X. CONSERVATION ELEMENT

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1.0 INTRODUCTION

The conservation element is intended to provide guidance for the preservation, conservation and efficient utilization of natural resources within the Randolph Township. This element serves as an update to the 1992 Master Plan and is based largely on the Natural Resource Protection & Management Plan (2006).

The Natural Resource Protection Plan provides recommendations for responsible stewardship and management of the Town's resources for future generations through refining local land use and development practices. Existing and future threats to the community's natural resources are identified, as are planning practices and management techniques that may be implemented to achieve related community goals. Recommendations put forth in this conservation element are intended to complement and align with previous work designed to protect Randolph's natural resources.

The Randolph Township has a history of being a community where residents enjoy a high quality of life and where city dwellers seeking the solace of the countryside for their summer retreat. Thus, the Township's plentiful natural resources have contributed to a high quality of life for residents and visitors to the area. The Township is comprised of streams, valleys, wooded hillsides and other natural amenities that make the community desirable as a place to call home. These natural resources help to form Randolph's identity and provide important components of functioning ecosystems.

These ecosystems impact the everyday lives of residents in terms of water supply, drainage, flooding, building capacity, septic disposal, and farmland suitability. They also support the varied vegetative and wildlife communities which are linked to the multitude of streams, ponds, and lakes found throughout Randolph. The Township understands that all of the environmental components to be discussed below are linked and that every action taken to alter the environment impacts ecological functions as well as the integrity of our natural surroundings.

2.0 TOPOGRAPHY

The Randolph Township has varied topography and is located within the New Jersey Highlands. Also, it is a part of the Appalachian Mountains that has eroded over many years thereby forming the topography found in the Township. The Highlands rise between 400 and 600 feet above the adjacent lowlands that exist to the northwest and southwest. As a result, the Township's elevation, as shown in Figure X-1 *Topography*, ranges from 550 at the northeast corner of the Township by the Rockaway River to an altitude of 1,122 feet above mean sea level. This highest point within the Township is located approximately between Longview Avenue and Knollwood Terrace. The elevation varies throughout the remainder of the Township, which helps to form the hilly character of the area. This includes alternating flat-topped ridges and deep valleys.

3.0 BEDROCK

The Township of Randolph is underlain with bedrock that can be found at depths from zero to 7.2 feet below the surface. As shown in Figure X-2 *Depth to Bedrock*, the deepest bedrock sections, those that are between 6.7 and 7.2 feet deep, can be found throughout the Township and comprise about half of the Township's total acreage. Bedrock found at depths between zero and five feet also comprise a large portion of the Township. A lesser portion of the Township is comprised of bedrock that is between five and 6.2 feet below the surface. A small section of bedrock that is located between 6.2 and 6.7 feet below the surface can be found in the Township's north eastern corner, just south of South Salem Street. Based on a review of Figure X-2 *Depth to Bedrock*, bedrock is usually nearest to the surface in areas of high relief, steep slopes, and where resistance of the bedrock to glacial scour has occurred.

4.0 SOILS

Randolph Township is underlain by 18 soil classifications as shown in Figure X-3 *Soils*. Soil drainage in Randolph Township is classified from very poorly drained to excessively drained. A large percentage of Randolph is characterized by well drained soils. In areas near streams and drainage corridors poorly drained and very poorly drained soils exist, and steep slope areas are generally associated with excessively drained soils.

The characteristics of soils help to determine the suitability of land uses, especially in areas that do not contain pubic water and sewer infrastructure. Soils exhibiting constraints to development include hydric soils (where the soil has a shallow water depth), steep slope soils, and soils that do not perk properly for septic use. A description of each soil type found in the Randolph Township is described below:

Adrian — The Adrian series consists of nearly level, very poorly drained organic soils that are underlain by sandy deposits at a depth of 16 to 50 inches and are generally found in low positions. Permeability is rapid and available water capacity is high, with the water table at the surface most of the time. These soils are unstable under load, are compressible, and subside if they are drained.

Alluvial land — Alluvial land consists of water-laid sediment along streams in all parts of the county. The drainage of this soil is variable as well as its material. This soil type has a permanent high water table and is flooded annually. The hazard of flooding makes this soil type poorly suited to most uses.

Annandale — The Annandale series consists of deep, gently sloping to strongly sloping, well-drained soils that have a weakly developed fragipan in the lower part of the subsoil. A fragipan is a loamy, brittle subsurface horizon that is very low in organic matter and clay, but rich in silt or very fine sand. When dry, it is hard to very hard and seemingly cemented. Permeability is moderate above and below the fragipan and slow in the fragipan. The fragipan restricts the growth of plant roots. Depth to water table is generally more than 10 feet, but may be perched during brief periods late in winter and early spring.

Califon — The Califon series consists of deep, nearly level to strongly sloping, moderately well drained and somewhat poorly drained soils. These soils are mostly in waterways or seepage areas at the base of slopes in the granitic-gneiss uplands, but some are in the nearly level areas and depressions on the top of ridges. Permeability is moderate above and below a fragipan, but slow in the fragipan. The available water capacity is moderate. A high seasonal water table is the main limitation for community development.

Califon Variant — The Califon variant consists of deep, gently sloping, somewhat poorly drained soils. These soils are in waterways or swales on uplands and in many places at the base of steeper slopes. Permeability and available water capacity are moderate. During winter and early spring, the water table rises to within 0.5 to 4 feet of the surface. In warm seasons they remain ponded for several days after heavy rains.

Carlisle — The Carlisle series consists of deep, nearly level, very poorly drained organic soils. These soils are in depressions that were formerly or are now partly occupied by lakes or ponds. Permeability is rapid and available water capacity is high. The water table is at or above the surface most of the time. These soils are compressible and unstable under load and subside if they are drained.

Cokesbury — The Cokesbury series consists of deep, nearly level to gently sloping, poorly I drained soils and contain a moderately developed fragipan. These soils are generally cobbly and stony. Permeability is slow in the fragipan and available water capacity is moderate. Runoff is slow in depressions of nearly level areas. The water table is perched at or near the surface for long periods during winter and spring and after heavy rains. If these soils are used for crops or pasture, drainage improvement, stone removal, and control of erosion on gentle slopes is needed.

Edneyville — The Edneyville series consists of deep, gently sloping to steep, well-drained loamy soils. These soils generally contain granitic gneiss gravel, cobbles and stones. Permeability and available water capacity are moderate and the soil contains enough clay to give good compaction characteristics. Gently sloping to strongly sloping Edneyville soils are well suited to farming and community development. Steep Edneyville soils have limitations for both of these uses.

Netcong — The Netcong series consists of deep, gently sloping to strongly sloping, well-drained soils. Some stones and boulders are scattered on the surface and within the soil. Permeability is moderately rapid to a depth of about 50 inches and rapid below. The available water capacity is moderate.

Parker — The Parker series consists of deep, gently sloping to very steep, excessively drained soils that contain a large amount of granitic stones, cobbles, and gravel. Permeability is moderately rapid and available water capacity is low.

Pits, sand and gravel — Pits, sand, and gravel consists of open excavations and adjoining areas of fill material removed during the mining of sand, gravel, and borrow material. This land type includes both active and abandoned pits.

Pompton — The Pompton series consists of deep, nearly level to gently sloping, somewhat poorly drained soils. Permeability is moderately rapid, and available water capacity is moderate. These soils have a seasonal water table at a depth of 0.5 foot to 1.5 feet in winter and in spring. Generally, they are not subject to flooding, but soils in level areas or depressions are ponded for several days after heavy rains or fast thaws. Spot drainage and erosion control measures are needed if these soils are to be used for community development. The soils are strongly acid and need to be limed prior to planting crops.

Preakness — The Preakness series consists of deep, nearly level, poorly drained soils. These soils are mostly granitic material, but they contain a small quantity of other kinds of minerals such as quartzite, sandstone, and shale. Permeability is moderately rapid and available water capacity is moderate. The water table is at or near the surface late in the fall, in winter. In many places these soils are ponded in the winter, and they are subject to annual floods in spring and low-frequency floods in the summer. They are frequently too wet to support heavy equipment needed to place fill material. Outlets for drainage are difficult to locate because of the low position, high water table and low relief of soils.

Preakness Variant — The Preakness variant consists of deep, nearly level, very poorly drained, moderately coarse textured soils. Permeability is moderately rapid. The soils have a water table at or near the surface most of the year. During summer and in periods of long droughts, the water table drops to a depth of 2 — 3 feet, but it quickly rises in periods of heavy rains. Undrained areas are too wet for farming or community development.

Ridgebury — The Ridgebury series consists of deep, nearly level to gently sloping, poorly drained very stony or extremely stony soils. Permeability is moderate above the fragipan and slow in the fragipan. The soils have good stability and compaction characteristics. They are only slightly compressible and have low subsidence. The water table is at or near the surface during most of the winter and in spring. In low nearly level areas they are subject to seasonal ponding and frequently remain ponded for long periods. Water capacity is moderate, but water stored below the fragipan is not available for plant use. Because of their low position, where they receive runoff from surrounding higher areas, and because of their high water table, the soils are natural sites for ponds and reservoirs.

Riverhead — The Riverhead series consists of well-drained, nearly level to strongly sloping gravelly soils. Permeability is moderately rapid, and available water capacity is moderate. Depth to the water table is more than 10 feet. These soils are slightly compressible and compact well under a variety of moisture conditions. They are underlain by loose, unweathered stratified and sorted sand and gravel, which is rapidly permeable. These soils are used for urban development, but are also suited for growing crops and trees.

Turbotville — Turbotville series consists of deep, nearly level to gently sloping, somewhat poorly drained soils in waterways, in depressions on broad nearly level areas. These soils have a moderately developed fragipan. Permeability is moderate above the fragipan and slow in the fragipan. The available water capacity is moderate. In their natural condition these soils are wet during winter and early spring. Depth to the seasonal water table is about 0.5 foot to 1.5 feet. Water may pond on these

soils for several days. Wetness restricts the choice of crops and the timing of farming practices on these soils. A seasonal high water table and lateral seepage of water on top of the fragipan are the main limitations for community development.

Urban Land — Urban land consists mostly of areas that are either paved or built upon. The soils in the remaining open spaces have been reworked to the extent that the original profile cannot be recognized. The characteristics of the material are variable. Areas of Urban land are in community development and not suited for other purposes.

5.0 STEEP SLOPES

According to the Randolph Township Land Development Ordinance (LDO), steep slopes, i.e. soils with slopes greater than 15%, contain severe limitations to development such as (but not limited to) building and road construction and septic tank effluent disposal. Figure X-4 *Excessive Slopes*, show areas within the Township that have slopes greater than 15%. These steep slopes are found along hillsides in the eastern part of the Township as well as in the western part of the Township where a northern/southern-oriented steep slope ridge exists west of Park Avenue. More than 2,100 acres (16 percent) of the Randolph Township contain hillsides with slopes that are greater than 15 percent.

The Land Development Ordinance regulates land use on slopes that are greater than 15%. Maximum disturbance allowed on steep slopes are established in the following table taken from the 1994 LDO:

Table X-1

Township of Randolph

Percent Allowable Disturbance Per Slope

10-14.99%	40%
15-19.99%	15%
20-24.99%	10%
25%+	0%

Source: Randolph Township Land Development Ordinance, 1994

Slopes between 10-14.99% are regulated if they are located within 100 feet of a wetland transition area or within 100 feet of freshwater as defined by the "Surface Water Quality Standards, NJAC 7:9-4.1 et seq." and/or if they are within 100 feet of a "*critical area*." The LDO defines critical areas as an area with one or more of the following: steep slopes, floodplains, soils classified as having high water tables, soils classified as highly erodible, subject to erosion , or highly acidic, land incapable of meeting percolation requirements, land formerly used for landfill operations or hazardous industrial use, fault areas, stream corridors, estuaries, mature stands of native vegetation, aquifer recharge and discharge areas, wetland transition areas, and habitats of endangered species.

Property located in the Highlands Preservation area will have steep slopes regulated under the Highlands Water Protection and Planning Act.

6.0 AQUIFERS AND RECHARGE AREAS

The Township of Randolph derives its drinking water supply from groundwater resources. Most of the ground water resources are from a consolidated (bedrock) aquifer and, to a lesser degree, from a stratified sand and gravel aquifer. Aquifers are recharged by infiltration, which is the percolation of groundwater through the soil and unconsolidated material to the aquifer. The Township needs to be aware that infiltration in consolidated (bedrock) formations where water travels through cracks in the bedrock are at a higher risk for groundwater contamination if contaminates enter the aquifer. This is because there is less material for the groundwater to filter through prior to reaching the aquifer.

6.1 Sole Source Aquifers

A sole-source aquifer is one in which more than 50% of the drinking water is supplied to a specific region or area. It is important to note that sole source aquifers cannot be replaced if they become contaminated. As a result, any project in an area that could pose an adverse affect to groundwater resources in a sole-source aquifer recharge area must be reviewed by the USEPA if it receives federal funding. The Township of Randolph is situated above three sole source aquifers, which include the 1) Buried Valley, 2) Rockaway, and 3) Northwest New Jersey sole source aquifers.

The Buried Valley recharge zone is defined by the outer boundaries of Bernards Township, Warren Township, Berkeley Heights, New Providence, Summit, Millburn, Livingston Township, Roseland, Essex Falls, Caldwell, West Caldwell, North Caldwell, Fairfield, Montville, Parsippany-Troy Hills, Morris Township, and Harding Township. The stream-flow source zone is defined by those parts of the Passaic, Rockaway, and Whippany River watersheds that drain to the recharge zone. USEPA's project review area is both the recharge zone and the stream-flow/source zone.

The Rockaway sole-source aquifer, formally known as the "Unconsolidated Quaternary aquifer in the Rockaway River Area, New Jersey" has a recharge zone defined by the outside boundaries of the Rockaway River watershed, the Black (Upper Lamington) River watershed in Roxbury Township and Lake Arrowhead watershed in Denville and Mountain Lakes. Its stream-flow source zone is the same as the recharge zone, thus the USEPA's project review area is also the recharge zone.

Northwest New Jersey sole-source aquifer, formally known as the "Fifteen Basin Aquifer Systems of New Jersey" has a recharge zone defined by the outside boundaries of the Delawanna Creek watershed, the Flatbrook watershed, the Lopatcong Creek watershed, the Muskonetcong River watershed, the North Branch Raritan River watershed, the Papakating Creek watershed, the Paulinskill watershed, the Pequest River watershed, the Pochuck Creek watershed, the Pohatcong Creek watershed, the South Branch Raritan River watershed, the Shimmers Brook watershed, the Van Campens Brook watershed, and the Wallkill River watershed. This sole source aquifer also includes the part of the Millstone River watershed that lies outside the Coastal Plain. Its stream-flow source zone is the same as the recharge zone, thus USEPA's project review area is also the recharge zone.

Projects regulated under the NJDEP Stormwater Management Rules will be required to maintain 100% of the average annual pre-construction groundwater recharge volume for the site.

7.0 SEASONAL HIGH WATER TABLE

The seasonal high water tables within the Township exist along stream corridors, channels, and around water bodies in lower-lying areas. Figure X-5 *Seasonal High Water Table* shows areas that contain shallow and deep water tables. The area exhibiting the shallowest water table (0.01-1.5 feet) corresponds with an unnamed Whippany River tributary. The 0.5-1.5 foot range and the 1.5-2.5 foot range are associated with other existing tributaries. The areas with the deepest water tables are located in areas that contain the deepest bedrock. These involve a water table depth between 2.5 and 6-feet deep.

8.0 SURFACE WATER QUALITY CLASSIFICATION

The New Jersey Surface Water Quality standards (NJAC 7:98. et seq.) have been established for the protection and enhancement of surface water resources. Below is a listing of various classifications taken directly from the Inventory Update that apply to surface waters found in Randolph Township along with their definitions. Trout production, FW1 and Category 1 waters are the highest quality waters and merit the greatest protection from pollution and encroachment.

TP – Trout Production waters can support natural reproduction by trout and year-round survival.

TM – Trout Maintenance waters can support trout year-round. but cannot support natural reproduction. These waters are typically stocked with hatchery-reared trout for recreational purposes

NT – Nontrout Waters are not associated with trout production or trout maintenance, because trout would not survive past the hot summer months. However, trout may be stocked to provide seasonal recreation for anglers in spring or fall. NT waters usually support a self-sustaining warmwater fishery such as bass, sunfish. perch. catfish. pickerel, suckers, and carp. In addition. some large NT lakes also receive occasional plantings of walleye, tiger musky, hybrid stripers, and channel catfish.

FW1 – Exceptional freshwaters, as designated in NJAC 7:98-1.15(h), that are set aside for posterity because of their unique aesthetic value, exceptional water supply significance, exceptional recreational significance, ecological significance, and/or exceptional fisheries resource (may include trout production waters). These waters are not to be subjected to manmade wastewater discharges or increases in run-off from anthropogenic sources.

FW2-TM – Fresh waters not meeting the categories of FW1 or Pineland Waters, but considered acceptable for trout stocking and over (although trout reproduction has not been documented).

FW2-TM (C 1) – Trout maintenance “category one waters” which do not have trout production (TP) or FWI status, but may be upstream from trout production waters or originate wholly within federal, interstate, State, county, or municipal parks, forests, fish and wildlife lands and other special holdings.

FW2-TM(C2) Trout maintenance “category two waters” which are not designated as Outstanding National Resource Waters or “category one waters” for the purposes of implementing the anti-degradation policies set forth in NJAC 7:9B-l .5(d).

FW2-NT - Fresh waters not meeting the categories of FWI or Pineland Waters with nontrout status (no trout reproduction or maintenance), although most likely supporting a warm-water fishery.

"Highlands Open Waters" means all springs, streams including intermittent streams, wetlands, and bodies of surface waters, whether natural or artificial, located wholly or partially within the boundaries of the Highlands Region, but shall not mean swimming pools.

Surface water resources receive protection under the NJDEP Land Use regulation Program (LURP) as follows:

- Implementation of Best Management practices (including the mandatory Low Impact Development Strategies (LIDS)) under the NJDEP Stormwater Management Rules which currently apply to Residential projects, but which will apply to all "major development" projects (as defined by NJDEP) once they are adopted by each municipality as part of the NJPDES Municipal Stormwater Permit program (due April 2006)

- Implementation of current Wetlands Permitting requirements under the NJDEP Freshwater Wetlands Protection Act that exceed the minimum requirements of the USACOE 404 program including:

  Wetlands "Transition areas":
  50 ft minimum for Trout Maintenance Waters (TM)
  150 ft minimum for Trout Production Waters (TP)

- Stream corridor protection buffers (no removal of vegetation) within 25 ft (for NT) or 50 ft (for TM and TP) from top of bank under the NJDEP Stream Encroachment regulations.

- Certain projects adjacent to C-1 and Highland Open Waters are also subject to a 300 ft "Special Water Resource Protection Area" buffer.

9.0 DRAINAGE BASINS AND MAJOR SURFACE WATER FEATURES

Three major drainage basins are situated within the Randolph Township and are depicted in Figure X-6 *Water Resources*. They include the Rockaway River, the Whippany River, and the Raritan River drainage basins. The tributaries within the Township that drain into the Rockaway River basin include Jackson Brook, Wallace Brook, Mill Brook, and Den Brook. The Rockaway River drains more than half (51%) of the Township. Several unnamed tributaries drain about 12% of the Township's surface water toward the southeastern boarder of the Township and into the Whippany River. The remaining 37% of the Township's surface water flows into the Raritan River drainage basin, which includes the Black River, Burnett Brook, Dawson's Brook, and India Brook. Protection should be afforded where stream and other surface water corridors exist to prevent soil erosion, improve/maintain water quality, provide shelter, food and water resources for wildlife, abate floods, and protect property values.

10.0 FLOODPLAINS

The Randolph Township recognizes that floodplains are a "*critical area*" that require additional attention and regulation in the LDO. The State of New Jersey Department of Environmental Protection (NJDEP) also regulates floodplains under the Flood Hazard Area Control Act. The floodplain, as opposed to the floodway, is calculated by the area inundated by the 100 year storm,

plus 25% flow in order to anticipate future development affects in the watershed. The floodway and the flood fringe are included in the flood hazard area. The floodway is the channel and portions of the floodplain adjoining the channel which are reasonably required to carry and discharge the regulatory flood. Simply put, the flood fringe is the portion of the floodplain contiguous to the floodway, which experiences flooding to a lesser extent than the floodway. The Lamington and Rockaway Rivers are delineated by the State as floodway and flood hazard areas and can be viewed in Figure X-6 *Water Resources*. NJDEP prohibits construction within 25 feet or 50 feet from the top of the bank. Projects regulated under the Flood Hazard Area Control Act are also subject to stormwater and water quality management rules under the NJDEP Land Use Regulation Program. Special Water Resource Protection Area buffers of 300 feet from top of the bank would also apply. Projects within the Highlands Preservation Area are also subject to more restrictive permit requirements under the Highlands Water Protection and Planning Act.

11.0 WETLANDS

The locations of many wetlands within the Randolph Township coincide with stream corridors, drainageways and other low lying areas that consist of poorly drained soils. In total, approximately 7 percent of the Township's land mass contains wetlands. As shown in Figure X-6 *Water Resources*, most of wetlands within the Township are located in the northwest and are associated with the Black River. The next largest wetland area is located in the northeastern portion of the Township and is associated with the Rockaway River and Mill Brook. Soils exhibiting a seasonal high water table with poorly drained soils coincide with the location of wetlands. Wetlands are classified into Wetland Resource Value Classifications, which include 1) Exceptional Resource Value Wetlands, 2) Ordinary Resource Value Wetlands, and 3) Intermediate Resource Value Wetlands. It is important to note that the NJDEP has the final authority to determine the resource classification of wetlands, which depends on the surface water classification of the associated waterway, presence of threatened or endangered species habitat, and other physical characteristics. Wetland transition area buffers are required around intermediate (50') and exceptional (150') wetlands.

Priority wetlands are designated by the U.S. Environmental Protection Agency (EPA). Two priority wetland areas have been designated by the EPA within the Randolph Township; The Passaic River Basin, and the Lamington River (Black River) Watershed. A majority of the Township is situated within the Passaic River Basin. It is also important to note that isolated wetlands that are not located in floodplains with the Passaic River Basin are not EPA priority; however, they may be considered "Vernal Ponds" and therefore, subject to NJDEP scrutiny. In the Highlands Preservation Area, wetlands are subject to 300' buffers and NJDEP regulations.

12.0 CRITICAL HABITATS

The State of New Jersey and the national government list endangered species whose prospects for survival are in immediate danger because of loss or change in habitat, over-exploitation, predation, competition, disease, disturbance, or contamination. As such, assistance and preservation efforts are required to prevent future extinction. Threatened species are those which may become endangered if conditions around them begin/continue to deteriorate.

The Natural Resource Protection & Management Plan identifies several federal and state listed threatened and endangered species as well as priority species. These species depend on specific habitat to sustain their populations. The Landscape Project, an ecosystem level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey, produced habitat data used in the Natural Resource Protection & Management Plan. A discussion of endangered, threatened and priority species, their habitats, and the location of these habitats within the township are described and illustrated in the Natural Resources Protection & Management Plan. In general the majority of habitat suitable for state and federal threatened and endangered species exists in the southern and western portions of the town.

13.0 RECOMMENDATIONS

The following recommendations can be utilized to preserve the rural character of Randolph, preserve open space and protect critical environmental areas, including, but are not limited to: wetlands, floodplains, steep slopes, mature woodlands, groundwater, sensitive surface waters and wildlife habitat. These recommendations are consistent with the natural resource protection and management strategies set forth in the Natural Resource Protection and Management Plan.

The purpose of the conservation element is to identify the means for Randolph to preserve the ecological, historic, visual, and scenic resources of the Township: a) by providing a continuous network of open space along streams, slopes, scenic areas and critical environmental areas; b) by limiting or prohibiting development in critical environmental areas; c) by limiting environmental degradation and adverse impacts such as noise and air pollution due to improper use of land; d) by encouraging land development which preserves natural amenities and does not aggravate drainage problems affecting the Township and water quality, particularly in important wellfield and drainage areas and; e) by prohibiting stream channel relocation and development and by providing for suitable wildlife habitat. Listed below are specific recommendations to further this purpose.

1. Steep Slope and Woodland Protection - The municipality should continue to restrict development intensity and coverage on steep slopes and prevent the cutting of trees on steep slopes. Overdevelopment and subsequent loss of the forests will produce rapid stormwater runoff and severe erosion along with habitat loss and aesthetic blight. The preservation of the vegetation holding the thin soil cover on the steep slopes is also vital to the water quality in the Township's streams and lakes and helps to insure the quality of water entering the Clyde Potts Reservoir.

The steep slope regulations should be expanded to regulate development along ridgelines. This will provide aesthetic benefits in protecting scenic vistas and will help to minimize the erosion potential along the top of steep areas. This provision will require a definition of ridgeline as well as provisions for permitted and prohibited activities within specified distances of a ridgeline.

2. Wooded lots – Continue to encourage residential development which maintains "wooded lots." Continue to preserve large areas of mature woodland.

3. Tree cutting along collector and higher order roadways should be limited so as to preserve the wooded view from the roadway except in those situations where traffic safety requires vegetation removal. It is recommended that along existing or proposed roadways, removal of trees of over five inches in diameter at breast height be minimized. Removal of existing trees can usually be lessened by shifting the site of the building, parking lot, or access drive. Planting of trees along side of roads is encouraged to reinforce the Township's rural character. It is recommended that trees continue to be required for all new development a minimum of (30 feet on center.) These roadside trees should be deciduous hardwoods and should meet the following criteria: cast moderate to dense shade in the summer; be long lived, be tolerant of pollution and heat, require little maintenance, be able to survive 2 years with no irrigation after establishment; and be of native origin, provided they meet all other criteria. Additional hedging and tree planting along roadways should also be strongly encouraged.

4. Conservation Easements – As per the Subdivision Regulations in the Land Development Ordinance, the Township should continue to obtain conservation easements along stream corridors. Require a conservation easement of at least 75 feet on both sides of a basic stream corridor and 300 feet along both sides of a high quality stream, i.e. a trout production, trout maintenance stream as delineated by the NJDEP. The Township may want to adopt buffer requirements that specify permitted activities within such areas and provide for restoration or rehabilitation following entry for permitted uses.

5. Review the Township's current Stormwater Management Plan prepared by Suburban Engineers in March, 2005 for consistency with the Land Development Ordinance and New Jersey Department of Environmental Protection's Stormwater Regulations.

6. Continue to accept dedication of conservation easements in the Den Brook and Jackson Brook watershed areas and/or promote dedication to the Morris County Park Commission.

7. Track and map easements system as part of the Open Space Program to be administered by the Engineering Department. Catalogue and map all conservation easements, open space easements and/or land dedicated to the Township for open space/parkland or greenway use. Conservation easements/buffer areas to protect stream corridors such as the Black River and India Brook should be required as a condition of all developments impacting adjacent to stream corridors.

8. Review zoned densities – Densities have been lowered in the Township in the past where the presence of environmental constraints makes current densities inappropriate, especially in drainage basin areas of potable and other sensitive water supplies. Continue and expand the low density development policy.

9. Open Space/Cluster Development should be permitted and encouraged where there is a current low density and/or environmentally sensitive character. In no case should lot sizes in clusters be reduced below one acre unless public sewer service is available and clustering considered appropriate for the site by the Township. A residential lot averaging ordinance should also be considered, under which developers are permitted to adjust individual lot sizes without increasing the overall density of development in order to preserve environmentally

sensitive areas. This option should be available in zone districts greater than one acre and only for major subdivisions creating more than a specified number of lots.

10. Establish Open Space Networks/Greenways –Explore the possibility of requiring that conservation areas and the linkages between them are identified on site plans and subdivision submissions whereby the municipality may arrange for acquisition of the reserved area or negotiate for a conservation easement. Explore the possibility of developing a greenway overlay district with additional performance regulations for protection of natural features.

Continue to promote the establishment of greenway/open space linkages via stream corridors, flood hazard areas, wetlands, steep slope areas, wildlife corridors, existing public and private conservation easements and public uses including local and county parkland. Historic landmarks and districts, railroad and utility rights-of-way, farmlands, mature woodlands and trails may also be used. Morris County's Patriot's Path is a good example of a regional greenway system.

11. Development Standards and Conservation – Continue to avoid improvement standards which require excessive pavement, road widths, or parking lot sizes which unnecessarily increase ground cover. This would include an examination of permitted FAR and impervious coverage in all nonresidential zones.

The Stormwater Management Plan recommends a review and possible adaptation of ordinances prohibiting the construction of sidewalks and driveways made of pervious surfaces. It also recommends that islands should be allowed for use in stormwater management by disconnecting impervious surfaces and treating runoff from impervious surfaces. Right of way and cartway widths should be reviewed to ensure they are the minimum necessary for traffic density and emergency vehicle movement. The general parking space size should be reduced from 9 x 20' to 9 x 18', with exceptions for retail parking lots especially where shopping carts and the transfer of packages is a concern.

12. Continue to require natural resource mapping for all subdivisions, site plan approvals. Mapping should delineate all natural resources, environmentally critical areas and historic resources as defined in the Master Plan or as otherwise required.

13. Conservation and historic/scenic assets – Continue to consider the location of historic or culturally significant buildings and areas, the location of scenic views and preservation of conservation areas in the arrangement of new development. Where possible, development should avoid the destruction of historic or cultural sites or areas and scenic areas. This can be accomplished by avoiding these areas or including them within the context of new development as focal points and guides for the design of new buildings. The design of subdivisions and buildings should preserve scenic views, retaining them as a natural amenity.

14. The Black River Wildlife Management Area is an exceptionally valuable natural and recreational resource for both Randolph and the surrounding area. Land uses along the Black River and western portion of the Township should be periodically reexamined for potential impact to this area in terms of environmental impact. Land uses with the potential of

producing significant pollution should be limited or restricted in this area. Residential densities should be maintained at low densities to protect sensitive environmental conditions.

15. Wetland Protection - Establish a buffer area for wetlands classified as "ordinary value" by the DEP, i.e. certain isolated wetlands man-made drainage ditches, swales or detention basins. A planted buffer area of 15 feet is recommended to provide additional erosion control, prevent sedimentation of waterways and urban wildlife corridors. It should be noted that certain conditions may exist where the suggested buffer area would not be appropriate such as along a drainage swale adjacent to a roadway. A buffer in this area would be appropriate opposite the road only where it does not interfere with necessary site distance.

16. Groundwater Supply - Considering the importance of groundwater supply and quality to Randolph Township and surrounding municipalities, potential impacts should continue to be considered when reviewing significant development proposals within Randolph. Since aquifers do not stop at municipal boundaries, impacts to ground water supply and quality in neighboring municipalities may influence the quality and quantity of water supplies available within Randolph and visa versa. Local land use policy should seek to evaluate development not only as it impacts ground water and other natural resources in Randolph, but also as it relates to adjacent municipalities. The Engineering Department should keep aware of development in neighboring municipalities and the potential impact it may have.

Increased groundwater protection strategies should be considered in environmentally sensitive areas such as in the vicinity of the Alamatong wellfield and Combs Hollow. Environmentally sensitive "Best Management Practices" to control pollutants from stormwater runoff, control of other non-point source pollutants, restriction on the use of hazardous chemicals and the possible purchase of certain wellhead or drainage protection areas may be employed. The Natural Resources Protection Plan recommends the creation of a new zone with restricted uses similar to the I-2 zone provisions. These standards should be considered for locations where the quality of groundwater and surface water is crucial.

17. Farmland Preservation - Although farming continues to decline in the community, many farms remain, often adjacent to or within otherwise suburbanizing neighborhoods. Farming continues to provide a source of local produce and contributes to the open space and general rural character in several areas of the Township. Where practical, the preservation of farming should be encouraged.