

**Section IX**

**CONSERVATION PLAN ELEMENT**

## SECTION IX - CONSERVATION PLAN ELEMENT

### INTRODUCTION

The purpose of the Conservation Element is to promote the preservation, conservation, restoration, cultivation and appropriate utilization of natural and historic resources as a benefit to the community. The conservation of natural resources maintains and improves the public health, safety and welfare. Cultivation of landscape within the community expands the diversity of habitat and promotes a desirable community aesthetic. Numerous positive impacts will result from prudent conservation and cultivation of natural resources, including flood control, water quality improvements, oxygen replenishment or pollution dilution, soil erosion control, micro-climactic benefits, windbreak, and increased opportunity for recreation. Inappropriate land development can result in adverse impacts upon these aspects of life. Therefore, conservation and cultivation of natural resources is an important basic factor of the many elements that contribute toward the creation of a desirable and prosperous quality of life and character of the community.

Similarly the preservation and restoration of historic resources, including farmland preservation, offers significant benefit to the community. Historic resources provide a knowledge base to understand the land and society we all live within. This knowledge can assist present and future decision processes concerning community growth and provide a sense of community pride or heritage. Historic and farmland resources provide a baseline for the community's character and present opportunities for recreation and education. Farm preservation can establish a desirable pastoral aesthetic for the community and preserve a historic way of life that is characteristic of the community.

The following document contains information regarding the current status of various Township natural resources and conservation related issues. This information is based on the work of the Township Environmental Commission in its creation of an updated Township "Environmental Resource Inventory" or ERI for the year 2000. The ERI is incorporated in this Conservation Element and is also available as a separate document.<sup>1</sup> The reader should note that the Conservation Element incorporates, but does not take the place of, the ERI. The Township ERI is subject to regular update and should be consulted for the most current description of natural/environmental conditions in the Township.

Due to the broad nature of conservation issues in general, this document also includes information relevant to farmland protection and open space preservation, which are also addressed in other elements of the Master Plan. For these topics, the Conservation Plan should be reviewed in conjunction with the Master Plan Elements that specifically target these issues.

### GOAL/POLICY STATEMENT

The following major goals and policies are established for this Element. Due to the nature of this Element, many goals and policies are equally applicable to the Parks, Recreation and Open Space Element.

*A. Goal: The overall goal of the Conservation Element is to preserve and maintain the ecological, historic, visual, agricultural and scenic resources of the Township, preserve the environment and, avoid or minimize detrimental impacts of land development upon natural and*

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<sup>1</sup> This ERI was developed, in part, using publicly available New Jersey Department of Environmental Protection (NJDEP) Geographic Information System (GIS) digital data, but this secondary product has not been verified by NJDEP and is not state-authorized. Also, there may be omissions in the information obtained from NJDEP because certain facilities/projects located in West Windsor Township may have an address that is not listed as "West Windsor". With the consolidation of the West Windsor Post Office, these facility/project addresses will be corrected. A goal of the West Windsor Environmental Commission is to update addresses with the NJDEP. Further bibliographic information is included in the West Windsor Township ERI document.

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*historic resources and enhance the overall quality of life for Township residents.*

### **Policies**

1. Identify and protect ecological, historic, visual, agricultural and scenic resources through the use of creative land development techniques (i.e. clustering, lot averaging, transfer of development rights, flexible implementation of setbacks and buffers) other methods as may be found effective and practical. This should be done throughout the Township, and in particular, along the sensitive Millstone River and Old Trenton Road corridors.
2. Continue to use the local open space tax to preserve environmentally sensitive areas, agricultural lands, parkland, greenbelt, historic resources and other conservation areas. In addition, pursue other State and County funding mechanisms and methods of acquisition and/or preservation as available and practical (i.e., conservation easements, private donations).
3. Encourage the continued protection of the continuous township-wide "greenbelt," both existing and proposed areas. The greenbelt shall incorporate natural areas, stream corridors, environmentally sensitive areas and areas of scenic beauty, in order to connect various parts of the Township through a unique open space network and to maintain and enhance the natural character of the community and quality of life for West Windsor residents. The Township should continue to support and increase awareness of the Greenbelt and Greenbelt Plan and its importance to the community.
4. Where possible, incorporate the Township Greenbelt Plan with State, County and adjacent Community Greenbelt networks.
5. Where possible, link small or isolated environmentally sensitive or open space areas with those on adjoining tracts and, where practical, through to the established or proposed greenbelt network.
6. Proactively protect, maintain and expand the community forest, including street trees, park landscape and natural areas, wherever they occur.
7. To the extent possible, encourage existing agricultural areas to remain. Where possible employ agricultural districting, land and/ or development rights acquisition, and other methods where practical to preserve agriculture, particularly in the southern portion of the Township where active agriculture is most viable. Employ specific farmland preservation planning to achieve this goal.
8. Active participation in farmland preservation programs should be fostered to retain existing farmland and create viable farm enclaves.
9. Maintain design and siting standards to protect the Township's historic and rural character throughout the Township, and particularly in the Township's original villages and centers and along those roadways where natural vegetation, farmland or open space remain. These historic features and rural/ farmland areas should be preserved wherever possible. They establish the pastoral open character of much of the Township and represent the community's heritage.
10. Encourage conservation of individual archaeological and historical landmarks wherever they occur, and also including clusters of locally significant historic sites and areas predominantly found in the crossroad villages of Edinburg, Dutch Neck, Port Mercer and Penns Neck. Recommend preparation of a separate Historic Preservation Plan Element.

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11. Continue to work with State and County organizations to promote environmental protection, open space and farmland preservation. In addition, the Township should foster a working relationship with private and non-profit conservation groups (F.O.W.O.S., Stonybrook watershed group, etc.) to consolidate and coordinate conservation efforts.

12. Preserve and improve the quality of both surface water bodies and groundwater resources.

### SUMMARY OF LOCAL CONSERVATION ACTIVITIES:

West Windsor Township has enjoyed very progressive and fruitful actions in the arena of environmental conservation over the past twenty five to thirty years. The Township Environmental Commission, Planning and Zoning Boards, Shade Tree Committee, Administration, Staff and Governing Body have all contributed to these efforts. The Township Environmental Resources Inventory and Community Forestry Plan provide detailed data and information describing existing conditions and environmental programs currently in place or under development by the Township. Significant programs include:

1. **Greenbelt.** Establishment of the Township Greenbelt Plan in 1977. The Greenbelt establishes linear belts of conservation lands along stream corridors to maintain and preserve wildlife habitat, wetlands, floodplains and native vegetation. This plan was developed by the Environmental Commission, and they have updated the plan several times since adoption. The latest amendment was in 1999.
2. **Environmental Resources Inventory.** The Environmental Commission compiled and adopted a Natural Resource Inventory in 1979. This document was the first comprehensive inventory of environmental aspects of the community. It was revised in 1991 and has been revised again by the Environmental Commission for inclusion to this Master Plan.
3. **Water Quality Monitoring.** West Windsor Township had, for a period of time, a sampling program to monitor surface water quality in the Township. This information was used to monitor surface water quality and to identify any trends or significant changes. The sampling program included pollutants such as total coliform, fecal coliform, biochemical oxygen demand, chemical oxygen demand, total suspended solids, pH, and total phosphorus. The Environmental Commission administered this program and recently decided to discontinue this program, as it became redundant relative to USGS, NJDEP and local watershed association programs.
4. **Community Forestry Plan.** The Township reformed the Shade Tree Committee in 1999. This committee has been placed in charge of analysis, monitoring and care of the community forest. This includes street trees, as well as trees and woodland on public lands. The Shade Tree Committee and Township staff developed a Community Forestry Plan in 1999 which received approval by the State Department of Forestry for inclusion in State programs. This document provides a detailed description of Township goals, policies and actions planned to maintain and expand the community forest of the Township. This document is to be considered as a sub-element of the Conservation Plan Element and is included herein as Appendix A.

### EXISTING CONDITIONS

#### Township Setting

The approximate 27 square mile Township of West Windsor is located in central New Jersey and is one of the 13 municipalities in Mercer County. It is bounded by Princeton, Lawrence, East Windsor, Plainsboro, Hamilton and Washington Townships. By highway mileage figures, the

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municipality is nearly equidistant from New York City, New York and Philadelphia, Pennsylvania. This location in the corridor between two large cities makes West Windsor a prime location for urban development. In fact, between 1989 and 1999, hundreds of residential dwelling units were built in the Township. However, during that same time period, over 1,000 acres of open space have been permanently preserved.

Historically, growth in the United States has proceeded with little regard for environmental costs. An overall goal of the Conservation Element and the creation of the ERI on which it is based is to protect the varied environmental resources of the Township, while simultaneously accommodating growth and development. Environmental protection and economic vitality are not mutually exclusive. The information contained in this document distinguishes between those portions of the Township that are highly sensitive to disturbance and those areas where development is less likely to degrade the environment. When coupled with available social and economic data, this information provides a foundation for land use decisions in the Township.

### **Basemap**

The **base map** used in the Conservation Element and ERI is a copy of the official base map of the Township, including all filed maps and approved subdivisions as of January 1, 2000. The base map identifies surface water located within the Township, such as Lake Mercer, Grovers Mill Pond, Millstone River, Delaware & Raritan Canal and Duck Pond Run.

In order to facilitate the effectiveness of the Conservation Element and ERI for the Township Government and its constituents, the Environmental Commission proposes that an electronic version of the base map be made available upon the request of any interested party. Such availability could facilitate the submission of electronic site-specific information to the Township from developers, state government and environmental groups, thus improving the exchange of information and enhancing planning activities.

### **Geology**

The **geologic map** in this section shows the five basic geologic formations found in West Windsor Township. Geologic maps show the distribution of rocks of different kinds and ages that lie directly beneath the loose rock and soil covering most areas of the surface. Of the five geologic formations shown on the map, the Pleistocene formation is the most recent; it overlies all the other formations and consists of a thin sand-gravel-rocky veneer that was deposited as stream gradients changed during the Ice Age. In the Pleistocene formation a large percentage of unconsolidated materials are present and generally range from less than three feet to over ten feet in thickness. In the early days of agricultural activity in the Township, rocks formed the boundaries of farm fields and were a testament to the amount of large, unconsolidated material found on the surface.

The Merchantville Clay and Magothy-Raritan formations, which are also sedimentary deposits, are considerably older than the Pleistocene formation. The Merchantville Clay is the more recent of the two. Chemical weathering of the primary minerals and the formation of silicate clay minerals have taken place in most soils of the Township. The clays are composed for the most part of kaolinite, illite, chlorite, vermiculite, and quartz, whether the parent material was shale sandstone or diabase of the Piedmont or the clay, silt and sand deposits of the Coastal Plain. As a group, clays are known by their amorphous form, softness, low density and ability to become plastic when wet. The Magothy-Raritan formation is an excellent aquifer composed of alternating sands and clays. It is deeper than other formations that also act as local aquifers. It is probably the

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most important aquifer in the southern half of the state. The three geologic strata described above dip gently in a southeasterly direction, as can be seen on the cross-sectional diagram.

The Wissahickon Schist and Stockton Sandstone formations are older, consolidated rock structures. The Wissahickon Schist is a class of crystalline rock whose constituent minerals have a more or less parallel arrangement, due mostly to metamorphic action. The Stockton Sandstone formation was formed by the consolidation of sand, the grains being held together by a cement of silica, lime, gypsum or clay. A few exposed schist and sandstone outcrops can be found in the northwest section of the Township; however, Pleistocene deposits cover most of the consolidated rock. The Wissahickon Schist is also partly covered by the Magothy-Raritan deposits.

### **Topography**

**Topographic maps** are used to show the height of land surfaces above sea level. Contour lines are plotted to join locations of equivalent elevations. West Windsor Township is relatively flat, with elevations ranging between 60 and 100 feet above sea level. A detailed **topographic map** with 2-foot contour intervals is available from the US Geological Survey office on quadrangle maps for the Princeton, Allentown, Hightstown and Trenton East sections. On that map, features such as stream valleys and ridge lines are easily identified.

Slope is defined as the vertical change in elevation over a horizontal distance, and it is usually expressed as a percentage. It is an important determinant of land use. For example, slopes less than 10% are suitable for most uses, although drainage problems may exist where the slope is less than 2 percent. Slope values between 10% and 15% impose some limitations on development. Sites may require grading or the special design of septic systems, and agriculture is not always feasible. Slopes exceeding 15% pose a significant constraint on development. Extensive grading and filling is required for most residential and industrial development occurring on steep-sloped land, and the operation of heavy earth-moving equipment is more hazardous on steep slopes. Clearing of steep sites can cause erosion and sedimentation problems if runoff is not strictly controlled. Use of septic systems is difficult, although steep slopes can accommodate large lot, single-family development if construction is sensitively planned.

Steep slopes are not common in West Windsor Township. Most occur along streams and are wooded, and they coincide with valuable wildlife habitats and are an aesthetic resource. These values, as well as the constraints imposed on the development of steep slopes, must be considered when planning for the use of such areas.

### **Climate**

In West Windsor Township, as in any part of the country, climate is based on prevailing air currents, fluctuations in temperature, seasonal precipitation and topographical protection from wind. Climate data can be obtained from the Office of the NJ State Climatologist at Rutgers University, New Brunswick, NJ. Recently, a website (<http://climate.rutgers.edu/stateclim/>) has been developed as a source of information. Data is collected from various sites throughout New Jersey, where in some instances averages must be calculated with respect to West Windsor Township. Most comparable data has been obtained, when available, from the Hightstown, New Jersey station.

### **Prevailing Air Currents**

The average wind speed and direction at the surface of the earth most commonly define prevailing air currents. Wind speed and direction (referenced to true North) in West Windsor

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(WW) are based on seasonal averages measured at the Newark (Nwk) and Atlantic City (A.C.) stations. Values are means in miles per hour, and direction in capital letters with > signifying a change in direction from month to month within the season.

	<b>Winter</b>	<b>Spring</b>	<b>Summer</b>	<b>Fall</b>
<b>A.C.</b>	10.8 WNW>W	11.1WNW>S	8.43 S	9.0 ENE>W
<b>Nwk</b>	10.96 SW>NE>NW	11.03 NW>WNW	9.03 SW	9.53 SW
<b>WW</b>	10.88 mph	11.07 mph	8.73 mph	9.27 mph

The direction of air currents on a seasonal average in West Windsor Township must be extrapolated from the directions measured at the Atlantic City and Newark sites.

**Maximum/Minimum Fluctuations in Temperature**

Fluctuations in temperature are listed according to daily maximum and minimum, seasonal average, and record high and low. Values are means in degrees Fahrenheit.

	<b>Winter</b>	<b>Spring</b>	<b>Summer</b>	<b>Fall</b>
<b>WW</b>	39.9 max	60.83 max	82.9 max	65.27 max
	22.57 min	39.43 min	61.1 min	44.0 min
	31.24 avg	50.13 avg	72.0 avg	54.64 avg
	75 high*	93.45 high*	103.65 high*	92.5 high*
	-7.3 low*	16.15 low*	43.1 low*	23.3 low*

\* data extrapolated from the A.C. and Nwk stations

**Seasonal Precipitation**

Seasonal precipitation is measured in inches and divided into two groups, i.e. water equivalent and snow/ice pellets. Seasonal water equivalent values are reflected by normal averages, maximums, minimums and 24-hour maximums. Seasonal snow/ice pellets measurements reflect maximums and 24-hour maximums. Total precipitation values are based on seasonal averages measured at the Hightstown station.

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Winter	Spring	Summer	Fall
<b>Water Equivalent</b>			
A.C. 3.43 nl 7.01 max 0.57 min 2.73 max 24h	3.44 nl 8.75 max 0.62 min 3.39 max 24h	<b>3.84</b> nl 10.48 max 0.32 min 5.26 max 24h	3.23 nl 7.81 max 0.41 min 3.62 max 24h
Nwk3.2 nl 8.17 max 0.65 min 2.94 max 24h	3.77 nl 10.83 max 0.84 min <b>3.54</b> max 24h	3.7 nl 9.41 max 0.49 min 4.59 max 24h	3.45 nl 10.0 max 0.56 min 5.18 max 24h
WW 3.31 nl 7.59 max 0.61 min <b>2.84 max 24h</b>	3.61 nl 9.79 max 0.73 min 3.47 max <b>24h</b>	3.77 nl <b>9.95</b> max 0.41 min <b>4.93 max 24h</b>	<b>3.34</b> nl 8.91 max <b>0.49</b> min <b>4.4 max 24h</b>

<b>Snow/Ice pellets</b>			
A.C. 21.6 max 13.63 max 24h	7.17 max 5.13 max 24h	0.0 max 0.0 max 24h	2.6 max 2.6 max 24h
Nwk27.53 max 21.26 max 24h	13.27 max 10.13 max 24h	0.0 max 0.0 max 24h	2 max 2 max 24h
WW 24.57 max 17.45 max <b>24h</b>	10.22 max 7.63 max 24h	0.0 max 0.0 max 24h	2.4 max 2.4 max 24h
<b>Total Precipitation</b>			
<b>3.28 nl</b>	<b>3.94 nl</b>	<b>4.37 nl</b>	<b>3.69 nl</b>

**Wind Rose**

Wind Roses are the direction and frequency of winds for a specific geographic area. For West Windsor Township, the seasonal wind roses indicate that, in the winter months, the wind is mainly from a west to northwest direction. As the seasons progress into spring and summer, the winds shift to a more westerly direction. In October, winds begin shifting back to the northwest. Wind roses can be used for developing energy conservation measures in site planning. Topographical protection for wind is essentially a non-factor in West Windsor Township because elevation fluctuates only between 60 and 100 feet. However, low-lying areas, such as wetlands, tend to be fog-bound depending on the weather conditions at any given time.

**Sun Arc**

The sun arc describes the sun's changes in position both seasonally and throughout daylight hours. Such a diagram is a tool used in solar access planning to determine the appropriate placement of solar collectors in relationship to nearby trees, structures, and other obstructions. The sun arc can illustrate the position of the sun from 1) east to west (azimuth) and 2) height above the horizon (altitude). Altitude is measured in degrees from 0 to 90, with 0 being sunrise/sunset and 90 signifying that the sun is directly overhead (noon). Solar azimuth is measured in the number of degrees from true south, with a negative value to the east and a positive value to the west. Solar angles (azimuth and altitude) determine the area of the sky that a solar collection system must "see" to perform effectively. This area is called the "skyspace". The

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skyspace should be clear of shading from trees and other sun blocking structures. In the northern hemisphere, usable skyspace is between an azimuth of plus 45 to minus 45. The altitudes of the sun on December 21 and June 21 determine the upper and lower boundaries of the skyspace. In most cases, the lowest altitude reached by the sun on December 21 produces the longest shadows of the year and determines the minimum distance between the passive or active solar collection system and adjacent buildings or obstructions.

### AIR QUALITY

#### Standards

Air quality is based on The Clean Air Act (last amended in 1990) which requires EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. Two types of standards have been established — Primary standards set limits to protect public health "sensitive" populations such as asthmatics, children and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

The United States Environmental Protection Agency (USEPA) has set NAAQS for six principal "criteria" pollutants that are listed below. Ozone standards have been listed as well for informational purposes only. A 1999 federal court ruling blocked implementation of these standards which USEPA has asked the U.S. Supreme Court to reconsider that decision. Units of measure for these standards are in parts per million (ppm) by volume, milligrams per cubic meter of air (mg/m<sup>3</sup>), and micrograms per cubic meter of air (ug/m<sup>3</sup>).

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<b>Pollutant</b>	<b>Standard</b>	<b>Averaging Period</b>	<b>New Jersey/National</b>
Carbon Monoxide (CO)	P&S*	8-hour average	10mg/m3 (9ppm)
	P&S	1-hour average	40 mg/m3 (35ppm)
Nitrogen Dioxide (NO2)	P&S	12-mo.arith.mean (.05 ppm)	100 ug/m3
Lead (Pb)	P&S	3-month average Quarterly Mean	1.5 ug /m3 same
Ozone (O3)	Primary	Max. Daily 1-hour average	.12 ppm (235 ug /m3)
	Secondary	1-hour average	.08 ppm (160 ug /m3)
	P&S	8-hour average	.08 ppm (160 ug /m3)
Sulfur Dioxide (SO2)	Primary	12-mo.arith.mean	80 ug /m3 (.03 ppm)
	Primary	24-hour average	365 ug /m3 (.14 ppm)
	Secondary	12-month arith.	60 ug /m3 (.02 ppm)
	Secondary	24-hour average	260 ug /m3 (.1 ppm)
Particulate (PM 10) particles with diameters 10 micrometers or less	P&S	Annual arith mean	50 ug /m3
		24-hour average	150 ug /m3
Particulate (PM 2.5) particles with diameters 2.5 micrometers or less	P&S	Annual arith mean	15 ug /m3
		24-hour average	65 ug /m3

**Air Monitoring Sites and Statistics**

A daily air quality summary known as the Pollutant Standards Index (PSI) is provided to various public media sources. New Jersey is divided into 9 PSI recording regions within each various pollutants are measured. Each pollutant is given a numerical PSI rating based on the concentration recorded for the previous day. The daily numerical PSI rating for the recording region is equal to the highest rating achieved by ANY pollutant within that region. A PSI rating of 100 or greater indicates that at least ONE pollutant in the recording region has REACHED/EXCEEDED a primary ambient air quality standard. PSI numerical ratings are described as follows: 0-50 good; 51-80 moderate; 81-100 approaching unhealthy; 101-200 unhealthy; 201-300 very unhealthy. A telephone recording of the PSI forecast is taped by 11 a.m., Monday through Friday, and can be heard by dialing 1-800-792-0160.

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The Central Delaware Valley Recording Region includes West Windsor Township. Within our region, pollutants are measured at the Burlington, Colliers Mills, and Rider University monitoring sites. Additionally, a Trenton monitoring site is used for Particulate (PM-10) recordings. A comparison of PSI ratings (1998 annual summary) between the Central Delaware Valley and Statewide recordings in number of days is shown below:

<b>Descriptor Ratings (days)</b>				
	<b>Good</b>	<b>Moderate</b>	<b>Approaching Unhealthy</b>	<b>Unhealthy</b>
C. Delaware Valley	207	100	41	17
Statewide	56	214	46	49

Additional information on pollutants may be found in the 1998 Air Quality Report by the NJDEP Bureau of Air Monitoring. A web site, <http://www.state.nj.us/dep/airmon>, may also be accessed for current air quality levels.

### **Sources of Air Pollution**

There are three specific static sources of air pollution identified in West Windsor Township. Persistent usage of agricultural biocides by our farming community is a significant source of air pollution despite stringent State and Federal regulations. The township contracted compost station is another source of intermittent odor/air pollution. Lastly, an incinerator located at the BASF facility on Clarksville Road is a source of air pollution. This incinerator is regulated by NJDEP.

Major vehicular air pollution in West Windsor Township is primarily generated along the Route 1 corridor. Increased traffic on this North/South route, particularly during rush hour periods, generates significant air pollution from both gasoline and diesel powered vehicles. Construction of the Meadow Road overpass and the proposed Millstone Bypass should improve the flow of traffic with less emissions from stopped/slowed traffic. Route 571 is also handling increasing amounts of traffic as an East/West connector between the NJ Turnpike and Route 1. Proposed Route 92 in Middlesex County will provide an alternative connector decreasing the traffic volume on Route 571.

### **Radon**

Radon, a naturally occurring radioactive gas that enters homes through cracks and other openings in the foundation, is a well documented carcinogen causing an estimated 15,000 to 20,000 lung cancer deaths each year. Radon gas concentrations of 4 picocuries per liter (pCi/l) or more in the lowest livable level of any home is a significant risk for developing lung cancer. Serious steps to reduce radon levels should be taken to markedly reduce this risk. NJDEP recommends radon testing as part of any real estate transaction.

NJDEP has developed a Tier System that classifies municipalities as having high, moderate or low potential for indoor radon problems. This system is based on the percentage of homes with radon concentrations greater than or equal to 4 (pCi/l).

Tier 1: High Potential — at least 25 homes tested with 25% or more having radon concentrations greater than or equal to 4 pCi/l.

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Tier 2: Moderate Potential — at least 25 homes tested with 5 - 24% having radon concentrations greater than or equal to 4 pCi/l.

Tier 3: Low Potential — at least 25 homes tested with less than 5% having radon concentrations greater than or equal to 4 pCi/l.

Based upon the fact that out of 1,584 homes tested for radon, 214 homes or 14% measured greater than 4 pCi/l, West Windsor Township is considered to be a Tier 2 municipality. Additional information on radon, such as health risks from radon, testing and mitigation options (including listings of New Jersey certified measurement and mitigation businesses) may be obtained from the NJDEP Radon information line at 1-800-648-0394. A website is also available at [www.state.nj.us/dep/rpp/index.html](http://www.state.nj.us/dep/rpp/index.html).

### HYDROLOGY

#### Groundwater

##### Aquifer Characteristics

An aquifer is a body of geologic material that can supply useful quantities of ground water to natural springs and wells. An aquifer is recharged when rainwater seeps down through the soil into an underlying aquifer. There are many natural processes that determine how much rainwater actually reaches and replenishes an aquifer instead of being evaporated, consumed by plants and animals, or simply running off the ground surface into surface water systems.

The protection of both surface and groundwater is important for everyone interested in the quality and availability of clean drinking water. Since approximately 50% of the water used by humans on a daily basis is from groundwater, it is important to identify those parts of the State where groundwater is most likely to be replenished so that attempts to protect these vital resources from pollution and land-use practices that will decrease the quality and availability of clean water.

Well locations and average well yield figures are an indication of the distribution and quantity of groundwater available in the Township. Information is available from the Environmental Commission giving the yields for wells in each formation. Four of the five geologic formations underlying West Windsor Township are important aquifers. The Merchantville Clay formation is not classified as an aquifer because clay beds are too compacted and have too low a permeability to yield much groundwater. The Wissahickon Schist and Stockton Sandstone formations are adequate aquifers. Although they are consolidated rock formations, the upper zone close to the soil is fragmented or weathered, creating water-bearing areas. Water is also contained in fissures running through the solid bedrock. The yield of these aquifers is adequate for residential and some industrial use. The Pleistocene deposits consist of sedimentary layers of varying grain size; yields of wells tapping these deposits depend on the composition of the specific layers penetrated. The Magothy-Raritan formation is an excellent aquifer composed of alternating sands and clays. It is, in fact, the most important aquifer of the Inner Coastal Plain of New Jersey. Because so many users to the east and south of West Windsor Township depend on this aquifer, it is a resource of greater than local concern.

In areas such as West Windsor Township where groundwater is a major source of water supply, knowledge of aquifers' locations and characteristics is a valuable planning tool. Knowledge of the locations of the most reliable aquifers and their relative depths is a significant advantage when large water yields are necessary.

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### Aquifer recharge potential

Those portions of West Windsor Township where aquifers are exposed or covered only by Pleistocene deposits are areas of potential recharge. Groundwater supplies are fed by rainfall and streams running over the outcrop area. The most effective and valuable recharge areas, therefore, are those, with the most permeable soils. Soils are usually two to five feet thick, consisting of layers or horizons of unconsolidated material. The recharge potential of a given soil type depends upon the permeability of its least pervious horizon.

Assessing the aquifer recharge potential combines a knowledge of geology and soil characteristics to distinguish between areas of high recharge where surface water and precipitation easily penetrate to the groundwater supply, and areas of low recharge with low permeability rates and minimal groundwater storage. The most important recharge areas are those having soil percolation rates greater than 6.3 inches/hour. This means that water poured onto the soil will percolate more than 6.3 inches in one hour.

The Magothy-Raritan formation is the aquifer of regional importance. Water recharge in West Windsor outcrops affects users to the southeast in Monmouth County. The Stockton Sandstone and Wissahickon Schist formations are locally important aquifers. Because of its low permeability, the Merchantville Clay formation has no significant aquifer recharge potential. In the upper Pleistocene formation, recharge areas are as variable as the nature of the deposits themselves. These recharge areas were not mapped so recharge for more important, deeper aquifers could be shown.

Recently, the New Jersey Geological Survey (NJGS) developed a method for mapping aquifer recharge areas. The method uses rainfall data from climate-monitoring stations, maps showing how the land surface is currently used (e.g. residential, agricultural, commercial, wooded and pavement), what kind of soils occur at the earth's surface, and the extent of wetlands (streams, rivers, lakes, marshes, and bogs). These data are combined using scientific methods to determine how much ground water is available in any particular area for recharge to the local aquifer. How much of this water will actually make it into the aquifer is also predicted based on how much water can usually be pumped from water wells drilled into the aquifer.

The West Windsor Environmental Commission strongly recommends that the newly developed NJGS method for mapping recharge areas be applied lands within the Township as soon as practically possible.

Irrespective of the accuracy of the attached map, if groundwater withdrawal is to continue at its present rate or increased, adequate recharge of important aquifers must be maintained. The Township should avoid extensive development over recharge areas which would reduce the quantity of percolation reaching the aquifer. A developer contemplating the use of a land parcel should consider placing homes, parking lots, and other impervious surfaces over areas with low recharge potential and keeping high recharge potential areas in open space.

Also, there is a direct connection between groundwater levels and surface water conditions. If aquifer recharge is significantly lessened, stream flow may be reduced, small streams may dry up, and well yields decrease. Since the Magothy-Raritan formation extends under Raritan Bay, continued pumping of the aquifer at reduced recharge rates could induce saltwater intrusion into the eastern portions of the state and contaminate the well water with salt. Aquifers may be contaminated by poorly planned or maintained landfills and septic systems located over recharge areas. The high permeability of soil is the outstanding feature of a prime recharge area, but rapid percolation through these soils may not allow sufficient purification of effluent or leachate.

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Contamination of the Magothy-Raritan aquifer may not be apparent for many years, as the water travels very slowly within the formation. It is estimated that water entering the Magothy-Raritan aquifer in West Windsor Township will be drawn from wells in Freehold approximately 100 years later.

### Depth to Seasonally High Water Table

One of the most valuable pieces of information about a site is the depth to the water table. The water table is the top of a layer of soil saturated by groundwater and its depth is measured from the surface of the soil. Water table groundwater is not the same as water held in aquifers, which are geologic formations. The water table is often "perched" above an aquifer. However, the water table is also an important ecological resource and constraint on development. The water table is replenished by percolation from rainfall, irrigation and septic tank drainage fields. The depth of the water table varies according to rainfall, topography and soil permeability, as shown on the cross-sectional diagram below. The force of gravity causes groundwater near hill crests to flow slowly toward surface water bodies, where the groundwater is discharged to the stream or pond.

The water in the saturated zone of the soil is an essential environmental resource. It is the source of water which maintains vegetative growth. It also serves to recharge deeper underlying aquifers. Groundwater replenishes surface water resources and provides the major source of stream flow during dry periods.

At the same time, however, the depth of the water table may present a severe constraint to development. The New Jersey State Standards for the Construction of Individual Subsurface Sewage Disposal Systems requires a minimum depth to water table of four feet from the bottom of the disposal trench or bed for the installation of septic tanks and tile fields. This is a minimum depth to water table of six feet from the ground surface. Degradation of the water table not only impacts overall ground-water quality, but may eventually pollute surface water supplies as well. Cellar installation is infeasible if the depth to the water table is less than five or six feet. Although artificial drainage may be used to lower a seasonally high water table, an estimation of the potential effectiveness of such systems requires that features unique to each site be evaluated.

### **Surface Water**

#### Watersheds

A watershed is any geographic area within which water, sediments and dissolved materials drain to a particular receiving surface water body such as a river, lake or stream. Watershed management is the process of managing all of the water and water-related resources within the entire area of a watershed, instead of on a site-specific basis. Watersheds can be identified at different scales. The State of New Jersey is divided into 20 Watershed Management Areas. The Township of West Windsor is divided between WMA 10 and WMA 11. The former WMA drains north toward New York City, while the latter drains south toward Philadelphia. Each WMA is divided into subwatershed.

Below is a listing of the watersheds and sub-watersheds of importance to West Windsor.

#### WMA 10:

Stony Brook (HUC 02030105090), Watershed Identification 10AA

Duck Pond Run (HUC 02030105090080), Subwatershed Identification 10AA08

Millstone River, above Carnegie Lake (HUC 02030105100), Watershed Identification 10BA

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Bear Brook, below Trenton Road) (HUC 02030105100130), Subwatershed Identification 10BA13

Millstone River, Route 1 to Cranbury Brook (HUC 02030105100140), Subwatershed Identification 10BA14

Millstone River, Cranbury Brook to Rocky Brook (HUC 02030105100060), Subwater shed Identification 10BA06

WMA 11:

Assunpink Creek, (HUC 02040105230), Watershed Identification 11DA

Assunpink Creek, Trenton Rd. to New Sharon Bridge (HUC 02040105230040), Subwatershed Identification 11DA04

Assunpink Creek, Shipetaukin to Trenton Road (HUC 0204015230050, Subwatershed Identification 11DA05

Miry Run (HUC 02040105240030), Subwatershed Identification 11B03

HUC is the hydrologic coding unit, as defined by the United States Geologic Survey. The HUC numbers define the water segment and the surrounding land mass that makes up the particular watershed. A subwatershed is a portion of the watershed in which it is located. The Watershed Identification number is the State generated identification for the Federal HUC coding.

### Streams, Rivers and Lakes

There are eight rivers in the Township, namely Millstone River, Duck Pond Run, Assunpink Creek, Bridegroom Run, Canoe Brook, Big Bear Brook, Little Bear Brook and the Delaware Raritan Canal. There are also two lakes, the Mercer Lake, within the Mercer County Park and Grovers Mill Pond.

Some streams in West Windsor Township are first order streams, or unbranched tributaries to larger streams. First order streams experience very low flows during dry periods, making them extremely vulnerable to degradation. Pollution of these streams has far-reaching impacts on the water quality of water bodies downstream. Little Bear Brook, Canoe Brook, and portions of Duck Pond Run are first order streams in West Windsor Township.

As land uses/land coverages change, due to development, from a more pervious state to a more impervious state, less rainwater soaks directly into the ground. As a result of this change in rainwater hydrodynamics, pollutants, washed from parking lots, streets and fertilized lawns at a scouring force, end up in streams. The turbulent stream flows cause stream bank erosion. The evidence of stream bank erosion is the visual appearance of vertical or caved in banks. The stream channels become filled with silt and sedimentation, thus impacting the biological life in the stream and surrounding environment. Recent advances in stream bank restoration or bioengineering have emerged, thus reducing the negative impact of development. In 2000, the Environmental Commission contracted with an outside agency to develop a stream corridor restoration assessment. That work included both a reconnaissance survey and an outline of a stream corridor restoration master plan. Although a formal report was not prepared, the contractor provided the Township with copies of all materials used in a presentation to the Environmental Commission, including PowerPoint slides, Arcview maps and programs, as well as a detailed photo log of the field reconnaissance. That information is available at the Township Hall, during

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normal business hours. The consultant concluded that West Windsor stream corridors are in a generally good condition and that stream bank erosion/stability is not a major problem. However, sediment and erosion controls need improvement. The Environmental Commission will undertake further investigations into methods to achieve such improvements.

Mercer Lake and its immediate area are within the Mercer County Park System under the jurisdiction of Mercer County. However, upstream conditions, outside of the jurisdiction of the county authority and within the jurisdiction of West Windsor Township Government, impact the health of this lake and the downstream environment. Therefore, the Township should implement best management practices to reduce non-point source pollution into the lake. Grovers Mill Pond has for many years experienced excessive eutrophication, i.e. the excessive growth of biota and the reduction of oxygen concentration in the pond. This negatively impacts the lake's plant and fish life, and makes the pond unpleasant to view. For several years, the Township has been moving forward on addressing this issue. However, much work remains to be completed. Therefore, the Environmental Commission encourages the work on the pond to continue as diligently as possible in order to bring the pond back into environmental balance.

### Flood Hazard Areas

Flood plains are usually flat areas of land bordering streams, which are periodically inundated by floodwaters. Generally, only rare rainstorms of severe intensity cause the entire flood plain to flood. On the Flood Hazard Area Map, the 100-year and 500-year flood boundaries have been delineated.<sup>2</sup> The boundary was developed from a series of 10 maps prepared by the Federal Emergency Management Agency (FEMA) as part of the National Flood Insurance Program for the Township.

The narrow floodway is a zone of high flood intensity, where the water flows fastest and deepest. The flood hazard area, which is subject to slower flows and shallow inundation, delineates the extent of floodwaters that could be expected to occur once every 100 years.<sup>2</sup> FEMA uses the theoretical extent of a flood occurring once every 100 years to determine eligibility for Federal Flood Insurance.

Flood plains are areas of substantial ecological value. The sediments deposited in the flood plain by slow-moving floodwaters increase the fertility of the land. Where flood plains are undeveloped, the natural shrub and lowland forest vegetation provide excellent habitat for wildlife. Proximity to water heightens the flood plains' value to wildlife, and overhanging vegetation offers shade and refuge for stream organisms and helps maintain natural stream temperatures. Vegetated floodplains can also act to filter out non-point source pollutants before they enter streams, thus providing a natural mechanism for water quality benefits. Flood plains are excellent locations for water-related recreation sites, as well as for nature study. Since standing floodwaters are steadily absorbed by flood plain soils, groundwater supplies are maintained and flood peaks downstream are reduced.

Although flood plains are attractive sites for development due to their flat terrain and proximity to water, building in them will inevitably result in significant flood-related damages and even danger to life. Any structures or paved surfaces in the flood plain prevent absorption and obstruct flood flows, thereby eliminating valuable groundwater recharge sites and increasing flood peaks.

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<sup>2</sup> The probability of a flood inundating the flood hazard area once every 100 years is based on a statistical evaluation of rainfall and stream flow records. The occurrence of a 100-year flood does not preclude another flood of similar magnitude occurring again the next year, or even the same year. Only over a lengthy period would one expect that a 100-year flood would, on the average, occur once every 100 years. Also, the 100 year flood hazard area delineation may expand in the future due to increased runoff caused by impervious surfaces such as streets, roads, and parking lots associated with future development.

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Structural controls designed to channel or retain floodwaters, such as levees and dams, may cause greater damage than would have occurred without them. Incorrectly designed dams can fail; releasing quantities of water that far exceed the retention capabilities of the flood plain.

Proper flood plain planning reduces damages associated with their development and ensures the perpetuation of the important ecological functions of flood plains. Uses that are not significantly harmed by periodic flooding, such as agriculture, recreation, and nature study, should be encouraged. If some building must occur, structures should be flood-proofed.

### Water Quality

West Windsor Township had, for a period of time, a sampling program to monitor surface water quality in the Township. This information was used to monitor surface water quality and to identify any trends or significant changes. The sampling program included pollutants such as total coliform, fecal coliform, biochemical oxygen demand, chemical oxygen demand, total suspended solids, pH, and total phosphorus. The historical data is available for inspection at the Municipal Building, during normal working hours.

Recently, the Township's Environmental Commission suspended the sampling program for several reasons, namely:

- The United States Geological Survey conducts an extensive monitoring program throughout the entire State of New Jersey. The USGS has several stations in the area of the Township of West Windsor. Water quality trends could be developed using those data.
- The NJDEP conducts an extensive monitoring program throughout the entire State of New Jersey. The NJDEP has several stations in the area of the Township of West Windsor. Water quality is developed using those data. In fact, by Federal requirements, the NJDEP must assess the water quality in the entire State and report those findings to the USEPA in a report known as the 305(b) Report. For those surface waters that do not meet applicable surface water quality standards, the NJDEP must develop watershed management strategies, which focus on the elimination of the causes of pollution. Those management strategies will address both point sources, those from wastewater treatment plants and nonpoint sources, those from, for example, storm water run off from fertilized lands.
- Local and regional watershed associations also conduct less extensive monitoring programs in the area of the Township. Less scientific, yet valuable, trend analysis could be developed using those data. The reader is directed to those entities listed above, as well as the local Board of Health, for the most recent information as to the quality of the surface waters within the Township.

### **SOILS**

#### **New Jersey Physiographic Region and Sub Regions**

The state of New Jersey is divided into four geomorphic regions based on the northeast to southwest trend in geological formations and by characteristics of underlying rocks (Wolfe, 1977). The four regions are known as the valley and ridge, highlands, piedmont lowlands, and coastal plain regions. The Township of West Windsor has the distinction of being located within two of the regions, the piedmont lowlands and the coastal plain. The divide between the two regions is located in roughly the same location as the railroad tracks as they bisect the township in a southwesterly to northeasterly direction.

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The piedmont region is characterized by topography that gently undulates and slopes from the highlands to the coastal plain. Rocks in this region consist of soft red shales, with areas of sandstone, siltstone, resistant argillites and volcanic rocks. In West Windsor this region occurs in the northwest of the railroad tracks. To the southeast of the piedmont lowland region is the coastal plain region, which is the largest physiographic region in New Jersey. This region is characterized by gently southeastwardly dipping unconsolidated clays, marls, silts and sands with interglacial gravel caps on hills and watershed divides (Wolfe, 1977). This region is located to the southeast of the railroad tracks.

### Soil Types

One of the most important planning tools is an accurate map of soil types. The structure and composition of each particular soil determines its fertility and suitability for various kinds of land development. Soil lies in a very thin layer above bedrock and extends approximately to the depth of plant roots. It is composed of both inorganic and organic materials. The primary inorganic constituent is extensively weathered parent rock, or bedrock. Soils which overlie the same types of bedrock have similar characteristics because of their common origin. The organic component of soil is derived from decayed plant and animal material. One important feature of soil is its texture, determined by the relative proportions of sand, silt and gravel. The permeability of soil is directly related to its texture. Soils also vary in their structure, as the individual grains can cohere to form blocky, granular or flaky pieces of soil. Soil structure also affects percolation, ease of cultivation, and susceptibility to erosion. As a result of leaching, all soils in West Windsor Township are naturally either strongly acidic or extremely acidic.

The letters shown on the Soils Type Exhibit identify soil types mapped and listed in the Mercer County *Soil Survey*, published by the Soil Conservation Service in 1972. The *Soil Survey* lists all the features of each soil type useful in determining its suitability for agriculture and development for a variety of land uses. Please refer to the soil matrix accompanying this text for more detailed information concerning soils occurring in the Township. The soil map is the basis for the following interpretive maps in the Inventory:

1. Hydrology
2. Vegetation
3. Wetlands
4. Land Use/Land Cover
5. Critical Environmental Areas

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Map Symbol	Soil Group	Slope (percent)	Erosion Hazard (KR(LS) for 10-foot slope)	Drainage Classification	Depth to Bedrock (feet)	Depth to Seasonally High Water Table	Runoff Potential (Hydrologic Soil Group)	Suitability for Septic Drainage Field	Percent In TWP	Map Symbol
DwB	Dragston and Woodstown sandy barns, 0-4% slope	0-4	3	Moderately	10+	Shallow-moderate	C	Moderate	6.16	DwB
Fd	Fallington sandy loam	Low	3	Poorly	10+	Very shallow	D	Severe	2.36	Fd
KsC	Klinesville shaly loam	6-12	3	Moderately	3-4	Shallow	B	Severe	0.42	KsC
Km	Kleg soils, sandy loam subsoil variants	0-3	4	Moderately	10+	Shallow-moderate	B	Moderate	4.20	Km
Pu	Plummer sandy loam	Low	2	Poorly	10+	Very shallow	D	Severe	2.10	Pu
Pv	Mummer sandy loam, very wet	Low	2	Poorly	10+	Very shallow	D	Severe	0.20	Pv
WfB	Woodstown-Fallington sandy barns, gently undulating	2-5	7	Moderately	10+	Shallow-moderate	C	Moderate	1.19	WfB
Bt	Bowmansville silt loam	0-2	5	Poorly	3-5+	Very shallow	C	Severe	0.24	Bt
Ek	Elkton silt loam	Low	5	Poorly	10+	Very shallow	D	Severe	0.95	Ek
Lk	Lenoir-Keyport silt looms	0-5	5	Poorly	10+	Shallow-moderate	C	Severe	0.26	Lk
Ot	Othello silt loam	0-3	4	Moderately	10+	Very shallow	D	Severe	7.04	Ot
Pw	Portsmouth silt loam, thin surface variant	Low	3	Poorly	10+	Very shallow	D	Severe	1.71	Pw
RaA	Readington and Abbottstown silt loams, 0-2% slope	0-2	5	Moderately	3-4	Shallow-moderate	C	Moderate	0.04	RaA
Ad	Alluvial land (wet)	Low	0	Poorly	-	Very shallow	D	Severe	2.36	Ad
Ae	Alluvial land (very wet)	Low	0	Poorly	-	Very shallow	D	Severe	2.87	Ae
BoB	Birdsboro soils, gravelly solum variants, 0-5% slope	0-5	6	Well	10+	Deep	B	Slight	1.11	BoB
Cg	Cut and fill land, gravelly material	0-5	12	Well	-	Deep	A	Slight	0.82	Cg
Cu	Cut and fill land, stratified substratum	0-5	12	Well	-	Deep	A	Slight	0.06	Cu
Fm	Fresh water marsh	Low	0	Poorly	-	Very shallow	D	Severe	2.49	Fm
Pg	Pits	-	12	-	-	-	A	Severe	0.03	Pg
SdD	Sandy and silty land, strongly sloping	High	27	Well	-	Moderately deep	B	Moderate	0.49	SdD
SdE	Sandy and silty land, steep	High	50	Well	-	Moderately deep	B	Moderate	0.30	SdE
SrA	Sassafras sandy loam, 0-2% slope	0-2	3	Well	10+	Moderately deep	B	Slight	3.41	SrA
SrB	Sassafras sandy loam, 2-5% slope	2-5	9	Well	10+	Moderately deep	B	Slight	11.62	SrB
SrC	Sassafras sandy loam, gently undulating	5-10	12	Well	10+	Moderately deep	B	Slight	10.05	SrC
SrC2	Sassafras sandy loam, 5-10% slope, eroded	5-10	20	Well	10+	Moderately deep	B	Slight	2.36	SrC2
SsB	Sassafras gravelly sandy loam, 2-5% slope	2-5	6	Well	10+	Moderately deep	B	Slight	3.16	SsB
StC3	Sassafras sandy clay loam, 5-10% slope, severely eroded	5-10	24	Well	10+	Moderately deep	B	Slight	0.59	StC3
Syb	Sassafras-Woodstown sandy foams, gently undulating	0-5	8	Moderately	10+	Shallow-moderate	C	Moderate	1.60	Syb
AfB	Aura sandy loam, moderately firm, 2-5% slope	2-5	10	Well	10+	Deep	B	Slight	0.29	AfB
AfC	Aura sandy loam, moderately firm, 5-10% slope	5-10	23	Well	10+	Deep	B	Slight	0.15	AfC
Df	Downer fine sandy loam, gravelly clay loam substratum	0-5	7	Well	10+	Deep	B	Slight	0.52	Df
EvB	Evesboro loamy sand, 0-5% slopes	0-5	5	Well	10+	Deep	A	Slight	2.56	EvB
FrB	Fort Mott loamy sand, 0-5% slope	0-5	6	Well	10+	Deep	A	Slight	2.53	FrB
FrC	Fort Mott loamy sand, 5-10% slope	5-10	12	Well	10+	Deep	A	Slight	0.45	FrC
GaB	Galestown loamy sand, 0-5% slope	0-5	5	Well	10+	Deep	A	Slight	2.95	GaB
GeB	Galestown sandy loam, 0-6% slope	0-6	6	Well	4-8	Moderately deep	A	Slight	2.82	GeB

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LaB	Lansdale sandy loam, 2-6% slope	2-6	8	Well	3.5-6	Deep	B	Moderate	0.37	LaB
LcC2	Lansdale Channery loam, 6-12% slope	6-12	28	Well	3.5 6	Deep	B	Moderate	0.38	LcC2
LcD2	Lansdale Channery loam, 12-18% slope	12-18	52	Well	3 5 6	Deep	B	Moderate	0.11	LcD2
MvB	Mount Lucas, very stony silt loam	0-	6 6	Well	4-8	Deep	B	Moderate	0.24	MvB
MoA	Matapeake loam, 0-2% slope	0-2	4	Well	10+	Moderately deep	B	Moderate	5.72	MoA
MoB	Matapeake loam, 2-5% slope	2-5	10	Well	10+	Moderately <b>deep</b>	B	Moderate	4.53	MoB
MoC2	Matapeake loam, 5-10% slope	5-10	27	Well	10+	Moderately deep	B	Moderate	0.06	MoC2
Mg	Mattapex and Bertie loams	0-5	7	Moderately	10+	Shallow-moderate	C	Moderate	6.35	Mg
Water		-	0	-	-	-	-	-	0.44	Water

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There are 45 different soil types existing in West Windsor and these are indicated on the following "Soils Key." These have been reduced and color coded into the following six broad categories:

- **Red** – Sandy loamy, poorly to moderately drained, shallow depth to highwater and a suitable to moderate erosion hazard.
- **Orange** – Silt loams, poorly to moderately well drained, and suitable erosion hazards.
- **Yellow** – Birdsboro soils, gravelly solum variants, surficial or man-made or no soil classification, depth to bedrock not applicable (except for Birdsboro soils).
- **Green** – Sassafras loamy, grouped together due to the large percentage in the Township. Well drained and moderately deep to high-water.
- **Blue** – Sandy loamy and loamy sands, well drained and deep to highwater table.
- **Violet** – Loams, well drained, moderately deep to highwater table and generally moderately to least suitable erosion hazard.

### Erosion Hazard

Erosion is a naturally occurring process involving the detachment and movement of soil particles by water, wind and gravitational forces. Soil textures and structure determine how easily the soil is displaced. In addition to soil type, other factors, which determine the potential severity of erosion for any particular site include:

- Intensity of wind or rainfall
- Slope
- Type and density of vegetative cover

The categories used to plot erosion hazard on this map reflect the relative potential for soil loss in the Township when slope, vegetative cover, and wind or rain intensity are held constant. The actual soil loss for any particular site in the Township would vary because the slope and degree of vegetative cover are not uniform throughout the Township. Some areas which are classified as low erosion hazard on this map may actually be experiencing deposition of soil from nearby eroding areas.

The natural erosion process which occurs at a gradual pace is often accelerated by man's interference. Development may alter slope and vegetation, with harmful consequences. One result is the loss of productive topsoil. Soil sedimentation on land or water bodies downslope of the eroding site smothers vegetation and can change the stream or lake profile. Increased turbidity from washed-off soil disrupts aquatic life and stream productivity. The map can be used to locate areas of potential hazard where erosion may occur if the sites are developed without mitigation techniques, such as retaining the vegetation cover and installing sedimentation basins.

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### Surface Run Off

Runoff equals total precipitation minus that amount of moisture which infiltrates the soil or evaporates. The quantity of runoff from a site can be calculated from:

- Amount of rainfall
- Type of land use or natural cover
- Hydrologic group of the soil

The rate of runoff depends on the slope of the site. Soil types are assigned to various hydrologic groups according to the rate of infiltration of water into the bare soil after prolonged wetting. Four hydrologic groups are plotted on this map. Soils with a low runoff potential have a high rate of infiltration and are deep and well-drained. Those classified as having moderate runoff potential show a moderate rate of infiltration, moderate depth and drainage. Soils with a moderately high runoff potential have a slow infiltration rate. They may be very finely textured and have a high water table or impermeable layer underneath. High runoff potential soils have a very slow infiltration rate. This may be due to high clay composition, a shallow impermeable layer or a permanently high water table. If the water table is the primary cause of the high runoff potential, artificial drainage improvement may shift the soil to a hydrologic group with a lower potential for runoff.

Knowledge of the hydrologic groups into which the soils of a particular site are assigned can be of great value to developers. Altering vegetative cover over soils with high runoff potentials will increase runoff, and may cause several problems. Increased flash flooding, degradation of surface water quality, and reduced percolation to groundwater supplies are all negative consequences of increased runoff from development sites. These problems can be alleviated by minimizing disturbances of natural cover and by reducing the uses of impervious surfaces. The installation of swales, retention ponds and porous pavements helps retain excess runoff on the site, and allows gradual percolation. This map indicates areas of the Township where development is most likely to cause runoff problems and where ameliorative measures may be called for.

### Farmland

West Windsor Township is endowed with extensive prime agricultural lands suitable for permanent cultivation. The New Jersey State Agricultural Land Value Assessment has classified prime soils into "very productive farm-land" and "good farmland." The qualities of the soils which make them so valuable for cultivation are their fertility, gentle slope, depth, and good drainage. Unfortunately, these four features make these soils highly suitable for urban development as well. The United States, and the East Coast in particular, are rapidly losing their prime agricultural soils to development. The Middle Atlantic region will lose an estimated 9% of its cropland by the year 2000. Escalating land prices and taxes, loss of support services, stricter environmental regulations and urban spillover put great economic pressure on the farmer, often forcing him to sell farmland for development.

There are many reasons for retaining prime soils in agricultural production. These soils represent a non-renewable resource which is irretrievable once the land is transformed by intensive development. The retention of eastern farmland prevents economic dependence on Midwestern and western products. The use of prime farmland for agriculture requires less energy input than the use of marginally productive land. Other values of prime agricultural land are less obvious, and more difficult to quantify. These include the role of prime soils in aquifer recharge, the

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importance of cropland as habitat and feeding grounds for wildlife, and the aesthetically pleasing sense of open space provided by farmland.

The perpetuation of land in agricultural production is an important priority for West Windsor Township. A few of the measures which have been suggested to ease economic pressure on farmers are the establishment of agricultural zoning districts, transfer of development rights on agricultural land, and strict control of water and sewer extensions into prime farmlands and the direct preservation of farms through development right and fee simple purchase. For further discussion of this topic, see the Farmland Preservation Element.

### VEGETATION AND WILDLIFE HABITATS

There is a great diversity of vegetation types in West Windsor Township. Because each animal species differs in its requirements for food and shelter, an area with diverse vegetation and wildlife habitat can support a wide variety of wildlife species. Diverse ecosystems are known to be more resilient to environmental disturbance than are ecosystems characterized by one or two dominant species. The maintenance of a wide spectrum of vegetative types helps to ensure the perpetuation of native wildlife species. Extensive areas of natural vegetation contribute to the general environmental quality of the entire Township. Lush vegetation and dense root structures conserve soil by slowing runoff and erosion. Leafy vegetation and aquatic plants extract and utilize common air and water pollutants. Large stands of mature woodland help to moderate the local climate by breaking the force of winds and trapping heat re-radiated from the earth's surface at night. The scenic value of naturally diverse vegetation makes West Windsor Township an aesthetically pleasing place to live.

Eight categories of vegetation have been identified in West Windsor Township and mapped. More detailed information presented in Appendix B includes the plant species composition of each category as well as an analysis of the distribution of wildlife species according to these vegetation types. The herbaceous freshwater marsh is one of the most valuable yet least appreciated kinds of vegetation. Marshes support a great variety of wildlife and are among the most productive ecosystems in the world. They improve water quality by filtering suspended solids and utilizing nutrients to support plant growth. The spongy organic base, called peat, upon which marsh vegetation grows, is highly absorbent. Marshes play an important role in reducing flood peaks and recharging groundwater supplies. Lowland shrub vegetation provides dense cover for wildlife on flood plains.

The lowland forests are composed of species tolerant of moist conditions. Two types of lowland forest have been identified in the Township, dominated by Red Maple and Sweetgum species, respectively. The greatest number of wildlife species in the Township has been identified in the lowland forest, the majority of which are bird species. The upland forests are located on well-drained soils. One type of upland forest is dominated by oaks and the other is composed of mixed species, with none more prevalent than the others.

The category of open land represents cultivated and fallow fields. Some abandoned fields are in various stages of succession, which involves a natural transition from field to forest. Fields are an important habitat for many birds and rodents as well as a feeding area for forest dwellers. Sod farms are a man-made category of vegetation, as is suburban land. The latter consists of developed areas around Post Corner, Edinburg, Grover's Mill, Princeton Junction and Penn's Neck. Few wildlife species are found on suburban land because of the lack of underbrush and the proximity to humans. The final category is bare land. These are areas that have been cleared or

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paved, have no vegetation, and have no wildlife value.

It is important to maintain a variety of vegetation for aesthetic, educational and ecological reasons. Some kinds of vegetation, however, are more valuable than others due to their role in protecting other environmental resources and their wildlife habitat potential. Sensitive planning should encourage the development of the least useful areas. For example, flood plains, on which some of the most valuable vegetation is found, are already protected by ordinance. Woodlands and other important areas could be incorporated into planned residential developments as open space or zoned for low-density residential use. The Township's Greenbelt Plan is a significant step towards the protection and wise use of the most valuable vegetation and wildlife habitats.

### GREENBELT PLAN

The West Windsor Township Greenbelt is a wide, largely uninterrupted expanse of woodland, meadow and farm fields straddling the major stream corridors of the Township. Its total area is approximately 2,500 acres. It has tremendous value for the protection of the natural environment of West Windsor. Foremost among its attributes is the protection of water resources. Water-oriented Greenbelts provide a vegetative buffer that filters out non-point source pollutants, such as fertilizers and sediments, before they can reach the stream. Forest litter and soil humus also perform important stormwater management functions by reducing runoff and controlling erosion. Tree roots help maintain soil porosity and soil structure. Forests also act to improve air quality by absorbing air pollutants. Large woodland areas will also moderate local weather extremes, providing wind buffers and natural cooling to nearby residences.

Beyond the important water quality protection features, the Greenbelt is also important for the preservation of indigenous vegetation and wildlife in the Township. Large expanses of undisturbed woodland provide stable habitat for many species of birds and mammals. The corridor approach provides long contiguous corridors that permit normal wildlife home range movement. Woodlands with a substantial continuous size must be maintained to allow predominate canopy trees to regenerate and sustain their species.

In addition, woodlands provide nutrients to the ecosystem through the decomposition of leaf litter and other organic matter supporting the bottom of the major food chain. Forest detritus is an important source of nutrients for aquatic organisms. The shading effect of the forest canopy is also important in moderating the temperature of streams, thereby protecting aquatic life from extremes in temperature.

The Greenbelt Plan defines the Greenbelt area to include the maximum extent of the 100-year floodplain, wetlands and wetland buffers, and all significant forests. A minimum band or 400 feet (200 feet from either edge of a stream) is established for the majority of the Greenbelt to achieve the desired environmental benefits and sustainability of habitat. To maintain the important natural functions described above, the Greenbelt Plan calls for the corridor to remain in its natural state. Developments adjacent to the Greenbelt are requested to incorporate the Greenbelt in their open space planning for passive recreation and for stormwater management uses. Extremely limited recreation (i.e. trails) or land development infrastructure (i.e. sanitary sewer) is permitted in some Greenbelt areas. The vast majority of the Greenbelt is intended to remain set aside for the preservation of native flora and fauna.

The establishment and maintenance of the Greenbelt system in West Windsor has been a long-range effort backed by the local government and community, and supported by many large and small land developers in the Township. The benefits are far-reaching. Greenbelt open space with

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preserved woodlands, streams and ponds establishes the pastoral character and identity of West Windsor Township. A preserved Greenbelt will help sustain the high quality natural resources of this area well beyond the present generation inhabiting this land.

The most recent version of the Greenbelt Plan is incorporated into the ERI and into this Conservation Plan Element by reference and is available to the public at the Municipal Building during normal business hours. Recently, the West Windsor Township Environmental Commissions has concluded that the Greenbelt Plan should be a "living" document, in as much that it should be updated, enhanced and revised to reflect both the advancement in environmental goals desired by the Township government or the residents. Therefore, the Environmental Commission shall develop in the near future an updated Greenbelt Plan to reflect current environmental needs. See also a discussion of this topic in the Open Space and Recreation Plan Element.

### WETLANDS

#### Definition

Commonly defined, wetlands are swamps, marshes, and/or bogs. However, many wetlands are forested and do not fit the classic picture of a swamp, marsh or bog, i.e. they may not have standing water. Previously misunderstood as wastelands, wetlands are now being recognized for their vital ecological and socioeconomic contributions. Wetlands provide the following benefits:

- Protection of drinking water by filtering out chemicals, pollutants, and sediments that would otherwise clog and contaminate our waters.
- Collection of heavy rains and snow melts, providing natural flood control.
- Drawdown of stored flood waters during droughts.
- Critical habitats for a major portion of the State's fish and wildlife, including endangered, commercial and recreational species.
- High quality open space for recreation and tourism.

The U.S. Fish and Wildlife Service, Office of Biological Services conducted an inventory of the wetlands of the United States. The National Wetlands Inventory (NWI) established a wetland database in both map and computer forms for the entire country. The NWI involves classifying the nation's wetlands, producing wetlands maps and statistics, and publishing reports on the present status of wetlands across the country and in each state. These maps have become an important starting point for wetlands investigations in all levels of government. The U.S. Fish and Wildlife Service officially adopted the "Classification of Wetlands and Deepwater Habitats of the United States" (1979, by L. N. Cowardin and others) to delineate and classify wetlands. The Cowardin system is hierarchical and structured around a combination of ecological, hydrological, and substrate characteristics. It consists of five systems: Marine (open ocean and associated coastline), Estuarine (salt marshes and brackish tidal waters), Riverine (freshwater rivers, creeks, and streams), Lacustrine (freshwater lakes and deep ponds), and Palustrine (small freshwater ponds, marshes, swamps, and bogs) and proceeds in a hierarchical manner through subsystem, class, and subclass. The classification system also contains provisions to apply modifiers to describe the amount of flooding (water regime), water chemistry, soil type, and the actions of

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man (dredging, draining, etc.).

Completed wetland maps are available in final form for New Jersey. The maps series available for New Jersey display wetlands at the same scale and on the same base of the U.S.G.S. topographic map, namely at a scale of 1:24,000. In West Windsor, and throughout the State, freshwater wetlands and transition areas or "buffers" around freshwater wetlands (up to 150 feet of the wetlands, depending on the quality of the wetlands) are protected under the New Jersey Freshwater Wetlands Protection Act, N.J.S.A. 13:9B.

### **Identifying Factors**

The first step in identifying wetlands is to consult the New Jersey Freshwater Wetlands Maps. The New Jersey Freshwater Wetlands Maps provide guidance on where wetlands are found in New Jersey, but they are not an exact delineation. Only an official determination from the State's Department of Environmental Protection, in the form of a "Letter of Interpretation" (LOI) verifies the presence and associated boundaries of freshwater wetlands and transition areas on any given site. In the past five years, there have been nearly 60 applications for LOIs made to the NJDEP by developers in the Township. A recently developed goal of the Environmental Commission is to develop a process in which State delineated wetlands are incorporated into a GIS database. That information is important to maintain so that the Township can develop a local wetlands inventory map, on a finer scale.

The designation of freshwater wetlands is based upon the three-parameter approach (that is, hydrology, soils and vegetation) enumerated in the "Federal Manual for Identifying and Delineating Jurisdictional Wetlands". For example, vegetative species classified as hydrophytes and indicative of freshwater wetlands include, but are not limited to, those plants listed in "National List of Plant Species that Occur in Wetlands: 1988-New Jersey," compiled by the United States Fish and Wildlife Service in cooperation with the United States Army Corps of Engineers. The three-parameter approach is a methodology for determining, in a consistent and repeatable manner, the presence of wetlands and the boundaries of wetlands. It requires careful consideration of such factors as vegetative species composition, saturated soil conditions, depth to seasonal high water table and the presence or absence of hydrologic indicators.

### **Wetlands Classifications**

All wetlands in the Township of West Windsor are freshwater, i.e., there are no marine (open ocean and associated coastline) and no estuarine wetlands (salt and brackish marches, coastal rivers and bays). Freshwater wetlands are divided among three types of systems, namely riverene, palustrine and lacustrine systems. Riverene wetlands are those that are freshwater rivers and streams. The Township has several rivers and brooks, as discussed in the Hydrology Section above. Palustrine wetlands are those that are freshwater marches, bogs or swamps. Lacustrine wetlands are freshwater lakes, reservoirs and large ponds.

Freshwater wetlands are divided among three resource classifications, which include exceptional resource value, ordinary resource value and intermediate resource value wetlands.

- Exceptional resource value wetlands are those that discharge into FW-1 waters or FW-2 (TP) waters or their tributaries or those that are present habitats for threatened or endangered species, or those which are documented habitats for threatened or endangered species, and which remain suitable for breeding, resting, or feeding by these species during the normal period these species would use the habitat.

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- Ordinary resource value wetlands are those that are not exceptional resource value and are isolated wetlands which are more than 50 percent surrounded by development and less than 5,000 square feet in size, drainage ditches, sales or detention facilities.
- Intermediate resource value wetlands are those that are neither exceptional nor ordinary.

A copy of the NWI specific to West Windsor is available at the Municipal Building for inspection. Copies of the NWI may be purchased at the U.S. Department of Interior, Fish and Wildlife Services.

### LAND USE / LAND COVER

The NJDEP recently compared and updated its 1986 land use/land cover (LULC) with those from the 1995/1997 color infrared (CIR) imagery and delineating areas of change. Also, an impervious surface (IS) code, detailed as percentages were broken down into 5% increments, ranging from 0 to 100, was assigned to each LU/LC. The 1995/97 LU/LC update and IS mapping was developed to improve the detail and currency of State environmental data and provide data for trend analysis studies. The use of the updated 1995/97 LU/LC and IS layer in trend analysis studies will provide a means of monitoring "the health of the citizens and ecosystems of New Jersey" through the use of diverse applications.

### CULTURAL SITES

Known historical and archaeological sites in West Windsor Township, where almost 250 years of history and thousands of years of pre-history are still evident, are indicated on the following exhibit and on Table IX-1. The history and archaeology of West Windsor have remained relatively well preserved mainly because of the low density of housing and large areas of open space in the Township. The West Windsor Historical Society has recently compiled information on the many sites and buildings in the Township. The Cultural Sites exhibit illustrates the work accomplished in cataloging and evaluating the sites and structures of historical and archaeological interest.

#### Archaeological Sites

There are 19 known archaeological sites in West Windsor Township. The Stobbe site was excavated in the late 1930's by Dr. Dorothy Cross and is one of eight sites in New Jersey extensive enough to recommend further excavation and analysis. No additional work has been done on the Stobbe site. Two other sites have been excavated by the Unami Chapter of the Archaeological Society of New Jersey and by the State Museum, circa 1960. Four sites have been surveyed and evaluated as having good potential yields if excavated. Mining and weathering have destroyed two other sites.

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**TABLE IX -1**  
**HISTORICAL & ARCHEOLOGICAL SITES**

<b>MAP NUMBER</b>	<b>BLOCK &amp; LOT</b>	<b>ADDRESS</b>	<b>YEAR</b>
1	7/20	4261 Quaker Bridge Road	1820
2	7/57	4271 Quaker Bridge Road	1825
3	7/64	4275 Port Mercer Road	1825
4	7/63	4273 Port Mercer Road	1825
5	7/18	Nassau Park	*1783
6	7/17	Nassau Park	*1790
7	8/4	U.S. #1	*1800
8	8/29	3440 Brunswick Pike (Webers Kennel)	1800
9	4/1	3613 Brunswick Pike	*1870
10	9/12	North Corner Meadow Road	*1850
11	7/12	3625 Brunswick Pike	*1808
12	7/12	Brunswick Pike	*1800
13	7/10	3621 Brunswick Pike	1858
14	9/7	3600 Brunswick Pike	*1900
15	9/5	3618,3620,3622 Brunswick Pike	*1858
16	7/10	1 room school , 3637 Brunswick Pike — Penns Neck	*1917
17	9/2	3628 Brunswick Pike	*1808
18	9/1	Brunswick Pike	*1880
19	7/36	3661 Brunswick pike	*1880
20	6/39	Brunswick Pike	*1879
21	4/3	Brunswick Pike	*
22	4/4	Brunswick Pike (Corner Washington Road)	*
23	6/62	3674 Brunswick Pike	*1808
24	40/3	Brunswick Pike	*1750
25	5/4 & 5	Baptist Church * Parsonage (1797) (1812)	1797 — 1812
26	3/6	3721 Brunswick Pike	*1708
27	3/5	3723 Brunswick Pike	*1858
28	3/3	Brunswick Pike	*1785
29	5/9	Brunswick Pike	*1830
30	2/8	31 Logan Drive	1770
31	1/10	43 Lower Harrison	1708
32	3/11	48 Lower Harrison	1800
33	1/3	51 Lower Harrison	1850
34	1/ 2 & 9	65 Lower Harrison	1820
35	7/123	2 Canal Road	*1833
36	7/24	14 Canal Road	1858
37	7/ 7 & 8	12 Canal Road	1858
38	7/ 5 & 6	10 Canal Road	1900
39	6/45	124 Washington Road	1890
40	6/8	14 Washington Road	1854
41	13/11	130 Washington Road	1900
42	6/9	31 Washington Road Station Drive	1800
43	6/44	33 Washington Road Station Drive	1900
44	6/41	35 Washington Road Station Drive	1900
45	6/16	645 Alexander Road	*1918
46	9/3	Alexander Road	*1870
47	10/8	Bear Brook	*1858

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48	9/6	58 Bear Brook	*1883
49	10/9	105 Bear Brook	*1808
50	8/27	439 Meadow Road	*1858
51	8/2	Quaker Bridge	*1800
52	8/16	Quaker Bridge	*1890
53	8/12	Quaker Bridge	*
54	15/19	Quaker Bridge	*1850
55	15.14/20	4105 Quaker Bridge	
56	15.14/18	50 Clarksville Road	1870
57	15/5	Clarksville Road — Destroyed by Fire	*1925
58	10/15	201 Clarksville Road	*1850
59	10/14	219 Clarksville Road	1850
60	16/5	Clarksville Road	*1850
61	11/26	315 Clarksville Road	1800
62	11/10	325 Clarksville Road	1888
63	16/31	1 Penn Lyle Road	1800
64	17/24 & 39	Clarksville Road	*1800
65	12/5	Clarksville Road	*1800
66	12/3 & 7	429 Clarksville Road	1758
67	82/8	930 Alexander Road	1900
68	68/18	940 Alexander Road	1900
69	5/18	51 Cranbury Road	1900
70	5/50	67 Cranbury Road	1900
71	5/70	109 Cranbury Road	1900
72	12/6	148 Cranbury Road	1879
73	12/4	152 Cranbury Road	1888
74	12/33	164 Cranbury Road	1758
75	12/11	Cranbury Road, Grovers Mill	1775
76	14/10	175 Cranbury Road	1850
77	5/47	11 Millstone Road	1883
78	14/2	223 Millstone Road	1900
79	14/4	Cranbury Road	*1808
80	14/92	249 Cranbury Road	1800
81	14/9	457 Cranbury Road	1880
82	20/3	420 Cranbury Road	1900
83	21/18	304 Cranbury Road	1878
84	18/5	258 Hendrickson Drive	1862
85	18/20	224 Hendrickson Drove	1786
86	21/9	3 South Mill Road	1900
87	17/139	38 South Mill Road	1850
88	21/4	23 South Mill Road	1875
89	30/54	13 Penn Lyle	1850
90	16/04	47 Penn Lyle	1850
91	16/7	83 Penn Lyle	*1750
92	10/6	397 No. Post Road	1808
93	15/3	217 No. Post Road	1750
94	15/48	157 No. Post Road	1900
95	16/23	18 No. Post Road	1800
96	23/01	639 So. Post Road	1850
97	24/23	So. Post Road	*1800
98	23/2	So. Post Road	*1895
99	23/3	So. Post Road	*1800
100	15/45	Village Road West	*1841

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101	15/37-40	730 Village Road West	1850
102	15/68	758 Village Road West	1846
103	15/71	762 Village Road West	1825
104	15/29	774 Village Road West	1890
105	23/8	785 Village Road West	*1820
106	15/38	838 Village Road West	*1820
107	23/9	4039 Quaker Bride Road	*1818
108	23/29	Old Trenton Road	*1890
109	29/06	Old Trenton Road	*1858
110	29/5	1201 Old Trenton Road	1850
111	29/22	66 Line Road	1850
112	30/46	98 Line Road	1850
113	29/21	39 Cubberly Road	1900
114	29/7	1393 Old Trenton Road	1900
115	30/4	1627 Old Trenton Road	1850
116	25/28	Old Trenton Road	*1800
117	23/26	South Post Road	*1858
118	23/24	South Post Road – John Rogers House	1761
119	25/10	South Post Road	*1825
120	25/32	South Post Road	*1900
121	25/28 & 29	South Post Road	*1800
122	25/41	1638 Old Trenton Road	*1800
123	30/23	1629 Old Trenton Road	1758
124	30/01	Old Trenton Road	*1820
125	25/90	1672 Old Trenton Road – Edinburg 1 room school	*1900 School
126	25/83	1694 Old Trenton Road	1900
127	32/8	Old Trenton Road (Robbinsville Road)	*1870
128	25/44	1712 Old Trenton Road	1850
129	25/22	1716 Old Trenton Road	1808
130	27/13	1720-1722-1724 Old Trenton Road	1825
131	33/16	1719 Old Trenton Road	1898
132	33/15	1721 Old Trenton Road	1758
133	33/14-21	1727 Old Trenton Road	1750
134	27/10	1736 Old Trenton Road	1870
135	27/14 & 18	1337 Edinburg Road	1850
136	25/18	Edinburg Road	*1850
137	25/ 5 & 9	Edinburg Road	*1750
138	27/5&8	Edinburg Road	*1850
139	25.05/3	6 Huntley Drive	1893
140	27/14	1439 Edinburg Road	1819
141	33/34	1777 Old Trenton Road	1850
142	27.08/34	7 Finch Court	1750
143	27/2	Old Trenton Road	*1800
144	28/10	1912 Old Trenton Road	1875
145	28/9	1956 Old Trenton Road	1883
146	33/3	1953 Old Trenton Road	1870
147	28/5	1956 Old Trenton Road	1758
148	28/15	2044 Old Trenton Road	1800
149	33/22	180 South Lane	1900
150	34/11	225 South Lane	1850
151	33/24	1309 Windsor Road	1850
152	33/6	1255 Windsor Road	1858
153	33/8	1236 Windsor Road	1908

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154	34/6	1209 Windsor Road	1830
155	32/1	1202 Windsor Road	<b>1833</b>
156	32/2	1234 Windsor Road	1830
157	32/10	1250 Windsor Road	1890
158	32/4	1262 Windsor Road	1905
159	33/35	231 Village Road East	*1870
160	28/11	Village Road East	*1880
161	27/3	Village Road East	*1800
162	21/16	348 Village Road East	1875
163	21/15	Village Road East	*1875
164	21/17	282 Village Road East	*1800
165	24/1	407 Village Road East (Site of Windsor Chapel)	1888
166	21/37	408 Village Road East	1810
167	24/4	409 Village Road East	1850
168	24/5	411 Village Road East	1858
169	44/33	413 Village Road East	1900
170	21/26	414 Village Road East	1810
171	24/6	415 Village Road East	1875
172	21/27	416 Village Road East	1790
173	21/28	418 Village Road East	1900
174	21/29	420 Village Road East	1850
175	21/26	210 South Mill	1800
176	24/7.02	212 South Mill	1800
177	21/22	131 South Mill	1850
178	17/21	132 South Mill	1850
179	17/17-24	158 South Mill (D.N. Church)	1801
180	17/13	South Mill	*1838
181	17/10	South Mill	*1850
182	21/8	South Mill	*1825
183	17.17/38	508 Village Road West	1858
184	24/10	505 Village Road West (Board of Ed)	1881
185	24/11	509 Village Road West	1858
186	17/27&28	510 Village Road West	1858
187	17/17.29	514 Village Road West	1858
188	17/17.19	516 Village Road West (Dutch Neck 1 room school)	1890
189	<b>24/3</b>	Village Road West	*1800
190	17.17/132	528 Village Road West	1780
191	17.17/45	530 Village Road West	1908
192	17.17/17	542 Village Road West	1750
193	24/15	Village Road West	*1800
194	16/22	S. L. Reed - Village Road West (Moved to Hopewell)	*1800
195	16.11/73	574 Village Road West	1830
196	25/3	Conover Road	*1758
197	24.17/18.01	Conover Road	1900
198	24/16	Conover Road	*1828
199	8/11	551 Meadow Road	1740
200	16/8	North Post	*1800
201	19/11	193 Princeton Hightstown Road	1840
202	21/7-21	Princeton Hightstown Road	*1880
203	21/9	Princeton Hightstown Road	*1858
204	19/8	102 Rabbit Hill Road	1850
205	20.11/4	29 Rabbit Hill Road	1828
206	19.08/124	60 Rabbit Hill Road	1870

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207	20/21	Princeton Hightstown Road	*1900
208	22/4	350 Princeton Hightstown Road	*1750
209	20/13	Princeton Hightstown Road	*1840
210	22/3	Princeton Hightstown Road	*1883
211	22/5	Princeton Hightstown Road	*1850
212	47/6	21 McGetrick or 125 Southfield Road	1800
213	20.09/4	175 Southfield Road	1800
214	20.07/12	221 Southfield Road	1808
215	21.28/5	Southfield Road	1758
216	21.30/14	49 Southfield Road	1870
217	28.02/31	50 Southfield Road	1800
217	28.02/31	Southfield Road (Parsonage School)	1800
218	(was 11/15.01)	297 Clarksville Road	
219	19/34	10 North Mill West Windsor Community Park	*1803
220	20/42	474 Cranbury Road	1850
221	10/21	377 North Post Road	1918

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Two sites may encompass additional sites within their area.

These 19 known sites are not a comprehensive listing of archaeological sites in West Windsor. A major Indian trail, the Assunpink Trail, ran just north of the Township, with secondary trails running north-south through the Township along the creeks and Millstone River. Although there is no evidence of a major Indian settlement in West Windsor, many temporary camps were probably made during hunting and fishing activities. It is essential, therefore, that in addition to preserving the most promising known sites for excavation, care should be taken in any below-ground construction to avoid inadvertently destroying some new archaeological site. If evidence of prehistoric occupation is found, the New Jersey State Museum should be notified immediately.

### Historical Sites

#### A. Penns Neck Cemetery (#25)

The cemetery is on a knoll off of Washington Road. It is the oldest burial ground in the Township and the original cemetery of the Schenck/Covenhaven family. The cemetery contains 30 to 40 graves, dating from 1752 to 1941. Some of the earliest gravestones, made of slate, are excellently preserved. The Schenck/Covenhaven cemetery is almost in its original setting because the surrounding land has been used for agriculture. Changes in the land use patterns around this site may negate its presently well-preserved historical integrity.

#### B. Penns Neck Baptist Church (#24)

This white frame church is on the south side of U.S. Route 1, east of Washington Road. It was built in 1812 and is the first church constructed in Penns Neck. The cemetery behind the church contains about 60 graves, some dating from the early 1800s. Penns Neck Baptist Church is on State and National Register of Historic Places.

#### C. The Red Lion Inn – Penns Neck Baptist Church Parsonage (#25)

Located behind the Baptist Church on Washington Road, this frame structure is now the Baptist parsonage. The Red Lion Inn was constructed in 1807 or 1808 by William Conover and served both stage travelers along the Trenton-New Brunswick Turnpike and boatmen from the Delaware and Raritan Canal. The inn was one of two taverns in Penns Neck and was the center of much community life in the nineteenth century. Although the function of the structure has been altered, the external architecture of the present parsonage preserves the identity of its former use.

The historical setting of the Baptist Church and parsonage in Penns Neck has been disturbed because of their proximity to the busy intersection of two heavily traveled roads. The church and former inn are in very good condition, although they are all but lost in the intensity of activity around them.

#### D. Grover's Mill

The settlement at Grover's Mill predates the Revolution. It is the site of the earliest grist mill in the Township, which still stands at the outlet from the pond. The mill works are in poor condition, but the original square-hewn timbers and parts of the millworks are still visible inside the mill, which is now a private residence. Some of the older farmhouses and homes near the mill are in excellent condition. The mill was a favorite place of President Grover Cleveland and was frequently visited by Woodrow Wilson, as both presidents were personal

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friends of the mill's owner, Walter Grover.

The intersection at Grover's Mill has not yet been congested by traffic or surrounded by new construction, but residential growth around the mill pond and near the mill could destroy a setting that still holds strong historical associations.

E. Edinburg Hotel – Edinburg (#131)

This hotel at the center of Edinburg was built in 1895-1896 to replace the original Edinburg Hotel, which was destroyed by fire in 1895, at a site approximately 300 yards from the location of the present hotel. The original hotel predated the Revolution and was on the main coach route to New York City in the eighteenth century. The store across the street occupies one of the oldest buildings in the community and has been in continuous use since the late eighteenth century. The community was once known for its hat and basket factories.

F. Widow Bergen's Tavern – Dutch Neck (#1751)

The former tavern has been a private home since 1883 when it was converted from a tavern under pressure from a local temperance group. The structure has been moved twice but is still in excellent condition. No close estimate of its age is available, but the tavern was mentioned in a publication of 1805 and possibly once housed Revolutionary troops. The structure is now on South Mill Road, a dead end street just south of the center of Dutch Neck.

G. Dutch Neck Presbyterian Church (#179)

The present church was organized in 1816 and had 25 members. The central part of the church was built in the late eighteenth century as the Neck Meeting House. Later additions to the church have covered some of the earliest graves, but the cemetery still contains graves from before the Revolution, with the names of many of West Windsor's oldest families still legible on the gravestones.

H. The Chapel – Dutch Neck (#184)

The Presbyterian Chapel, now Board of Education building, was constructed in 1880 and is the small frame building on Village Road just west of the old Town Hall. It was a Mercer County branch library from 1966 to 1983. The historical integrity of the village of Dutch Neck has been preserved by the slow growth of population in the Dutch Neck area and by the relationship between the village center and buildings such as Widow Bergen's Tavern, the Presbyterian Church, the Chapel, the general store and post office. Residential development around the village may threaten the historical integrity of the village center by changing the setting, and by increasing the traffic volume and service demands of the area.

I. Route of Washington's March to Princeton

A stone monument on Quaker Bridge Road marks the route of Revolutionary troops from Trenton in January 1777. Quaker Bridge Road marks the orientation of the Keith Line surveyed in 1687 to clarify the boundary between the colonies of East and West Jersey, and also delineates part of the western boundary of Mercer County.

J. Port Mercer (#1.2.3.4)

The village of Port Mercer was one of 12 stops on the famous Delaware and Raritan Canal, which opened in 1834. The home of the canal bridge tender and his family on the southern bank of the canal is still inhabited and in excellent condition. Graves of some of the Irish

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immigrant laborers who died in a cholera epidemic in 1832 during construction of the canal are reported to be nearby. Today the settlement retains much of its nineteenth century atmosphere.

### K. Delaware and Raritan Canal

Opened in 1834, The canal soon became the major inland freight route between Philadelphia and New York. When the Pennsylvania Railroad began hauling freight more economically than mule boats, the canal became a major recreational waterway. During the 1880s and 1890s, private yachts traveled the route, and P.T. Barnum's Circus once came to town via the canal. Today, the canal is the main source of water for much of Central Jersey, as well as a state park for the enjoyment of picnicking, jogging, fishing, and canoeing.

### L. John Rogers House (#118)

This former residence is located in Mercer County Park, was constructed in 1761, and is on National Registry of Historical Places.

### M. Old Trenton Road Farmhouse (#142)

This residence was built in 1750 and is the oldest existing farmhouse in the Town-ship. It is now part of a development with an address as 7 Finch Court.

### N. Hey General Store (#421)

Built in 1800, this property is located along the Penn Central railroad line in the oldest section of Princeton Junction. Formerly a general store, it is now occupied by a restaurant

### O. Princeton Junction Schoolhouse (Parsonage School) (#217)

Built in 1800, this private residence was once a one-room schoolhouse serving Princeton Junction. It has been relocated to 50 Southfield Road at the Schenck Farmstead.

### P. Dutch Neck Schoolhouse (#188)

Built in 1890, this structure was a one-room schoolhouse for Dutch Neck. In 1917, the structure was converted into a private residence and garage.

### Q. Berrien City

Berrien City was the first planned development in West Windsor. It was built during the 1920s.

### R. Princeton Basin (#35, 36, 37, 38)

Princeton Basin became a station on the Camden and Amboy Railroad, which was constructed parallel to the canal from Trenton to Kingston in the late 1830s. The Railroad Inn was demolished and the tracks were removed when the Pennsylvania Railroad bought the C & A in the 1860s.

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### WASTE MANAGEMENT / RECYCLING

#### Trash

The Township of West Windsor contracts for the removal of solid waste (trash & garbage) for all residential properties with a private company. More detailed information concerning specific requirements and schedules of the present contractor are available at the municipal offices.

Significant businesses typically contract for the recycling and disposal of solid waste with private companies separate from the Township system. All business properties are required to address the anticipated production of solid waste and provide a plan and area for the storage and disposal of these materials as part of the site plan review process at the Township Planning or Zoning Board.

#### Recycling

The Mercer County Improvement Authority (MCIA) handles the majority of recycling in West Windsor Township. Materials that are recycled include:

- Glass – food & beverage jars/bottles (clear, green, brown)
- Aluminum & Metal Cans – food & beverage
- Decorative Steel Cans – cookie tins
- Plastic – milk, water, bleach, fabric softener, detergent & shampoo bottles marked with a "2", and soda bottles marked with a "1"
- Paper Cartons – milk & juice
- Paper - newspapers, magazines, telephone books, catalogues, junk mail, dry food boxes, paper bags, and detergent boxes
- Cardboard - corrugated cardboard

These recyclable materials are picked-up at residential curbs, usually on every other Saturday morning.

The MCIA also recycles and/or disposes of Hazardous Waste for West Windsor Township residents. The following materials are handled by MCIA:

- Batteries - car batteries, household batteries
- Motor Oil - used motor oil
- Tires - used tires not on rims -
- Hazardous Waste - household cleaners, pesticides, weed killers, oil based paints, pool chemicals

Frequently, the MCIA holds a household chemical clean-up weekend at the fire training station in Lawrence Township. At these events, Township citizens can drop off residential hazardous wastes. Also, with respect to used motor oil, there are several auto-related businesses in the area that will accept used motor oil.

#### Composting

The Township of West Windsor contracts the operation of a compost station with a private company. The compost station is located on Alexander Road adjacent to and west of the railroad tracks. Residents may leave organic materials at the curb for pick up by the Department of Public

## SECTION IX - CONSERVATION PLAN ELEMENT

Works or take materials directly to the compost station. The Department of Public Works also picks up leaves piled at the curb in the fall. Residents may obtain (self serve) mulch or wood chips when available at the compost station. More de-tailed information concerning the recycling and disposal of compost materials is available at the municipal offices.

### **Wastewater Disposal**

Wastewater generated within the Township is either conveyed through the sewer collection system to a wastewater treatment plant for treatment and final disposal or it is treated and released on site via a septic system. The management of such wastes is planned under the Mercer County Water Quality Management Plan. The reader is directed to contact the Township or the NJDEP's Division of Watershed Management for information on the most recently adopted wastewater management plan. Most of the wastewater is conveyed to and treated at the Stony Brook Regional Sewerage Authority, River Road Facility. There is an area in the Township, however, that is serviced by the Hamilton Township Water Pollution Control Plant. That area includes the Mercer County Park within the Township on the south side of the Assumpink Creek.

There are also areas within the Township that are served by individual septic tanks. The location, design, construction, operation and maintenance of these on-site disposal systems is regulated by the Board of Health and by the NJDEP. However, there have been cases of septic systems failing. Improper maintenance and operation could cause release of pollution to groundwater and/or surface water. The Environmental Commission wants to take a proactive position with respect to septic systems, namely reduce the chances of failure in the first place, instead of the Township being in the reactive state. Therefore, owners of individual septic tanks are encouraged to contact the NJDEP's Division of Water Quality to obtain the manual that suggests proper operation and maintenance of such systems. If, in the future, septic systems continue to fail, the Environmental Commission may propose ordinances that require certain preventative actions on the part of the septic system owners.

### **Noise Factors**

Noise is considered by both the State of New Jersey and the Township of West Windsor as any sound that exceeds the provisions outlined in both the State Noise Control Standards and the Township's Noise Ordinance. Noise standards in both the state and local noise ordinances limit noise levels measured on residential properties to 65 decibels (dBA) between the hours of 7:00am and 10:00pm and 50 dBA between the hours of 10:00 pm and 7:00 am. Noise levels measured at commercial facilities, public service facilities, non-residential properties and community service facilities cannot exceed 65 dBA 24 hours a day. In addition, impulse noise levels, or those noises with duration of less than one second, are limited to 80 dBA.

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In order to understand what noises are regulated, it is important to have an understanding of decibel levels created by certain sounds. Noise is measured in decibels using approved sound level meters set at the A weighting, a level which mimics human hearing characteristics. The state noise control statutes require that all noise meters be calibrated on a yearly basis. The following table is a list of common activities and their associated noise level readings taken at given distances:

<u>Sound Source</u>	<u>Decibel Level (dBA)</u>
Moving Truck at 50'	78 – 90
Vacuum Cleaner in home	60 – 85
Air Conditioner in home	60 – 73
Operating a Lawnmower	80 – 95
Refrigerator in home	45 – 66

Areas within the township that are sensitive to elevated noise levels include all residential areas, parks and recreational fields and schools. These areas are protected from elevated noise levels by both state and local noise regulations. Sources of noise that may impact the sensitive areas within the township include railroads, traffic corridors, and industrial operations. Proper zoning within the township can reduce most noise impacts by maintaining separation between sensitive areas and the sources of noise. In addition, proposed development within the township should be evaluated for noise related impacts to the surrounding environment and mitigating measures should be imposed if impacts may occur.

### REGIONAL RELATIONSHIPS

As stated previously, the Township of West Windsor is located in Mercer County, New Jersey. Therefore, environmental information and issues from these county and state governmental entities could profoundly influence those on the more local level. Also, a portion of West Windsor is within the authority of the Delaware and Raritan Canal Commission, which has developed a resource inventory of the Canal Park.

### State Development and Redevelopment Plan

The State Planning Act established the State Planning Commission (SPC) and requires it to develop a State Development and Redevelopment Plan (the State Plan) with the assistance of the Office of State Planning (OSP). The first State Plan was adopted in June 1992. The State Plan reflects a consensus about how New Jersey residents can best manage new development to preserve our natural resources and protect our economic vitality. The State Planning Act also requires SPC to reexamine the State Plan periodically, similar to the Municipal Land Use Law, to determine if it should be revised and updated. The greatest use of the State Plan is as a mechanism for coordinating the plans and programs of each level of government, and for providing a measure of predictability to local governments and private development interests. The

## **SECTION IX - CONSERVATION PLAN ELEMENT**

Master Plan of the Township of West Windsor addresses the relationship between Township planning and the State Plan.

If the Township is to use the State Plan to its fullest benefits, issues like (1) conservation of the State's natural resources and systems; (2) protection of the environment; (3) prevention and clean up of pollution and (4) preservation and enhancement of areas with historic, cultural, scenic, open space and recreational value are examples of issues that must be considered in the Township's Master Plan and how the ERI is applied.

### **County Master Plan**

At this time, there is no Mercer County Environmental Resource Inventory. Therefore, there is none discussed here. Currently, there are discussions in the State's Legislative Branch to allow for the establishment of County Environmental Commissions. Therefore, if an ERI is developed on a countywide basis, this Conservation Plan Element and Township ERI will be reexamined to determine consistency with the larger scale ERI.

### **Delaware and Raritan Canal Commission**

Pursuant to the Delaware and Raritan Canal State Park Law of 1974, N.J.S.A. 13:13A-1 et seq., the Delaware and Raritan Canal Commission was created to prepare and adopt a Master Plan for the physical development of the Delaware and Raritan Canal State Park and to establish zones in which it will review projects that impact on the Park. For the Township of West Windsor, Zone A consists of those areas within the Township that are within 1,000 feet on either side of the canal. Zone B is those areas within the Township that are within the watershed of the Canal, namely the Stony Brook Watershed (HUC 02030105090) and the Millstone River Watershed (above Carnegie Lake) (HUC 02030105100). Projects within these areas of the Township are subject to review by the Delaware and Raritan Canal Commission as to how the governmental or private project will impact (1) storm drainage and water quality; (2) visual and natural quality impact, including historic impact; (3) stream corridor impact and (4) traffic impact. For detailed information on the Delaware and Raritan Canal Commission, the reader is directed to N.J.A.C. 7:45, Subchapters 1 through 9.

### **Watershed Planning and Associations**

Watershed management is defined as the process of managing all of the water and water-related resources within the entire area of a watershed, instead of on a site-specific basis. A watershed is defined as the geographic area within which water, sediments and dissolved materials drain to a particular receiving surface water body. NJDEP is working in 20 watershed areas of the state to devise watershed management plans to improve water quality on streams, river and lakes. Part of that process is to solicit broad public participation to insure support for the plan's implementation. Generally, public participation includes involved residents, business representatives, nonprofit organizations, public officials and environmental commissions. Currently, three nonprofit organizations involved in West Windsor and involved in the watershed process are the NJ Water Supply Authority ([www.raritanbasin.org](http://www.raritanbasin.org) or 732/356-9344), the Stony Brook-Millstone Watershed Association ([www.thewatershed.org](http://www.thewatershed.org) or 609/737-3735), and the Assunpink Creek Watershed Association.

The West Windsor Environmental Commission has begun to participate in the watershed process in order to insure the effectiveness of the watershed management plan within the political boundary of the Township. NJDEP's watershed web page has more information on the watershed

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planning activity at [www.state.nj.us/dep/watershedmgt](http://www.state.nj.us/dep/watershedmgt).

### OTHER CONSERVATION/ ENVIRONMENTAL ISSUES

#### Superfund(NPL)

In response to the possible dangers of uncontrolled and abandoned contaminated sites throughout the United States, Congress, in 1980, enacted the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as the Superfund. In 1986, CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA). Both CERCLA and SARA require that a National Priorities List of sites be maintained and revised annually for sites throughout the United States. The NJDEP maintains the New Jersey Superfund Sites on the NPL. As of October 22, 1999, the list of Superfund sites in New Jersey includes 113 final sites, 1 site proposed for inclusion and 16 sites deleted. There are no sites in the Township of West Windsor, nor in Mercer County.

#### Known Contaminated Sites (KCS)

Known Contaminated Sites (KCS) are sites that have or had contamination present at levels greater than the applicable cleanup criteria for soil, ground water standards and/or maximum contamination levels (MCL) of the safe drinking water standards. In September 1997, the NJDEP published its fourth edition of a report known as the "KCS-NJ Summer 1997 Report". The report lists sites in the state where contamination of soil and ground water is confirmed. These include sites where remediation is either currently in progress or has yet to be initiated. Table IX-2, below, is an abridged copy of the report, taken from the NJDEP's Webpage [www.state.nj.us/dep/srp/kcs-nj](http://www.state.nj.us/dep/srp/kcs-nj). **Section A** lists those sites with on-site source(s) of contamination. A site is a specific physical location, whose boundaries are based on the geographic extent of the contamination. There are 24 such sites in West Windsor. **Section B** lists those sites with unknown source(s) of contamination. A site has been identified as where contamination is located, but the named location is not the apparent source. There is one site in West Windsor of this nature. **Section C** lists those sites that have been granted No Further Action (NFA) designation for a particular case, which is an administrative designation based on the regulatory authority under which a contaminated site or area of concern is being addressed. There are six such sites in West Windsor. The September 1997 edition is the latest version available to the public. However, the fifth edition is expected to be printed in the near future.

See Table IX-2 on the following pages.

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**TABLE IX-2  
NJDEP Site Remediation Program - KCS**

SECTION A. Site with on-site source(s) of contamination

Facility Name	Address	ID Number	Status/Date	NJDEP Contract	Case No.
420 CLARKSVILLE RD	420 CLARKSVILLE RD	NJL800302267	ACTIVE 07/11/1997	BFO-S	970418170310
94 BEAR BROOK ROAD	94 BEAR BROOK ROAD	NJL000064386	ACTIVE 05/10/1993	BFO-S	9305101134
A-1 LIMOUSINE INCORPORATED (FORMER)	3493 RTE 1	NJL600166979	ACTIVE 11/01/1990	BUST	0263991
AMERICAN CYANAMID AGRICULTURAL RESEARCH	QUAKER BRIDGE RD	NJD002349009	ACTIVE	BFCM	NJD002349009
CLARK GRAFICOLOR CORPORATION	3684 RTE 1	NJD098151798	ACTIVE 01/06/1992	BEECRA	E91529
DAVID SARNOFF RESEARCH CENTER RCA	201 WASHINGTON RD	NJD009305772	PENDING	BFO-S	9502108
DINKY WOODS	3694 BRUNSWICK PKE	NJL800260036	ACTIVE 01/28/1997	BFO-S	960823100939
EXXON SERVICE STATION WEST WINDSOR TWP	3713 BRUNSWICK PIKE & PENNS NECK	NJL600055149	ACTIVE 11/16/1987	BUST	0086961
EXXON SERVICE STATION	78 RTE 1	NJD986608628	ACTIVE 09/23/1994	BUST	9409146
GETTY SERVICE STATION	39 HIGHSTOWN RD	NJL600068324	ACTIVE 11/19/1993	BUST	0109037
GULF SERVICE	3717 RTE 1	NJL000047191	ACTIVE 08/08/1997	BUST	0067377
KAL PARTNERS LP ROSZEL ROAD ASSOCIATES	13 ROSZEL RD	NJL600135032	ACTIVE 10/26/1990	BUST	0208866
MILLSTONE & NEW GROVERS MILL RDS	MILLSTONE & NEW GROVERS MILL RDS	NJD980770234	ACTIVE 06/19/1992	BSCM	NJD980770234
NJDOT PENNS NECK CIRCLE PROJECT	RTE 1 SECTIONS 25 & 35	NJL800275778	ACTIVE 12/06/1996	BFO-S	961206023913S
PRINCETON BMW	3466 RTE 1 N	NJL800262479	ACTIVE 02/28/1997	BUST	0315551
PRINCETON INDUSTRIAL PROPERTIES	3684 RTE 1	NJD000573600	ACTIVE 11/06/1999	BSCM	NJD000573600
PRINCETON WINDSOR INDUSTRIAL PARK	45 EVERETT DR	NJD986567840	ACTIVE 03/24/1995	BUST	0147170
PRINCETON WINDSOR NEWS SERVICE	19 WASHINGTON RD	NJD986585842	ACTIVE 08/02/1990	BUST	0048107
ROUTE 1 SECTION 2S & 3J	RTE 1	NJL000073650	ACTIVE 11/27/1996	BFO-S	NJL000073650
SERVICE STATION (ABANDONED)	RTE 1 N & MEADOW RD	NJL600198022	ACTIVE 08/11/1994	BUST	0256151
SHELL SERVICE STATION WEST WINDSOR	ALEXANDER & S HIGHTSTOWN RD	NJD986594539	ACTIVE 01/13/1989	BUST	0076052
SUNOCO SERVICE STATION	3771 RTE 1 (BRUNSWICK	NJD986572675	ACTIVE 12/21/1989	BUST	0148719

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	PIKE)				
SUNOCO SERVICE STATION	54 HIGHTSTOWN PRINCETON RD	NJD000697656	ACTIVE 01/22/1993	BUST	0148791
WELLS FARGO ALARM SERVICES	29 EMMONS DR	NJL600032825	ACTIVE 07/30/1992	BUST	0050492

NJDEP publishes KCS in New Jersey once a year with distribution to New Jersey's Document Depositories and County Clerks. Below is a list of State Depositories for New Jersey where copies of the KCS-NJ Summer 1997 Report are available for reference, along with an associated Status Report, which provides summary descriptions for sites where public funds are utilized for remediation activities:

- New Jersey State Library, New Jersey Documents, P.O. Box 520, 185 West State Street, Trenton
- The College of New Jersey, Roscoe L. West Library, Hillwood Lakes, Trenton
- Trenton Free Public Library, Trenton
- Princeton University Firestone Library, Public Administration Collection, Firestone A-17-J-1, Princeton
- Rider University, Franklin F. Moore Library, 2083 Lawrenceville Road, Lawrenceville

The full KCS-NJ Summer 1997 Report and its associated Status Report are also available for reference at the Mercer County Clerk's Office. Additionally, West Windsor's Municipal Clerk receives a copy of the two reports containing information only on those sites within West Windsor. These locally based reports should be available for review by the public. Finally, the full KCS-NJ Summer 1997 Report and its associated Status Report are available directly from NJDEP.

**Industrial Site Recovery Act (ISRA) Sites**

As a result of concern that discharges of toxic chemicals dating back to early industrialization have left a legacy of contaminated industrial property, the State adopted ISRA regulations, at N.J.A.C. 7:26B. These regulations sets forth procedures by which owners and operators of "industrial establishments" investigate the environmental conditions of their facilities before they sell, close or transfer operations. Industrial establishments are those involved in the generation, manufacture, refining, transportation, treatment, storage, handling or disposal of hazardous substances or wastes. As a precondition of the sale, transfer or closure of industrial establishments, the regulations require the owner or operator of the industrial establishment to investigate the site and remediate any discharges of hazardous substances to protect the public health, safety and environment. It is goal of the NJDEP to ensure that industrial establishments have been remediated to an acceptable condition upon sale, transfer or closure without jeopardizing the time needed to finalize real estate and business transactions.

In the late 1990's, the Brownfield and Contaminated Site Remediation Act was signed, which added new provisions to New Jersey's overall environmental cleanup structure. The purpose of the Act, is to advance brownfields reuse as part of a comprehensive program for urban redevelopment.

Under New Jersey Statue governing access to public records, pursuant to N.J.S.A. 47:1A-1 et seq., NJDEP makes available for public inspection of all ISRA case files. ISRA cases are not

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currently available via the NJDEP Webpage. However, interested parties may contact the NJDEP directly for particular information on ISRA case locations.

### **Incinerators**

An incinerator is any device, apparatus, equipment, or structure using combustion or pyrolysis for destroying, reducing or salvaging any material or substance. The Township of West Windsor is the home of one such thermal destruction facility. Located at the American Cyanamid Company site, along Clarksville Road, the small scale thermal destruction facility was originally permitted (registration no. 1110001005) by the State in April, 1995. The solid waste facility is located at US. Route 1, Quaker Bridge Road and Clarksville Road, Block 8, portion of Lot 12, and has a permitted capacity of 625 tons. The incinerator can provide thermal destruction for waste types 25 (animal and food processing wastes), 27 (dry industrial) and RMW (regulated medical waste, types 1 thru 7). In 2000, American Cyanamid requested NJDEP to transfer the obligations and responsibilities of the small scale incinerator to the BASF Corporation.

### **Community Right to Know**

The federal and state Community Right to Know (CRTK) laws are similar in nature. Both include requirements for reporting chemical inventories and releases of hazardous substances into the environment. Companies that engage in certain types of business activities are required to complete and return an annual survey for each facility location. The CRTK survey is an annual inventory of environmental hazardous substances which are stored, produced or used at any place where business is conducted in the State of New Jersey. Common substances often associated with business activities may pose a hazard to human health and the environment. Therefore, inventory reporting is not just limited to businesses engaged in heavy chemical use. The information collected is available to the public and to emergency personnel at police and fire departments, as well as to supplement other regulatory programs within the state and to facilitate proper planning for emergency response.

Table IX-3 lists those businesses with West Windsor Township addresses that received a survey reporting package for reporting year 1998. Those surveys were due to the NJDEP by March 1, 1999 and were to cover environmentally hazardous substances present at the facility during 1998.

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**Table IX-3  
New Jersey CRTK Public Access System Facility List 1998**

<b>Facility Name</b>	<b>Status</b>
AMS LANDSCAPING	Non User
ASCERS OPHTHALMIC	Non User
AL'S SERVICE CENTERS INC.	No Survey Received
AL'S SERVICE CENTERS INC.	No Survey Received
AL'S SUNOCO SERVICE CENTERS INC.	No Survey Received
ALLENS LANDSCAPES INC.	Non User
AMERASIA INTERNATIONAL TECHNOLOGY INC.	Reported Above Threshold
AMERICAN CYANAMID COMPANY	Reported Above Threshold
BARNETT ASSOC INC.	No Survey Received
BELL ATLANTIC NJ INC.	Reported Above Threshold
BOULOS & MAROUN JALLO & NICOLA ELKHOURI	No Survey Received
C MONDAVI & SONS CORP.	Non User
CARNEVALE DISPOSAL COMPANY INC.	Non User
CARPET MAINTENANCE SPEC. INC.	Non User
CLEANTRONICS, INC.	Non User
CLIFTON DEVELOPMENT INC.	No Survey Received
COMMONWELATH COMMUNICATIONS INC.	No Survey Received
CORE LAB HOLDINGS INC.	No Survey Received
CRAFT NASSAU INC. DIP	No Survey Received
DATARAM CORPORATION	Reported Below Threshold
DESIGN BY PERRINE INC.	No Survey Received
DRESSLERS LAWN SERVICE INC.	No Survey Received
EDEN INSTITUTE INC.	Reported Below Threshold
ELIZABETHTOWN WATER COMPANY	Reported Below Threshold
EMR PHOTOELECTRIC/SCHLUMBERGER	Reported Above Threshold
THRESHOLD ETAK INC.	Non User
F L M GRAPHICS CORP.	Reported Below Threshold
FORMOSA PERFUMERY USA INC.	Non User
FRANCOIS GUILLEMIN	Reported Below Threshold
G & B BUSINESS	No Survey Received
G S D INTERNATIONAL ENTERPRISE INC.	No Survey Received
JSP ASSOCIATES INC.	Non User
KALUWA BEAR INC.	Reported Below Threshold
MARKS TRACKSIDE AUTO CENTER INC.	Reported Above Threshold
MASTROPIERI ENTERPRISES INC.	Reported Below Threshold
MOBIL OIL CORP #15-JHN	Reported Above Threshold
MOVA LABORATORIES INC.	Non User
NEWS EAGLE-CORP.	Non User
OBRIENS OIL POLLUTION SERVICE INC.	Non User
PD Q PRESS INC.	Reported Below Threshold
PETROLEUM ENTERPRISES INC.	Reported Above Threshold
PHYSICAL ACOUSTICS CORPORATION	Reported Below Threshold
PRINCETONIAN GRAPHICS INC.	Reported Above Threshold
PRINT IT INC.	No Survey Received
PUBLIC SERVICE & ELECTRIC & GAS CO.	Reported Below Threshold
PUBLIC SERVICE & ELECTRIC & GAS CO.	Reported Below Threshold
RESIDENTIAL COMMUNICATIONS	Non User

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ROB TINDALL	Reported Below Threshold
STANLEY R PERRINE INC.	Non User
STRAHLES PAVEMENT STRIPING & SWEEPING	Non User
SURFACE TECHNOLOGY INC.	No Survey Received
WILLIAM HALL	No Survey Received
WINDSOR GREEN DRY CLEANERS	Reported Above Threshold
WON CHANG CORP.	Reported Below Threshold
WOOD EICHLER MOTOR CO. INC.	No Survey Received

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**Reported Above Threshold:** This facility reported that they produce, store or use Environmental Hazardous Substances above the thresholds as defined in the New Jersey CRTK Regulations.

**Reported Below Threshold:** This facility reported that they produce, store or use Environmental Hazardous Substances below the thresholds as defined in the New Jersey CRTK Regulations.

**Non-User.** This facility reported that they do not produce, store or use Environmental Hazardous Substances in any quantity as defined in the New Jersey CTRK Regulations.

**No Survey Received:** No Community Right to Know survey was received as of March 1, 1999.

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In addition to the chemical inventory reporting, owners and operators of manufacturing and select non-manufacturing companies, having the equivalent of 10 or more full-time employees and manufacturing, importing, processing or otherwise using toxic chemicals listed in Section 313 of the Emergency Planning and Community Right to Know Act of 1986, in quantities that exceed specified thresholds, are required to annually report their releases of these chemical for the previous year. The 1995 Release and Pollution Prevention Report is currently available on the NJDEP's Website for downloading, in a self-extracting file.

### Underground Storage Tanks (UST)

An underground storage tank (UST) is any one or combination of tanks as set forth in N.J.A.C. 7:14B-1.4, including appurtenant pipes, lines, fixtures, and other related equipment, used to contain an accumulation of hazardous substances, the volume of which, including the volume of the appurtenant pipes, lines, fixtures and other related equipment, is 10 percent or more beneath the surface of the ground. The NJDEP maintains a list of regulated UST contamination cases, which was last updated on April 6, 2000. Additionally, NJDEP maintains a listing of registered UST facilities in the State, listed by county. Finally, the NJDEP is making available a list of USTs that are in compliance with the December 22, 1998 upgrade requirements. That list is currently updated twice monthly. Table IX-4 lists these three categories of UST.

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**TABLE IX-4  
West Windsor Underground Storage Tanks**

<b><u>Facility ID</u></b>	<b><u>Facility</u></b>
79275	G & B, PRINCETON- HIGHTSTOWN RD
101224	GROVERS MILL CO, CRANBURY RD
332967	P.J.'S SERVICE CENTER, 39 PRINCETON-HIGHTSTOWN RD
167709	PRINCETON MICROFILM CORP
76052	SHELL SERVICE STATION, HIGHTSTOWN & ALEXANDER RDS
148791	SUNOCO #0005-0260, HIGHTSTOWN-PRINCETON ROAD
332264	WASHINGTON SQUARE, 36-44 WASHINGTON RD
165233	AMERICAN CYANAMID NORTH FACILITY QUAKERBRIDGE & CLARKSVILLE RD
98616	ELIZABETHTOWN WATER COMPANY BRUNTSFIELD DR
270759	G & B WEST WINDSOR RTE 571 & SOUTFIELD RD
338826	MERCER COUNTY PARK GARAGE, 334 S POST RD
338817	MERCER COUNTY PARK WORKSHOP, OLD TRENTON RD
338772	MERCER COUNTY SKATING CTR, MERCER CO PARK, 1638 OLD TRENTON RD WEST
338808	PRINCETON COUNTRY CLUB, 1 WHEELER WAY
260633	PRINCETON POLYCHROME PRESS INC, 861 ALEXANDER ROAD
332444	PRINCETON THEOLOGICAL SEMINARY CRW APT SLOETSCHER PL
131537	WEST WINDSOR TWP MUNICIPAL BLD TOWNSHIP GARAGE

**CRITICAL ENVIRONMENTAL AREAS**

In the last decade the amount and pace of development has escalated in West Windsor Township. Concurrently, the remaining open space and undeveloped parcels have dwindled. At this point in time, the critical nature of the remaining undeveloped lands and their natural resources has taken on an even greater importance. The critically important areas in West Windsor Township were determined from a number of factors including wetlands, flood hazard areas, areas with steep slopes, low flow streams, prime aquifer recharge areas and Greenbelt. Due to the accelerated loss of prime agricultural areas over the last decade, the remaining prime farmland is now part of the critically important areas of West Windsor Township. The ease of development and financial pressures on these farmland areas has hastened their disappearance. Historical and archeological sites have also been disappearing at an alarming rate. Some of these remaining sites will be made part of an application to the New Jersey Historic Preservation Office and, if appropriate, the National Register of Historic Places. These actions may provide some protection for these significant historical sites.

In the past, development pressures did not appear to be as great as in the last decade. West Windsor Township now finds itself in a "land rush" of sorts for the few remaining parcels of undeveloped land. The Township desires open space acquisition and habitat preservation which is usually in conflict with developers' intentions. This makes environmentally sound planning and development decisions even more critical in nature. The development of any parcels that contain critically important areas will be required to resolve these important issues prior to receiving Township approvals for any type of development.

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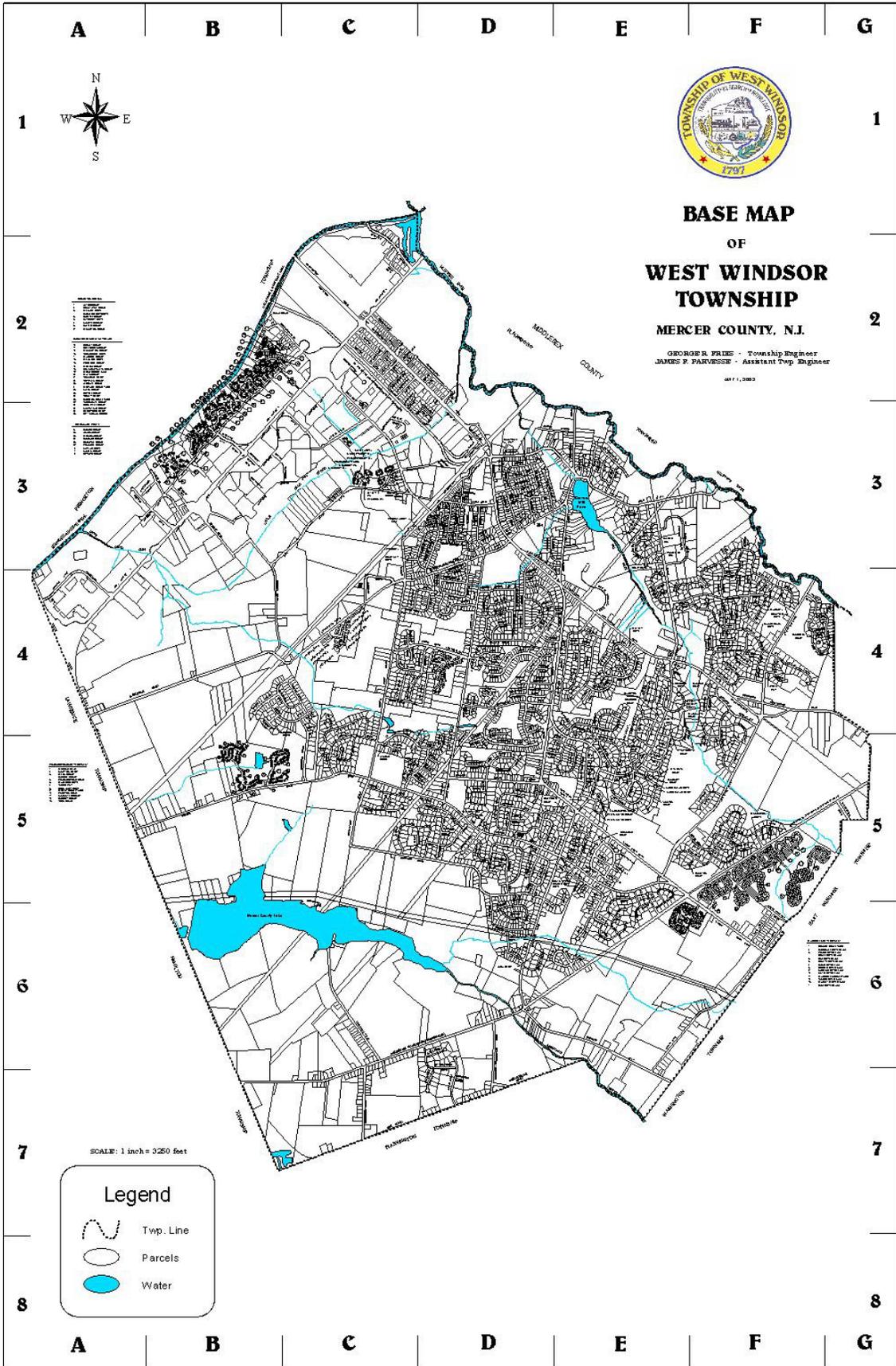
### RECOMMENDATIONS

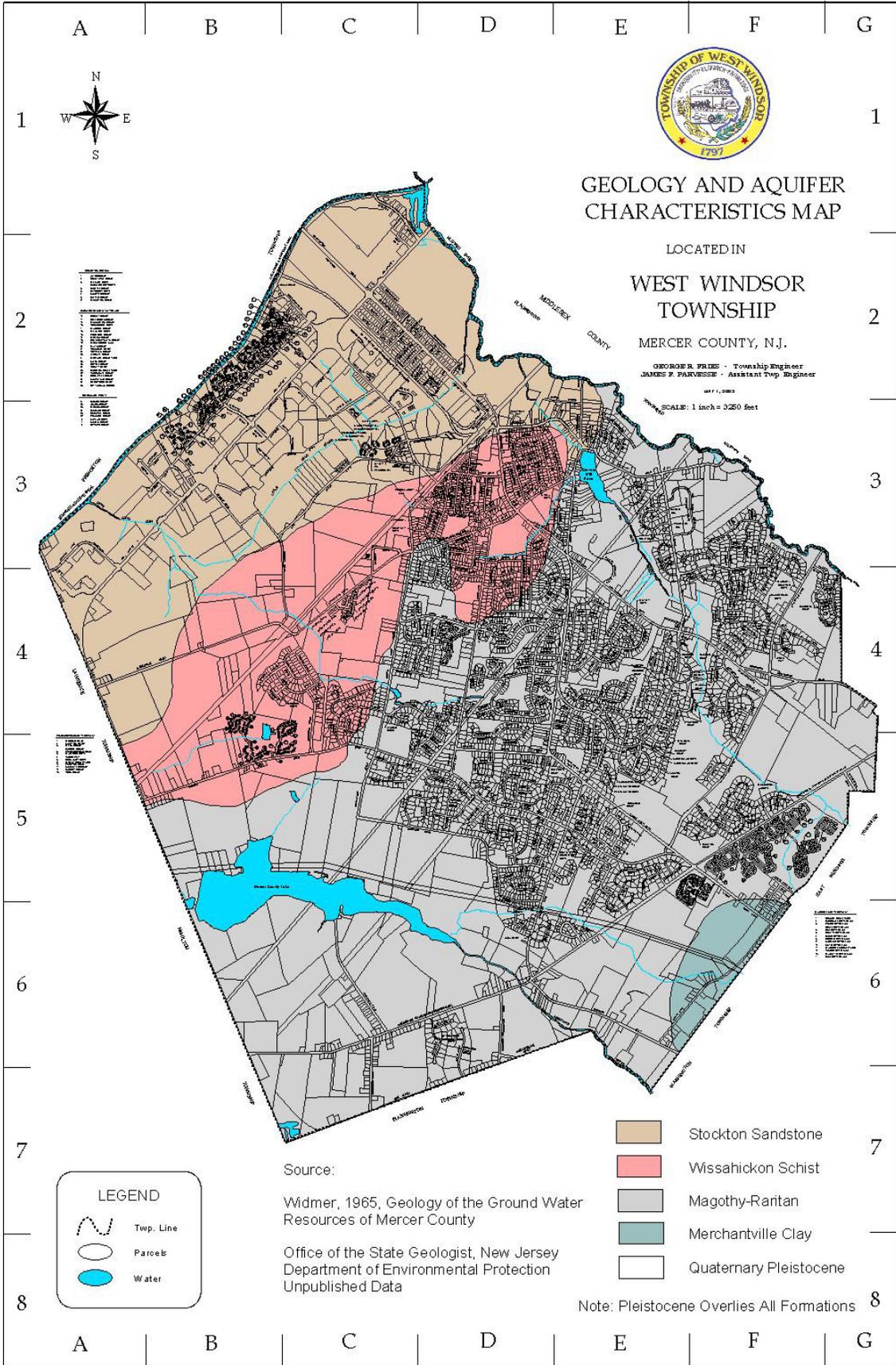
The following specific action and policies are recommended to further advance the goals of this element:

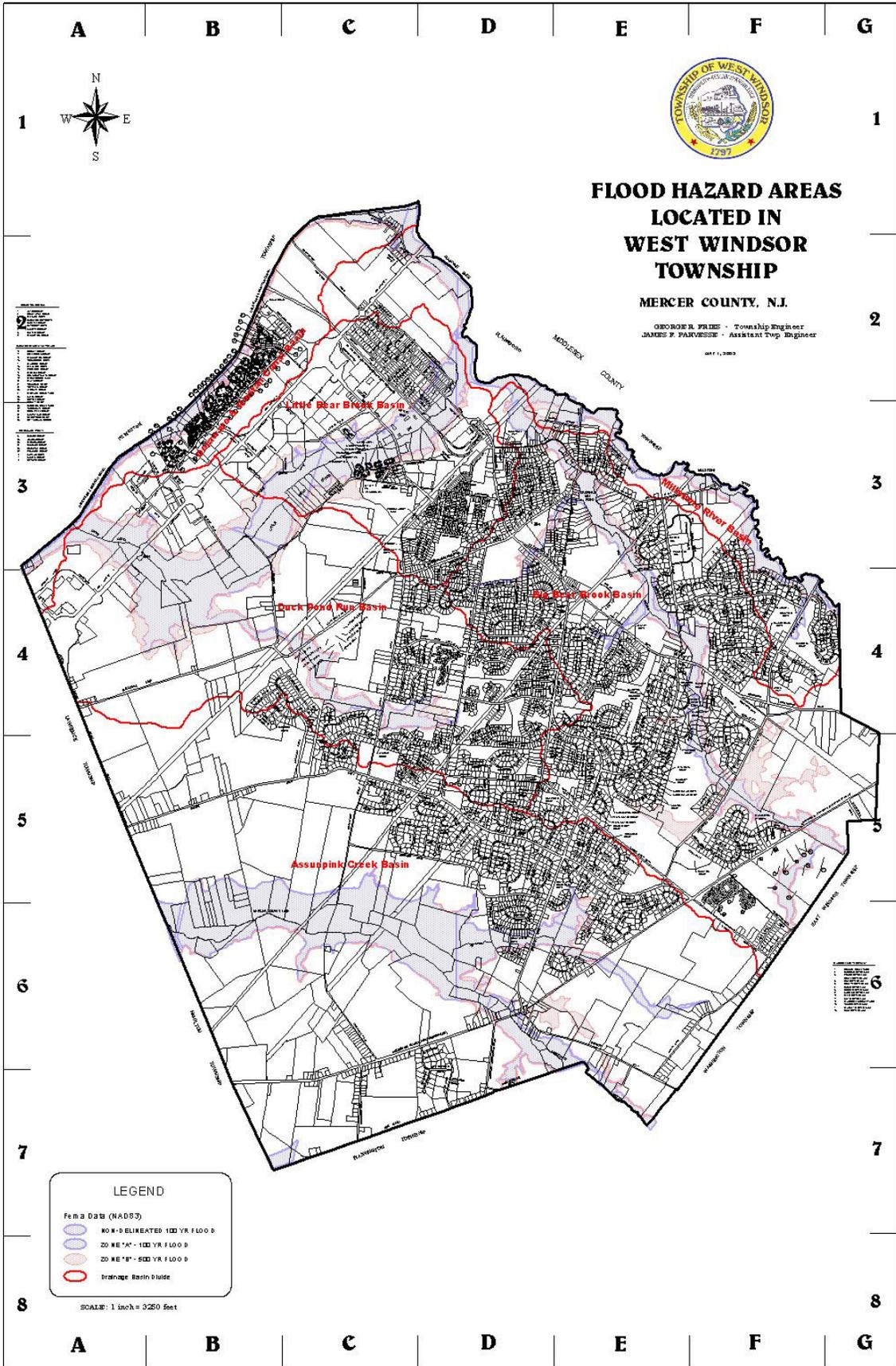
- Proactively pursue acquisition of open space within the Greenbelt or areas appropriate for park land or historic preservation utilizing the 7 cent Municipal Open Space Tax.
- Pursue State, County, Private and Non-Profit funding to augment municipal funding for open space acquisition including but not limited to: State Green Acres Program; Green Trusts; Mercer County Trust Fund Tax Acquisitions; and the State Farmland Preservation Program.
- Greenbelt lands should be depicted and reviewed with all site plan and subdivision applications to enable the municipality to conserve these lands in conjunction with prudent land development.
- Review the Greenbelt Plan relative to Township Open Space goals and amend the plan to include additional lands that are best suited to natural preservation. (Environmental Commission).
- Implement the action plan of Community Forestry Management Plan (Shade Tree Committee).
- Creative land development techniques (i.e. clustering, lot averaging, purchase or transfer of development rights, flexible implementation of setbacks and buffers) should be considered for lands that include critical environmental, historic or farm resources.
- Active participation in farmland preservation programs should be fostered to retain existing farmland and create viable farm enclaves.
- Design standards (M.I.C., maximum improvement coverage, and F.A.R. floor area ratio) should be carefully examined for zones that include lands with valuable environmental, historic, and farmland resources.
- A minimum 400' wide corridor should be preserved along all stream corridors. Acquisition of property or conservation easements should be pursued to achieve a continuous corridor (Greenbelt) along all streams.
- The design of roads, drives and parking areas should be carefully planned and examined to avoid excessive coverage, which can adversely modify the quantity, rate and quality of ground and surface water replenishment, but provide adequate circulation to avoid excessive noise and air pollution.
- Site design techniques that result in reduced impervious surface cover and stormwater runoff should be fostered. Reduced road and drive widths, and efficient parking lot design and allocation should be encouraged with all public and private development. Common driveways and shared parking should be required where possible and practical. Current ordinance standards should be reviewed to determine if decreased coverage requirements can be established.

## SECTION IX - CONSERVATION PLAN ELEMENT

- All NJDEP and DRCC stream corridor buffers should be strictly enforced in the review of development applications.
- Establish an enclave or district(s) for the preservation of farmland and farm families.
- Explore modifications of the Township Greenbelt Plan to achieve a symbiosis with State, County and adjacent Community Greenway Plans and include limited recreation activities (i.e. Limited Public Access, Nature Trails)
- Foster acquisition of open space by private donations.
- Carefully consider the impacts of recreational development relative to natural ecosystems and the sustainability of these areas.
- Design and construct all recreation development according to all required environmental regulations and practices appropriate to preserve environmentally sensitive areas and maintain or enhance environmental quality.
- Minimize the clearing of sustainable woodland and trees for recreation development by situating facilities in open areas.
- Simplify and standardize Township Greenbelt mapping and terminology.
- Promote respect and knowledge of the Greenbelt and it's importance to the community.







A B C D E F G



**FLOOD HAZARD AREAS  
LOCATED IN  
WEST WINDSOR  
TOWNSHIP**

MERCER COUNTY, N.J.

GEORGE R. WILDE - Township Engineer  
JAMES F. PARVESSE - Assistant Twp Engineer

OCT 1, 2003

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**LEGEND**

Fema Data (NAD83)

- 100 YR FLOOD
- 500 YR FLOOD
- Drainage Basin Divide

SCALE: 1 inch = 3250 feet

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