessary to have a significant impact on resident goose populations. A 1991 British Columbia survey showed that 84% of respondents opposed such measures. (Smith, et.al)

Habitat modification is most effective before geese have established themselves in an area. If the desirability of a site is reduced before a non-migratory population establishes itself, chances are far better of avoiding a problem. Once a flock of geese is settled in an area, however, other measures coinciding with habitat work are needed. Although initial expense for habitat alteration may be higher than other measures, in the long run it is often the most cost effective solution.

Habitat alteration should not be done at a single location if other similar desirable habitats exist within a short distance. Coordination between stakeholders is essential to ensure that a more widespread approach is taken. Otherwise, the geese may simply vacate one spot and increase the density at the next desirable site in the area.

Athletic fields with heavily managed turf should be kept at least 400 feet away from the water's edge. This will, however, only have a big impact during molting season. During times when geese can fly, they will routinely utilize turf areas a mile or more away from the water.

Reducing adjacent turf

Canada geese prefer lush, mowed turf. The mowing and continual fresh, succulent high carbohydrate regrowth of the grass provides preferred food. In New Jersey, turf grasses usually consist of cool-season varieties of bluegrass, ryegrass, and fescues. One way to reduce the palatability is to simply reduce or eliminate fertilizer application and watering. If grass is allowed to grow to higher lengths, the tender young shoots become more difficult for the geese to detect, being below the older, tougher, more fibrous growth. A mowing height of 8 inches will reduce the attractiveness of the grass to the geese.



Shoreline buffer of tall vegetation

A more comprehensive measure is to change the grass cover to a mixture of warm season grasses like switchgrass, bluestems, wheatgrass, and indiangrass combined with wildflowers.

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This, in essence, mimics a prairie ecosystem, and is not preferred by geese. This type of vegetation will require far less mowing and maintenance and often is visually attractive if implemented in a natural, curvilinear design blending with the natural contours. One caution: although tall vegetation will not be browsed for food, it may provide adequate nesting sites to some geese.

Another approach to reduce the area of turf is to convert it to non-palatable ground covers. Common plants not preferred by Canada geese include: periwinkle (*Vinca spp.*); myrtle (*Myrtus spp.*); pachysandra (*Pachysandra terminalis*); English ivy (*Hedera helix*); and hosta (*Hosta spp.*).

Barrier fencing

Fencing is an effective method for excluding walking geese from a lawn area. Fencing can be made of mylar tape, woven wire, chicken wire, plastic construction fence, electric 2-wire, chainlink, rock, or other suitable materials. Openings in the fencing should be no larger than 3 inches and must be at least 24 inches tall. The fencing must also extend far enough to prevent the geese from simply walking around the ends.

Fences have been found to be most effective during limited flight periods: pre-nesting, molting, and when there are new goslings. The effectiveness of a fence barrier is

often enhanced by a vegetative shoreline buffer (*see vegetative buffer section*).

If the fence is made from smooth wire, rope, or heavy monofilament line, it should have at least three strands set at 12, 18, and 24 inches above the ground. Support stakes should be close enough to prevent sagging – no more than 10 feet apart.

Rock barriers

When geese leave a water body, they generally use routes that allow them easy access to land and a clear view. Large (2-3 ft. diameter) boulders placed along the shoreline can act as a barrier to geese trying to access the land around the water. These boulders, especially if used in conjunction with taller shoreline vegetation, can enhance the visual interest of the water's edge.

Vegetative Buffers

Changing the landscape of a site is generally considered to be the most effective, humane, and environmentally friendly long-term goose management technique. Since a highly managed turf near water is the ultimate for geese, the best choices are changing the surrounding turf; or changing the water-turf interface, the shoreline.

Generally, Canada geese avoid feeding, nesting, and loafing in areas where tall vegetation provides an obstruction to the surrounding areas. An important secondary benefit of

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this method is that the vegetation, usually consisting of tall native adapted grasses, shrubs, and trees, will help to act as a filtering buffer, removing pollutants contained in storm runoff flowing from the adjacent area to the water body.

The vegetation must be at least 24 inches high and dense enough to prevent the geese from seeing through it. Tall, stiff stemmed native warm season grasses are good choices. Shrubs should be native species also, and adapted to the conditions of the site. The vegetative barrier should be at least 25 feet wide. Creating a narrow S-shaped path will allow human access to the water's edge, while still obscuring its view. If desired, this path can access another narrow footpath running along the actual shoreline. Having a shoreline path inside of the vegetative barrier can provide a means of hazing and disruption to the geese. If a shore footpath is put in place, be sure to stabilize the shoreline to prevent bank erosion.

Taller native adapted trees can also be used with the grasses and shrubs to screen the shoreline. The trees should be spaced adequately to allow for their mature size. They should also be spaced so that a dense shade canopy does not form- the understory grass and shrub vegetation will need a good deal of sun.

Straight Shoreline Elimination

Long, straight shorelines and islands are optimum nesting locations for Canada geese, providing security and a clear view of possible predators. Islands are difficult and expensive to remove once a lake is filled with water. Additionally, people often find islands to be visually appealing. Typically, the most efficient way to deal with island nesting sites is through hazing.



Wooded pond island

Shoreline modification can also be quite expensive, requiring large equipment and, often, permits from the NJDEP. The idea is to eliminate or drastically reduce the long uninterrupted shore view that geese prefer. Creation of peninsulas and coves with short-radius curves will shorten the distance that geese can see in all directions. This, coupled with fence or rock barriers and tall shoreline vegetation can reduce the attractiveness of a water body to the geese. This may also make conditions more aesthetically

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favorable for sections of shoreline trails and benches.

Overhead lines

A network of multiple parallel lines or a grid of heavy (10 gauge minimum) wire or twine stretched 2 to 3 feet above a water surface or feeding area restricts goose landing. The parallel lines can be 20 to 75 feet apart and do not have to be spaced equidistant. A grid arrangement can range from 10 to 30 feet square. The overhead system can be visually emphasized with the addition of mylar tape streamers attached at wide intervals. Fencing should be installed at the perimeter of the area being protected by the overhead lines to prevent geese from walking in underneath.

Any overhead line system should be in place before geese discover a site for the season. Maintenance is necessary to prevent sagging or to replace broken lines.

Overhead line systems have some obvious negative effects - they cannot treat a large area; they are visually distracting and unappealing; they can greatly restrict human access to the water; and the risk exists for bird entanglement, injury and death.

Repellents

There are several Canada goose repellents that can be effective for limited times. The repellents are sprayed on the turf before geese return for the season. Repellents do

not harm geese and are usually accepted by the public. The active ingredient is methyl anthranilate, which is made from natural biodegradable food grade ingredients and is non-toxic to humans, dogs, cats, or birds. Methyl anthranilate is a chemical that makes the grass unpalatable to the geese. It generally does not persist, although its effects can endure longer if fogged into an area rather than sprayed.

Generally, for best results repellents should be applied only to dry and just mowed turf, in full sun, at temperatures over 50° F. 2-3 hours of drying time must be allowed after application. Applications generally should be repeated every 4-5 days; if rain falls within 24 hours after application, it may have to be repeated.

Direct Population Impact Measures

Goose Removal

There are several clear advantages to physical removal of Canada geese from a problem site. Removal is applied directly to impact a population problem, the effects are immediate, and less risk exists that the geese will move and create problems elsewhere. Relocating or killing of geese outside of legal hunting seasons requires permits. In addition, killing of geese often stirs local controversy.

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Nets

Some removal techniques require the capture of live geese. This is done during the flightless, molting season in early to mid-summer. They are then easily rounded up by driving them into special nets. The net should be set up on a dry, flat area away from roads or other areas where the geese could be injured.

Geese inhabiting farm pond



The capture net should be 48-60 inches tall and made of a non-abrasive material so that the geese are not injured by it during the process. Generally, poles are erected every 12-15 feet for support of the net, which is in an upright position. The net is arranged in a tight, semi-circular orientation with an opening large enough to get the geese in but small enough to keep them in. Wildlife personnel herd the geese into the net by walking slowly with hands in front for protection. If geese are on the water and need to be herded toward a net on shore, canoes, kayaks, and rowboats can be used if it's too deep for wading. Once the geese are contained in the

net, the opening is quickly closed. Geese can then be handled and tagged, if desired. A truck can then be backed up to the opening, and the geese are herded into the truck for removal.

Cannon nets are an efficient technique for capturing a flock of geese. An area is baited with waste grain, and a large net is folded flat and attached to projectiles. Once a suitable number of birds is within the target area, the cannons are triggered and the net is shot out over the geese. Wildlife personnel then hand capture the birds from under the net. This technique requires large open areas free of trees and shrubs that can foul the net.

Relocation

Moving geese from urban environments can be successful. The reason that it sometimes fails is that Canada geese have very strong homing instincts and they tend to return to their previous nesting area. The other obvious shortcoming is that an area willing to receive the geese has to be established, and there are less and less of these areas within a reasonable distance from the suburban problem area. In a Minnesota study (Keefe, 1996), adult geese were trapped and moved to Oklahoma for several years. 10 to 20 percent of the adults returned to their original Minnesota capture site. Overall, relocation reduced the breeding population by 40-50 percent after one year and 70-90 percent after two years.

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An Ohio and Michigan study (Smith, et.al) found moving juvenile, flightless geese from urban areas to state operated wildlife management areas where hunting is done successfully removed geese from some problem areas. Juveniles do not have as highly developed a homing instinct as adults, and most stayed near the release point in the wildlife management area, adding to the sport harvest there.

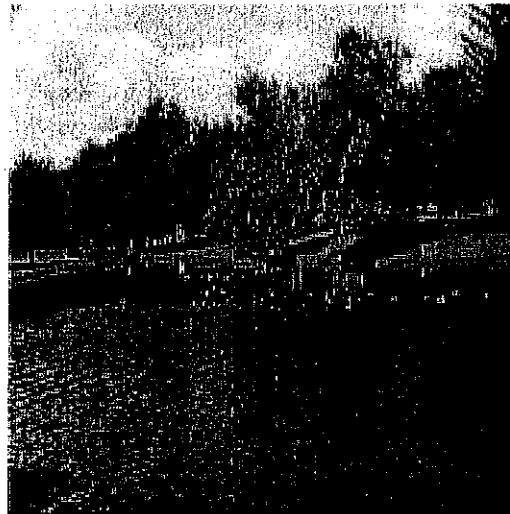
Harvesting of Geese

Almost without exception, harvesting (shooting) of problem geese will create a local controversy and be met with some animal welfare opposition that must be addressed in a considerate manner. Public education including evening meetings, website and printed material will be needed far more for this technique than for any other goose management measure. Time for the educational process to take place should be built into the goose management timetable.

Urban flocks of Canada geese can be difficult to hunt because of the obvious hazards to people and property. This along with the same regulatory guidelines designed to protect migratory waterfowl have limited the effectiveness of typical waterfowl seasons for controlling populations of suburban Canada geese. Where it is done, harvesting has enhanced other management options. Shooting increases noise disturbance, reduces protected areas

available to the birds for feeding or nesting, emphasizes habitat changes, and reduces adults, which is the most effective way to reduce the long-term population. Harvesting of adults can be augmented with egg removal or puncturing (this is termed 'addling'- see page 18).

The facts show that hunting is the most cost effective method for managing the suburban Canada goose population. The NJ Division of Fish, Game, and Wildlife sets Canada goose hunting seasons. Currently, there are two, one in September, the other in January and February.



Park pond with resident flock

Managed hunts are often the best way to reduce goose numbers in urbanized areas. Many states have opened early seasons, commencing September 1, in order to remove more resident geese. A more effective, site specific hunting approach is through issuance of special purpose kill permits where several trained individuals do the

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hunting at a particular, limited location, such as an airport.

Cooperation with local law enforcement will be necessary. Testing of interested hunters will need to be administered and an orientation for those hired must be provided.

This permitting method has also been used successfully at some golf courses and parks. To ensure public safety, these areas are then closed several hours on a set schedule for several weeks.

Shotguns are used for goose hunting. Shotguns propel a small mass of pellets over short distances, impacting the target area at ranges up to 40 yards. This means that shotguns have the *maximum* potential to hit the target with the *minimal* potential to impact a non-target animal or human.

Several states have used harvested geese in community food banks, homeless shelters and soup kitchens. Geese used for this may be either netted or hunted. This is a very positive approach that should always be investigated when a local harvesting/relocation measure is being considered. As of 1999, USDA approval was required for goose meat donation to food banks, so it was necessary to use USDA-inspected processing plants. Goose meat should be inspected for steel shot. Also, assurance should exist that the geese have not ingested pesticides, contaminating their meat. Although this is more unlikely in urban areas, there have been instances of goose poisonings

related to agricultural chemicals in farm locales.

Reproduction Control

Canada geese have a lifespan that can exceed 20 years if they survive their first year. Although reduction of the adult population is the most effective way to impact a pest flock, another method that can help is to reduce the reproduction rate. These methods should be considered where hunting or other means of reducing the number of adults are not feasible.

In order to have the same impact as eliminating one adult, ALL eggs produced by that adult must be removed for its entire lifetime, which is usually a far more labor intensive and costly method. Additionally, reduction efforts must be nearly 100% effective in a given area, since a small number of nests or eggs that are missed can offset the ones that are removed. Population models have shown mathematically that a resident Canada goose population could remain stable even if up to 72% of the eggs were removed. Even if 95% of the eggs were removed, it would take ten years just to reduce the population to a level 75% of the original (Barnard 1991).

Nest removal

The removal or destruction of a nest requires breeding geese to move, build a new nest immediately, or nest later in the season. This is a very labor-intensive approach, requiring daily visits to nesting sites.

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Also, since geese are very proficient at locating their nests in safe areas, they may be on islands or other difficult to access locations.

Egg Management

Eggs can be impacted in several ways that will terminate the viability of embryos. Just like with nest destruction, you must be able to find and get to the nest, making it a fairly labor intensive approach. All methods require that the eggs be carefully replaced in the nest to prevent the goose from being aware that the eggs have been tampered with. If this is not done, the geese will quickly lay more eggs. Typically, 4 to 7 eggs will be present in a complete nesting clutch.

The most common methods of impacting the eggs are: addling, puncturing, and oiling. For humane reasons, these methods should be done as early in the incubation process as possible, while being late enough to get all the eggs of that clutch.



Optimum habitat

Addling

Addling simply involves vigorously shaking the eggs found in the nest. The eggs must be shaken to the point that liquid is heard moving around inside.

Puncturing

Puncturing is accomplished by poking a strong, sharp pin through one end of the egg. This allows harmful bacteria to enter the egg.

Oiling

Oiling eggs works through the principle that oil prevents gases from diffusing through the shell, depriving oxygen from the embryo. The usual method is to either brush, spray, or dunk the eggs using 100 percent food grade corn oil.

Dummy eggs

Viable eggs can be removed from the nest and replaced with artificial or 'dummy' eggs made of wood or plastic. Also, unfertilized or hard-boiled 'real' eggs can be used. The goose will continue to incubate the eggs rather than re-nest.

In Toronto, Ontario, this method combined with hunting reduced the local Canada goose population by 40%. This method is less labor intensive than some of the previous because the nests are visited only one time.

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Conclusion

Problems with resident Canada geese will likely continue to increase in the coming years. The combined factors of low adult mortality and favorable habitat conditions for breeding and feeding indicate that resident goose flocks may double every five years. (Smith, et al 1999)

Management techniques exist that have proven to be successful. The challenge will lie in making the correct choices.

Solving conflicts between people and Canada geese will continue to create a significant management challenge for wildlife biologists and policy makers. A delicate balance must be achieved between the biological and social issues that revolve around the impacts of resident geese.



Sunrise.....or sunset?

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Who to Contact:

The *USDA Animal Plant and Health Inspection Service (APHIS) Wildlife Services* program is authorized and directed by law to assist landowners, corporations, agencies, and others in resolving damage situations involving federally managed wildlife. Wildlife Services is the agency primarily responsible for handling requests regarding Canada goose damage problems in New Jersey. This is accomplished through close cooperation with the U.S. Fish and Wildlife Service and N.J. Division of Fish, Game, and Wildlife. Assistance typically consists of providing information on control techniques, sources of bird control supplies, assistance with the permit process, and implementation of operational goose damage management activities through funded contracts.

U.S. Department of Agriculture - (APHIS) Wildlife Services
New Jersey office: Pittstown, N.J. (908) 735-5654

New Jersey Division of Fish Game and Wildlife: (609) 292-2965
For goose sport hunting information.

U.S. Department of the Interior - Fish and Wildlife Service (413) 253-8698
For actual issuance of permits to handle nests and eggs, shoot geese to reinforce harassment techniques, capture and/or euthanize geese.

References:

Note: Much of this Guide has been adapted for New Jersey from the Cornell Cooperative Extension Publication, *Managing Canada Geese in Urban Environments: A Technical Guide*. This publication is available from Cornell Cooperative Extension, Media and Technology Resource Center, Ithaca, NY. Phone 607-255-2080; fax 607-255-9946; e-mail Dist_Center@cce.cornell.edu

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Keefe, T. Feasibility Study on Processing Nuisance Canada Geese for Human Consumption. Minnesota DNR, Section of Wildlife. 1996.

Sellmer, J. Ornamental Horticulture Monthly Newsletter Vol. 1, No. 1 Penn State University, University Park, PA. 1998

Smith, A. E.; Craven, S. R.; Curtis, P. D. Managing Canada Geese in Urban Environments: A Technical Guide. Jack Berryman Institute Publication 16, and Cornell Cooperative Extension, Ithaca, NY. 1999.

USDA - APHIS Wildlife Services. Canada Goose Damage Management Resource Guide. Pittstown, NJ 2000.

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www.gpnc.org/canada.htm. Canada Goose

Appendix 1. Bird Control Devices: Sources of Supply

September 1999

USDA APHIS Wildlife Services

Consult Federal, State and local laws and regulations prior to purchase and use of these products. Listing of company and product names does not indicate or imply endorsement by the USDA, APHIS Wildlife Services Program or NRCS.

AUTOMATIC EXPLODERS

Bird Barrier

300 Calvert Ave.
Alexandria, VA 22301
1-800-6624737

Margo Supplies, Ltd.

Site 20, Box 11, RR #6
Calgary, Alberta, Canada T2M4L5
(403)285-9731

OESCO, Inc.

P.O. Box 540
Conway, MA 01341
(413)369-4335

Reed-Joseph International Co.

P.O. Box 894
Greenville, MS 38702-0894
1-800-647-5554

Sutton Agricultural Enterprises, Inc.

746 Vertin Ave.
Salinas, CA 93901
(831)422-9693

Wildlife Control Technology, Inc.

2501 N. Sunnyside Ave.
Fresno, CA 93727
1-800-235-0262

BALLOONS

Bird Barrier

300 Calvert Ave.
Alexandria, VA 22301
1-800-662-4737

Bird-X, Inc.

300 N. Elizabeth St.
Chicago, IL 60607
1-800-662-5021

Margo Supplies, Ltd.

Site 20, Box 11, RR #6
Calgary, Alberta, Canada, T2M4L5
(403)285-9731

Nixalite of America, Inc.

P.O. Box 727
East Moline, IL 61244
1-800-624-1189

OESCO, Inc.

P.O. Box 540
Conway, MA 01341
(413)369-4335

Reed-Joseph International

P.O. Box 894
Greenville, MS 38702-0894
1-800-647-5554

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Sutton Agricultural Enterprises, Inc.

746 Vertin Ave.
Salinas, CA 93901
(831)-4229693

The Tanglefoot Co.

714 Straight Ave., SW
Grand Rapids, MI 49504
(616)459-4139

Wildlife Control Technology, Inc.

2501 N. Sunnyside Ave.
Frenso, CA 93727
1-800-235-0262

CHEMICAL REPELLENTS

Avitrol:

Avirol Corp.
7644 E. 46th St.
Tulsa, OK 74145
1-800-633-5069

GOOSE REPELLENTS:

Bird-X, Inc.
300 N. Elizabeth St.
Chicago, IL 60607
1-800-662-5021

Lesco, Inc.

3521 Silverside Rd.
Wilmington, DE 19810
1-800-321-5325

Nixalite of America, Inc.

P.O. Box 727
East Moline, IL 61244
1-800-624-1189

RJ Advantage

501 Murray Rd.

Cincinnati, OH 45217-1014

1-800-423-2473

DISTRESS CALL/SOUND SYSTEMS

Bird Barrier

300 Clavert Ave.
Alexandria, VA 22301
1-800-662-4737

Bird-X, Inc.

300 N. Elizabeth St.
Chicago, IL 60607
1-800-662-5021

Johnny Stewart

P.O. Box 7594
Waco, TX 76714
1-800-537-0652

Margo Supplies, Ltd.

Suite 20, Box 11, RR #6
Calgary, Alberta, Canada, T2M4L5
(403)285-9731

OESCO, Inc.

P.O. Box 540
Conway, MA 01341
(413)369-4335

Reed-Joseph International Co.

P.O. Box 894
Greenville, MS 38702-0894
1-800-647-5554

Sutton Agricultural Enterprises, Inc.

746 Vertin Ave.
Salinas, CA 93901
(831)422-9693

Weitech, Inc.

P.O. Box 1659
Sisters, OR 97759
1-800-343-2659

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Wildlife Control Technology, Inc.
2501 N. Sunnyside Ave.
Fresno, CA 93727
1-800-235-0262

NETTING

Bird Barrier
300 Calvert Ave.
Alexandria, VA 22301
1-800-662-4737

Bird-X, Inc.
300 N. Elizabeth St.
Chicago, IL 60607
1-800-662-5021

J.T. Eaton and Co., Inc.
1393 E. Highland Rd.
Twinsburg, OH 44087
1-800-321-3421

Hot Foot America LP
298 Belvedere Ave.
Belvedere, CA 94920
1-800-332-1872

Internet, Inc.
7300 49th Ave. N.
Minneapolis, MN 55428
1-800-328-8456

J.A. Cissel Mfg. Co.
1995 Rutgers University Blvd.
Lakewood, NJ 08701
1-800-631-2234

Nixalite of America, Inc.
P.O. Box 727
East Moline, IL 61244
1-800-624-1189

OESCO, Inc.
P.O. Box 540
Conway, MA 01341
(413)369-4335

Sutton Agricultural Enterprises, Inc.
746 Vertin Ave.
Salinas, CA 93901
(831)422-9693

Wildlife Control Technology, Inc.
2501 N. Sunnyside Ave.
Fresno, CA 93727
1-800-235-0262

PORCUPINE WIRES

Bird Barrier
300 Calvert Ave.
Alexandria, VA 22301
1-800-662-4737

Bird-X, Inc.
300 N. Elizabeth St.
Chicago, IL 60607
1-800-662-5021

Cat Claw, Inc.
P.O. Box 5250
Johnston, PA 15904
1-800-832-2473

Hot-Foot America LP
298 Belvedere Ave.
Belvedere, CA 94920
1-800-332-1872

Nixalite of America, Inc.
P.O. Box 727
East Moline, IL 61244
1-800-624-1189

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PYROTECHNIC DEVICES

Bird Barrier

300 Calvert Ave.
Alexandria, VA 22301
1-800-662-4737

Margo Supplies, Ltd.

Sutie 20, Box 11, RR #6
Calgary, Alberta, Canada, T2M4L5
(403)285-9731

Reed-Joseph International Co.

P.O. Box 894
Greenville, MS 38702-0894
1-800-647-5554

Stoneco, Inc.

P.O. Box 765
Trinidad, CO 81082
(719)846-2853

Sutton Agricultural Enterprises, Inc.

746 Vertin Ave.
Salinas, CA 93901
(831)422-9693

Wildlife Control Technology, Inc.

2501 N. Sunnyside Ave.
Fresno, Ca 93727
1-800-235-0262

REFLECTIVE TAPE

Bird Barrier

300 Calvert Ave.
Alexandria, VA 22301
1-800-662-4737

Bird-X, Inc.

300 N. Elizabeth
Chicago, IL 60607
1-800-662-5021

Margo Supplies, Ltd

Sutie 20, Box 11, RR #6
Calgary, Alberta, Canada, T2M4L5
(403)285-9731

OESCO, Inc.

P.O. Box 540
Conway, MA 01341
(413)369-4335

Reed-Joseph International Co.

P.O. Box 894
Greenville, MS 38702-0984
1-800-662-4737

Sutton Agricultural Enterprises, Ltd

746 Vertin Ave.
Salinas, CA 93901
(831) 422-9693

The Tanglefoot Co.

314 Straight Ave., SW
Grand Rapids, MI
(616)459-4139

Wildlife Control Technology, Inc.

2501 N. Sunnyside Ave.
Fresno, CA 93727
1-800-235-0262

TRAPS

Bird Barrier

300 Calvert Ave.
Alexandria, VA 22301
1-800-662-4737

Margo Supplies, Ltd

Suite 20, Box 11, RR #6
Calgary, Alberta, Canada, T2M4L5
(403) 285-9731

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Minnesota Trapline Products

6699 156th Ave., NW
Pennock, MN 56279
(320) 599-4176

National Live Trap Corp.

Box 302
Tomahawk, WI 54487
(715) 453-2249

Reed-Joseph International Co.

P.O. Box 894
Greenville, MS 38702-0894
1-800-647-5554

Tomahawk Live Trap Co.

P.O. Box 323
Tomahawk, WI 54487
1-800-272-8727

Wildlife Control Technology, Inc.

2501 N. Sunnyside Ave.
Fresno, CA 93727
1-800-235-0262

TRAINED DOGS

Geese Management

PO Box 1504
Newton, PA 18940
(215) 968-0843

NJ Wild Geese Control

PO Box 7293
North Arlington, NJ 07031
njgeese@aol.com

Supplies Source:

Janet L. Bucknall State Director, Wildlife Biologist

United States Department of Agriculture
Animal and Plant Inspection Service
Wildlife Services

140-C Locust Grove Road
Pittstown, NJ 08867

Phone: (908)735-5654
Fax: (908)735-0821
Email: Janet.L.Bucknall@usda.gov