
III. NATURAL, CULTURAL AND HISTORIC RESOURCES

A. Natural Resources

Warren County has some of the most scenic and rugged terrain in New Jersey. Among its natural assets are clean water, clean air, open spaces and scenic vistas. The landscape consists of valleys underlain by limestone and ridges underlain with sandstone and shale.

Warren County has 40,000 acres of prime forestland and 61,000 acres of forestland of statewide importance. Much of this forestland is found on the County's mountain ranges including Kittatinny Mountain, Pohatcong Mountain, Jenny Jump Mountain and Scott's Mountain. A terminal moraine from the Wisconsin Glacier is located in the central part of the County. In addition to scenic mountains, the County's fertile valleys have traditionally supported a variety of agricultural activities.

The County has approximately 22,239 acres of wetlands and 5,310 acres of internal lakes and streams. All streams and rivers located in the County empty into the Delaware River, a major natural resource. Surface waters include the following waterways: Musconetong River, Pequest River, Paulinskill River, Lopatcong Creek, Pohatcong Creek, Beaver Brook, Pophandusing Creek and Buckhorn Creek. Additional surface waters located in the County are illustrated in **Figure 6** (see next page). The Delaware River has over 52 miles of county shoreline and offers activities such as fishing, swimming, boating and canoeing.

In addition, segments of the Lower Delaware River are designated as a Wild and Scenic River. The National Wild and Scenic River Program has been developed by Congress to protect the nation's premiere rivers. The Lower Delaware River was designated as a Wild and Scenic River in November 2000. The Musconetong River, as a tributary, has been added to the study area and has been recommended for inclusion into the system by eighteen of the nineteen municipalities along the Musconetong River. To date, Pohatcong Township has not gone on record in support of the designation.

Many of the natural resources are constraints to development. Critical areas for consideration in development include slopes greater than 15 percent, wetlands, floodplains and the 300 foot buffer areas for C1 waters. In addition, High Priority Conservation Areas have been identified by the Highlands Coalition for protection of drinking water supplies in the county. These environmental constraints are illustrated on **Figures 7a-d** (see pages 35-38) by section of the county.

Warren County also has conservation facilities that attract visitors as well. The Merrill Creek Environmental Resource Preserve, the Pequest Trout Hatchery and the Natural Resources Educational Center are examples of such facilities.

Figure 6
Composite Environmental Constraints

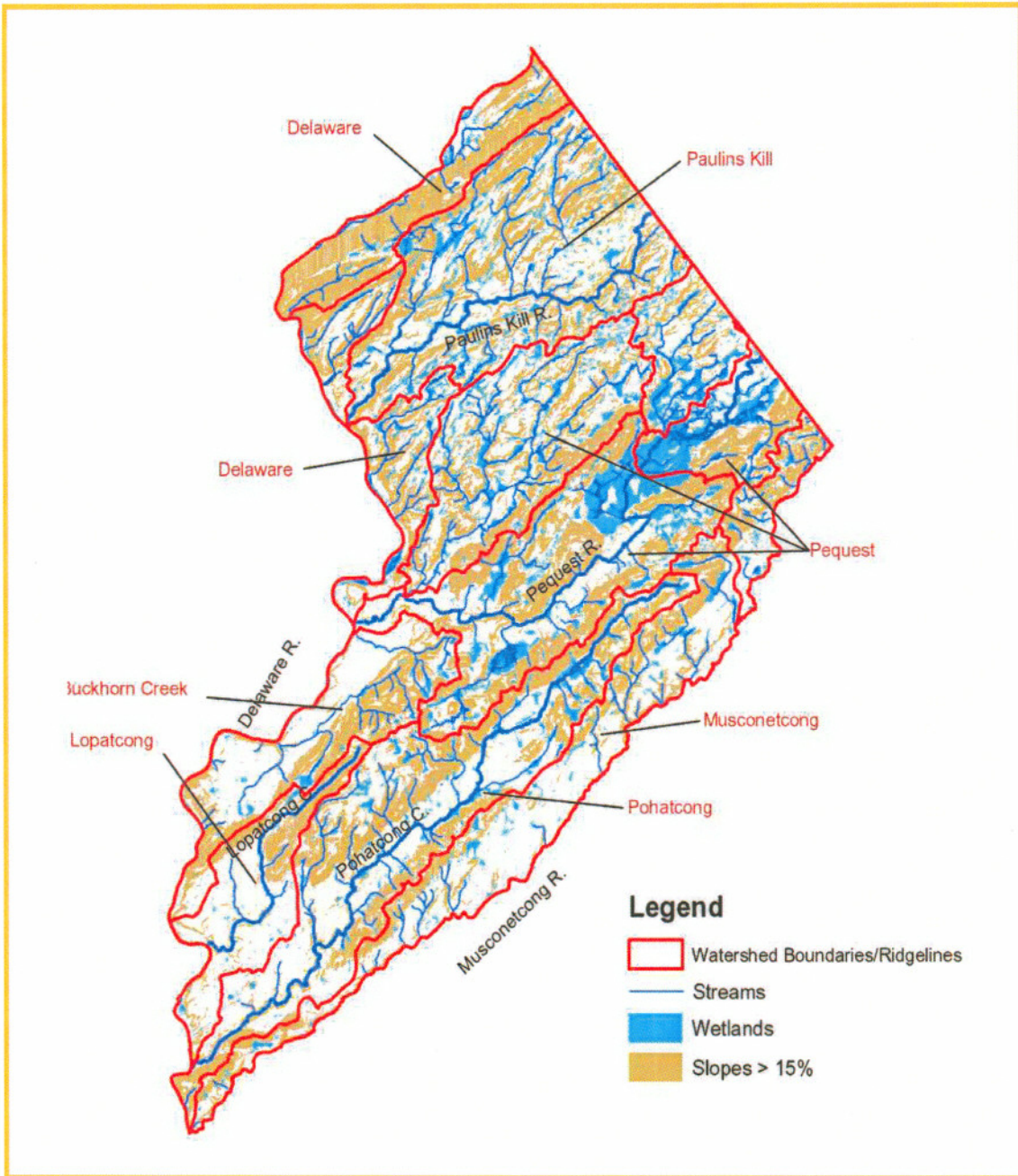
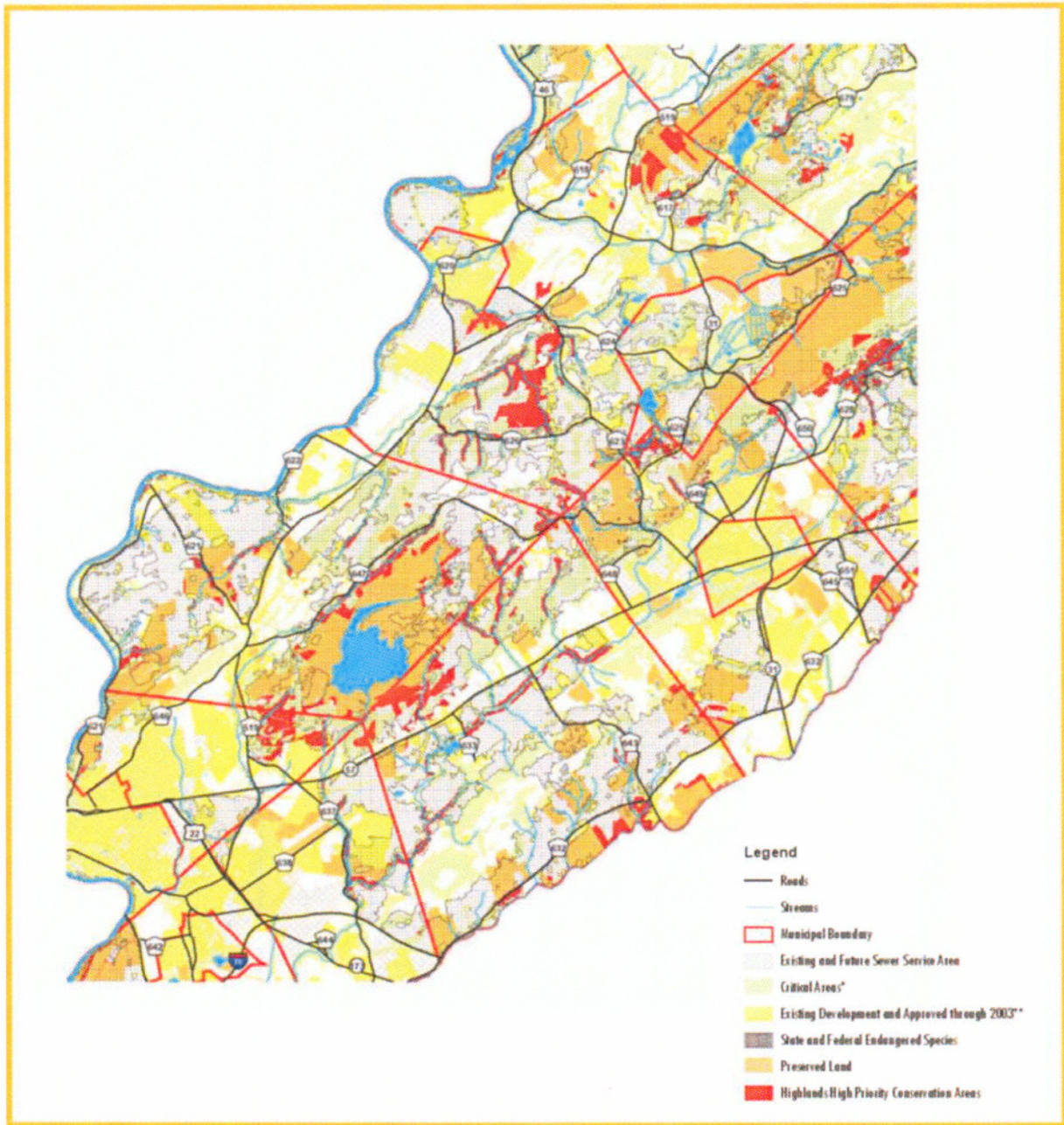


Figure 7A

Environmental Constraints Central Warren County



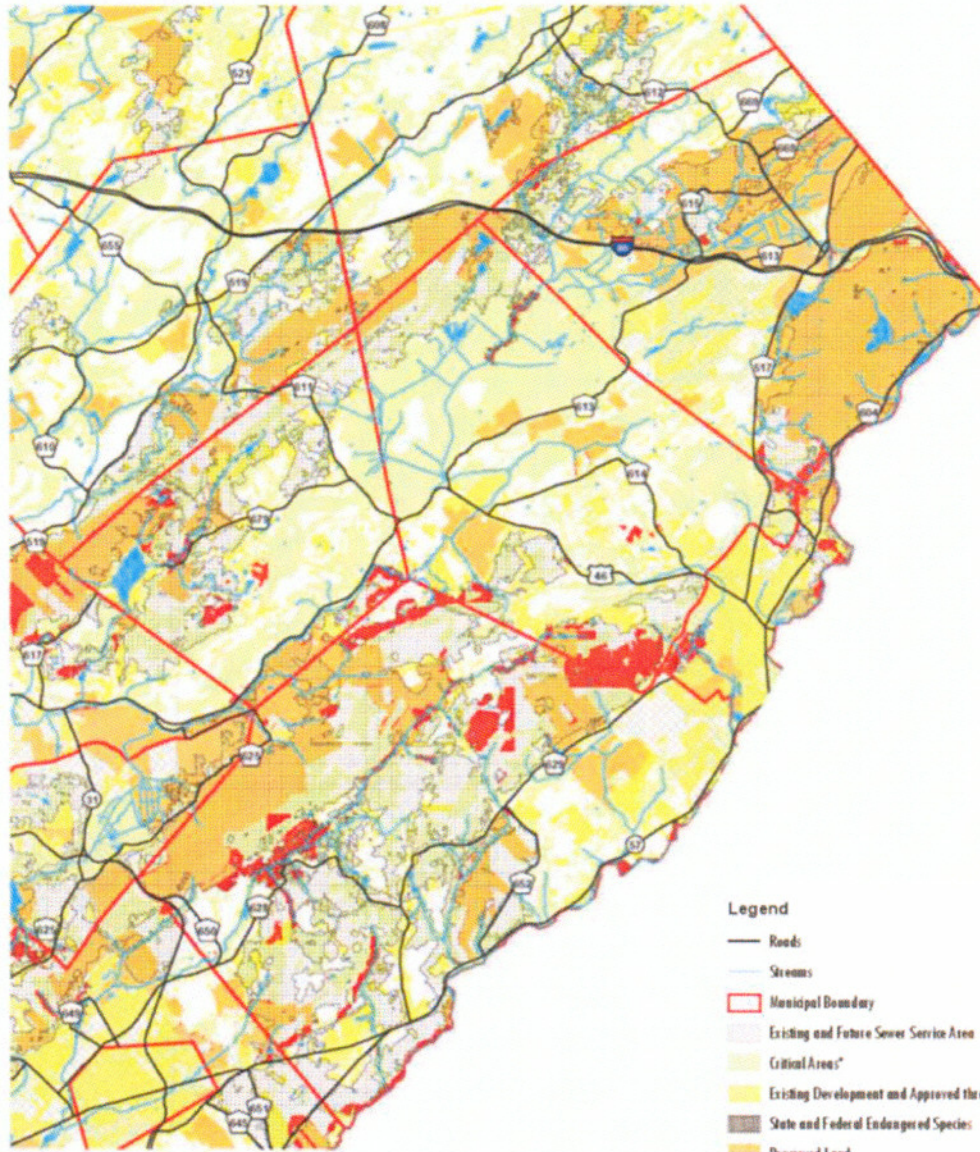
WARREN COUNTY SMART GROWTH PLAN



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Figure 7B

Environmental Constraints Eastern Warren County



- Legend**
- Roads
 - Streams
 - Municipal Boundary
 - Existing and Future Sewer Service Area
 - Critical Areas*
 - Existing Development and Approved through 2003**
 - State and Federal Endangered Species
 - Preserved Land
 - Highlands High Priority Conservation Areas

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Figure 7C

Environmental Constraints Northern Warren County

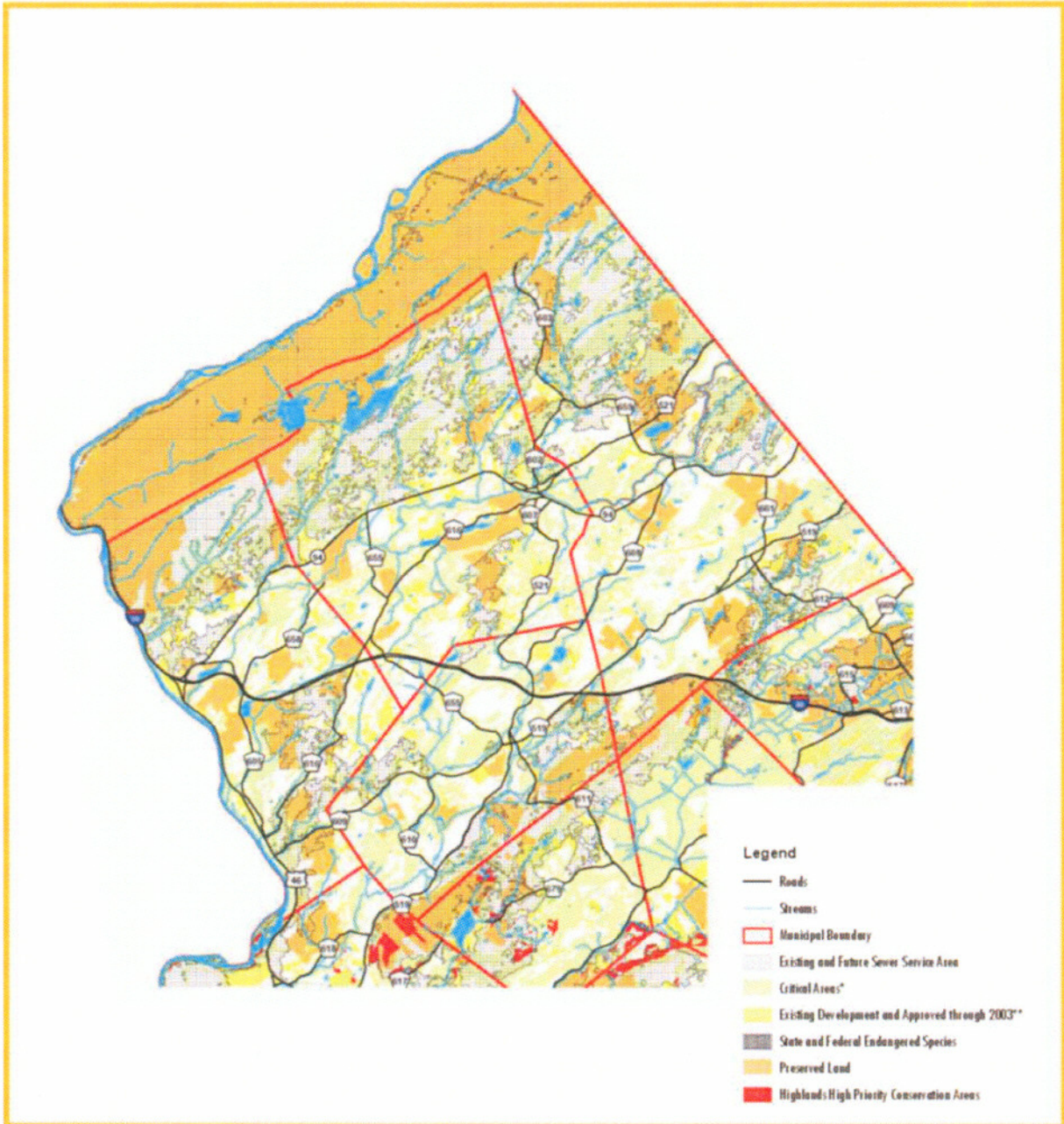
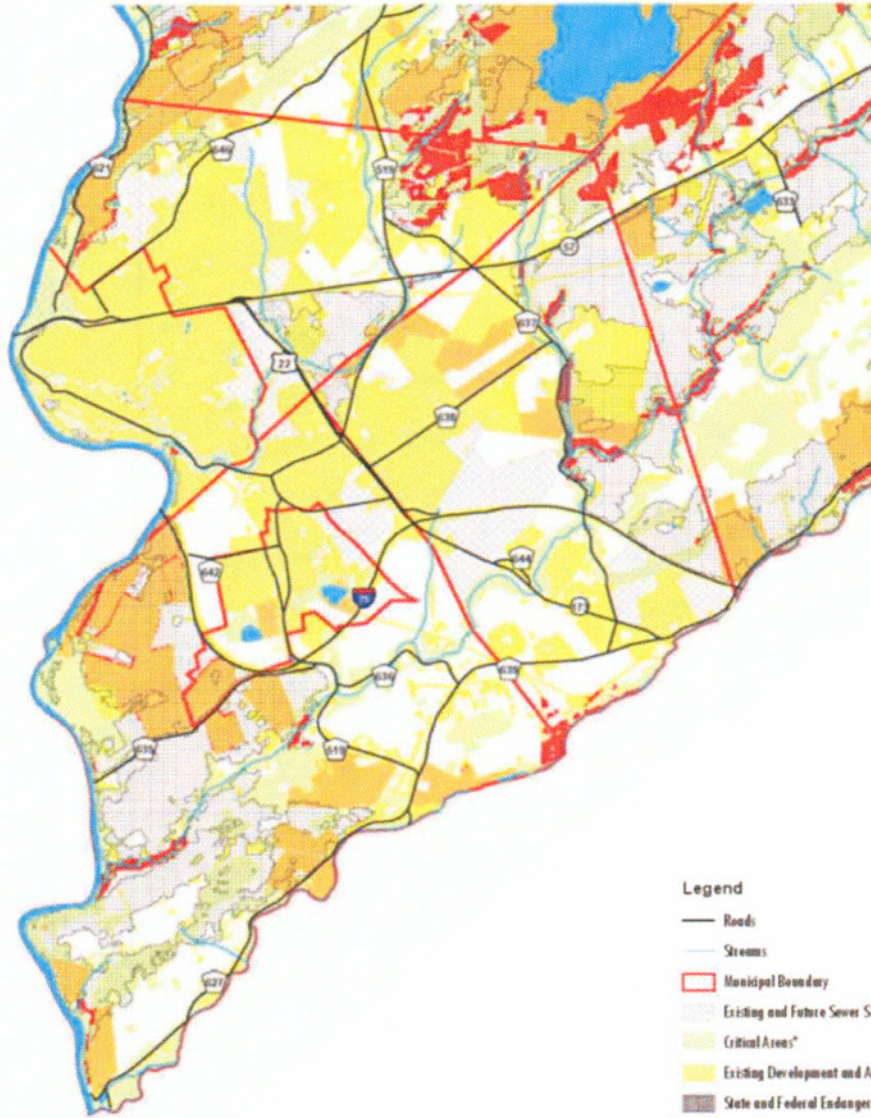


Figure 7D

Environmental Constraints Southern Warren County



- Legend**
- Roads
 - Streams
 - ▭ Municipal Boundary
 - ▭ Existing and Future Sewer Service Area
 - ▭ Critical Areas*
 - ▭ Existing Development and Approved through 2003**
 - ▭ State and Federal Endangered Species
 - ▭ Preserved Land
 - ▭ Highlands High Priority Conservation Areas

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B. OPEN SPACE

Warren County recognizes that rapid development and increasing demand for land resources provides a significant challenge in maintaining a balance of open space and recreational land. In reaction to this challenge, the county developed the *1999 Open Space Plan*. The plan identifies current open space resources as well as the open space needs. In addition, the plan offers a detailed framework through which open space preservation can occur. The development of the open space plan and goals listed in the plan are concurrent with several goals identified in the Strategic Growth Plan. The preservation of open space, cultural, environmental and historic resources as well as the promotion of intermunicipal coordination are goals identified in both documents. Existing open space is illustrated in **Figure 8** (see next page).

As of 2004, Warren County has approximately 42,474 acres of public, semi-public and non-profit open space. This figure represents approximately 18.2% of Warren County's total land area (233,312 acres). The largest portion of open space resources in the county is State Parkland. There are nearly 24,061 acres of State Parkland accounting for 57% of the total open space acreage. Federal Parkland constitutes 21% of the open space resources in the county with 9,113 acres. **Table 11** identifies the breakdown of open space resources.

TABLE 11 – WARREN COUNTY OPEN SPACE RESOURCES

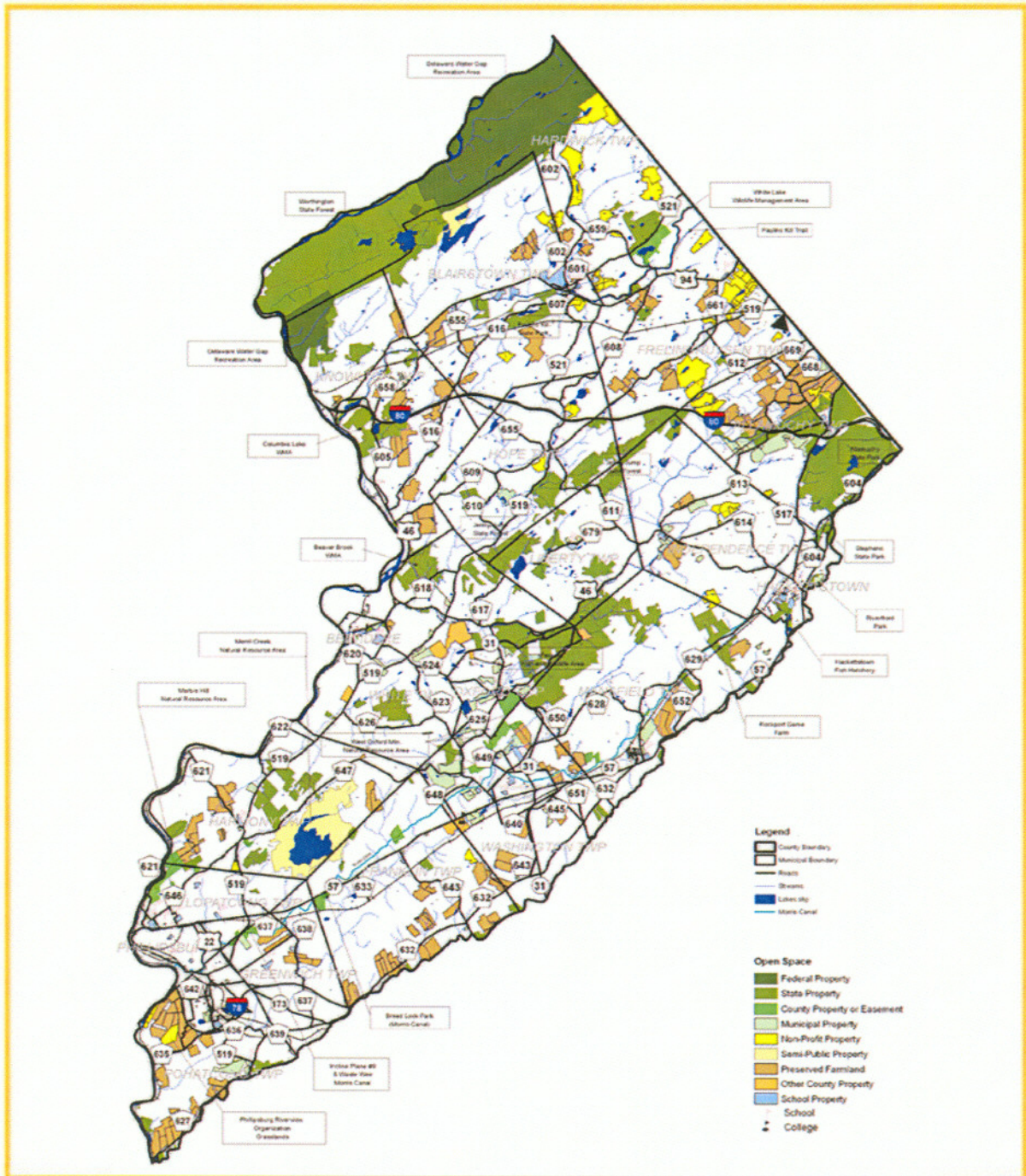
Ownership	Acres	Percent of Total Open Space
Federal Parkland	9,113	21%
State Parkland	24,061	57%
County Parkland	1,623	4%
Municipal Parkland	1,743	4%
Semi-Public Open Space	2,966	7%
Non-profit Open Space	2,966	7%
Total Acres	42,474	100%

Source: Warren County Planning Department

C. Agriculture

Warren County has a significant amount of agricultural resources. In 1997, 730 farms made up 82,900 acres in farms in Warren County. Approximately 36% of the County's total land area is in farms. Warren County ranks first among New Jersey counties for milk production and production of corn for grain. In addition, Warren County ranks second among counties for the number of cattle and calves as well as the production of lettuce. The County also produces commercial apples, sheep, lambs, soy beans, wheat, sweet corn and peaches. While agriculture was once the largest industry in the county, increased highway construction and population movement out of urban areas and into rural areas has diminished its role. The result has been significant increases of land values, decreases in product demand and a disappearance in support infrastructure.

Figure 8
Open Space



Recognizing the importance of agriculture in Warren County, the short supply of prime farmland and changing population trends the County Agricultural Development Board (CADB) developed the *Warren County Agriculture Development Board Long Range Plan* (1998). The plan views agriculture as a resource and an industry to be supported and preserved. The CADB Long Range Plan identifies farmland preservation goals. Included in these goals are acres to be preserved, criteria for farmland acquisition, municipal coordination and techniques for preservation. The overall CADB goal of preserving agricultural resources is consistent with the preservation and enhancement of agricultural resources goal identified in this Strategic Growth Plan.

The extent of agricultural soils in Warren County is shown on **Figure 9** (see next page). These include prime agricultural soils, soils of statewide importance and unique farmlands. Generally the soils are most extensive along the Delaware and Musconetcong River valleys as well as the southern portion of the county.

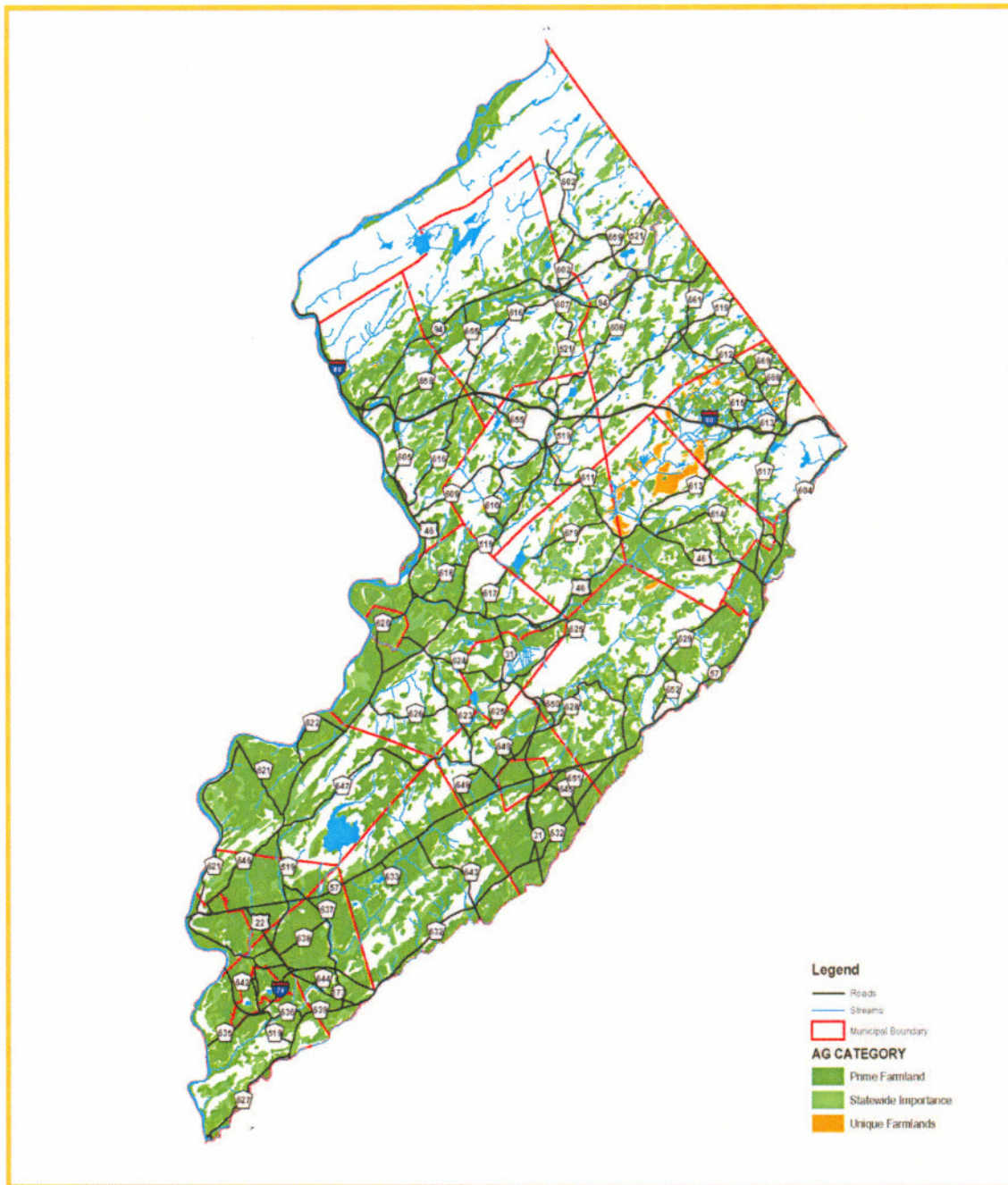
Counties throughout New Jersey have been actively preserving farms and farmland over the past several years. Warren County is no exception. There are a significant number of farms and acreage currently preserved or enrolled for future acquisition in Warren County. Over 11,044 acres including 79 farms have been permanently preserved through the purchase of development easements. Twenty farms containing a total of 2,700 acres are part of a voluntary 8-year preservation program.

D. Tourism

The County's history, culture and natural environment are resources that can assist in establishing it as a day trip tourism destination. The close proximity to New York City and northern New Jersey are additional factors that support a day trip tourism industry. Possible exceptions may include the Delaware Water Gap National Recreation Area. However, according to the Warren County *Strategic Management Plan* prepared by the Warren County Department of Economic Development and Tourism, there is little support for large-scale tourism, which might include hotels and overnight tourism. The enhancement of existing resources such as fishing, canoeing, bicycling, camping and hiking is recommended. In addition, the plan suggests channeling support for tourism related activities through a single entity such as a Visitor and Convention Bureau (VCB). This entity could focus on enhancing the current tourism industry and developing new opportunities.

Warren County's *Strategic Management Plan* concluded that tourism has little potential of generating family wage jobs and increasing the county's ratables. A recent analysis of the New Jersey State tourism industry determined that in Warren County, tourism accounts for approximately 5,000 jobs and has a total payroll of \$84,800,000. This total payroll figure represents an average of \$16,960 per job. The majority of tourist dollars spent are spent in restaurants and retail businesses

Figure 9
Agricultural Soils



E. Historic Resources

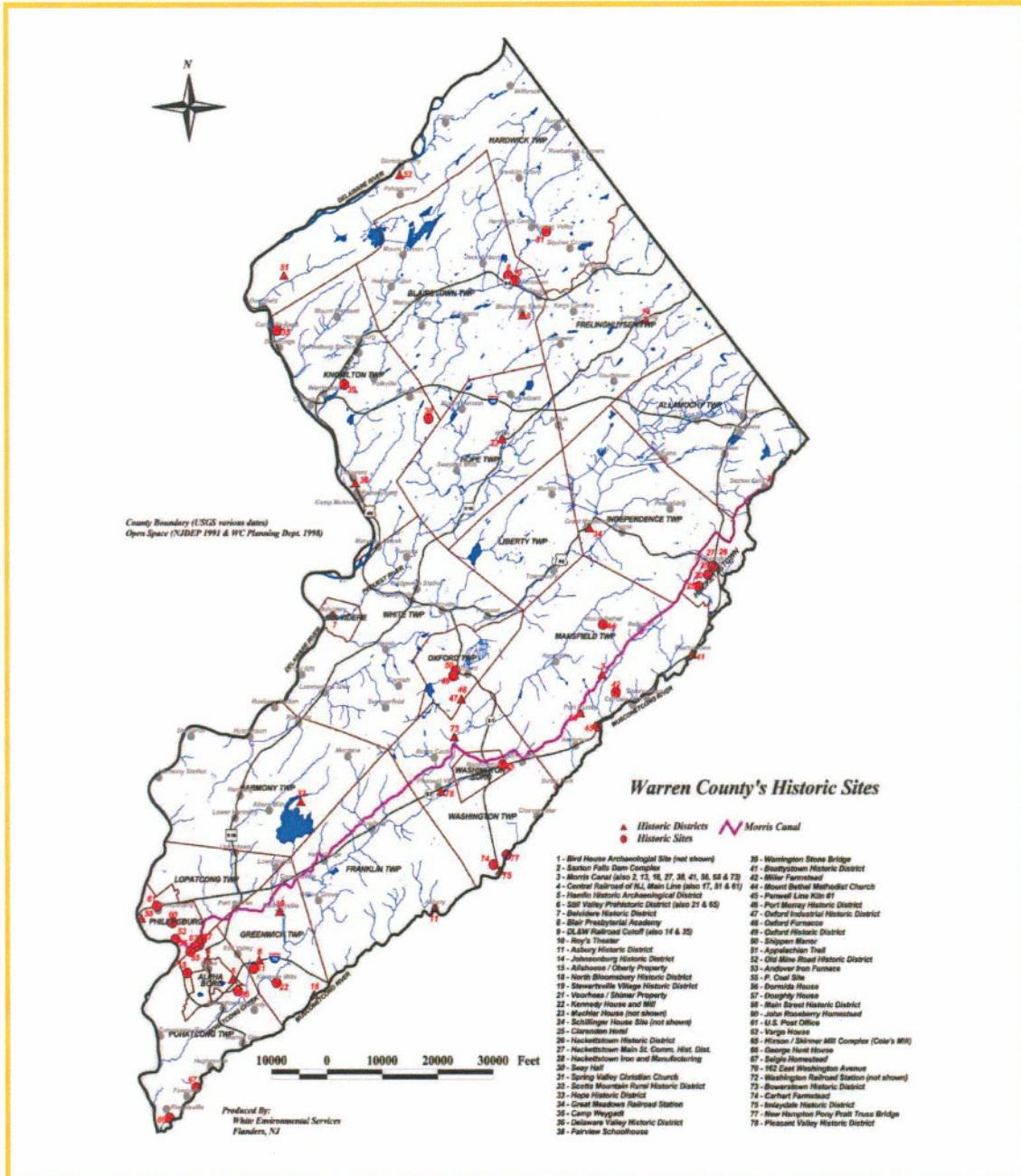
Warren County’s rich history can be traced back to early Dutch settlers. The County was created in 1824 and named after a Revolutionary War Hero, Dr. Joseph Warren. There are many sites and districts that are listed on the State and National Registers of Historic Places. The National Register of Historic Places is the official list of the nation’s preserved historic resources. In addition to the National Register, the State of New Jersey also has compiled a Register of Historic Places documenting local, state and national historic resources of interest. Virtually every municipality in New Jersey has properties that are significant in history, archaeology, architecture or culture. Warren County has one hundred historic sites or districts.

Historic sites and districts such as the Morris Canal, the Hope Historic District, the Belvidere Historic District and the Oxford Historic District, which includes the Shippen Manor, have helped to create communities characteristic of Warren County. **Table 12** below identifies places of historic significance, meaning that they are currently listed on the National Register of Historic Places or may be eligible for it. Their location is shown on **Figure 10** (see next page). Concentrations of historic resources are located in the more highly populated areas of the county including Phillipsburg, Alpha, Washington Township, Mansfield, Blairstown and Hackettstown.

TABLE 12 – HISTORIC RESOURCES

Bird House Archaeological Site Mount Bethel Methodist Church Hackettstown Main St. Historic District Saxton Falls Dam Complex Seay Hall Dormida House Morris Canal Spring Valley Christian Church Main Street Historic District Central Railroad of NJ Main Line Pleasant Valley Historic District Blair Academy Port Murray Historic District Johnsonburg Historic District George Hunt House DL & W Railroad Cutoff Fairview Schoolhouse Seigle Homestead Roy’s Theater Asbury Historic District Allshouse/Oberly Property North Bloomsbury Historic District	Penwell Line Kiln #1 Stewartsville Village Historic District Scotts Mountain Rural Historic District Voorhees/Shimer Property Kennedy House and Mill Muchler House Schillinger House Site Claredon Hotel Appalachian Trail Hackettstown Historic District Oxford Industrial Historic District Hamlin Historic Archaeological District Great Meadows Railroad Station Delaware Village Historic District Still Valley Prehistoric District U.S Post Office Vargo House Belvidere Historic District Camp Weygadt Hixson/Skinner Mill Complex Warrington Stone Bridge	162 East Washington Avenue Washington Railroad Station Beattystown Historic District Miller Farmstead Bowerstown Historic District Carhart Farmstead Hackettstown Iron Imlaydale Historic District Hope Historic District New Hampton Pony Pratt Truss Bridge Allamuchy Freight House Perry Pratt Farmstead Shippen Manor John Richey House Oxford Furnace Oxford Historic District Vass Farmstead Old Mine Road Historic District P. Coal Site John Roseberry Homestead Andover Iron Furnace
Source: Warren County Planning Department		

Figure 10
Historic Resources



F. Environmental Health

The Warren County Health Department (WCHD) monitors the environmental health of the county. Authority for the WCHD to conduct countywide environmental activities, provide education and enforce environmental regulations is granted through the County Environmental Health Act program. Recognizing the importance of environment health in the county and for the purposes of grant applications, the WCHD has developed the *2002 Environmental Health Assessment and Improvement Plan* for Warren County.

The *2002 Environmental Health Assessment and Improvement Plan* establishes countywide goals such as clean air, clean and plentiful water, safe and healthy communities and open and effective government. The clean and plentiful water goal is consistent with the Strategic Growth Plan goal of protecting and enhancing water quality and quantity.

Warren County's environmental health is dependent on a variety of issues, all of which are discussed in the 2002 Plan. Those issues include the following.

Air Quality - Current air quality issues facing Warren County are varied. A July 2000 HRSA report indicated that Warren County met national air quality standards in 1998 for carbon monoxide (CO), nitric oxides (NO_x), sulfur dioxide (SO₂), ozone (O₃), particulates (PM_{2.5} and PM₁₀) and lead (Pb). The 1999 average annual results for the fine particulate monitoring station in Phillipsburg were acceptable. Despite these positive air quality reports, there are concerns facing Warren County air quality.

Significant levels of SO₂ have been reported by the New Jersey Department of Environmental Protection (NJDEP) in the southwestern area of the county. Sources of these elevated levels of SO₂ and possible other pollutants are believed to be power plants located in Pennsylvania. In addition to elevated levels of SO₂, solvent air emissions near Belvidere, hazardous air pollutants and air odor events from biosolids and industrial sources have the potential to negatively impact the air quality in the county. As a result, communities have indicated a desire for additional air quality monitoring.

There are currently three air quality-monitoring stations located in the Belvidere area of Warren County in response to elevated levels of SO₂. The monitoring stations are located at Belvidere High School, the Warren County Administration Building and Scott's Mountain. Each station monitors for sulfur dioxide (SO₂).

Water Quality - Groundwater and surface water quality in Warren County is generally good. Groundwater accounts for all drinking water in the county. While groundwater quality is good, there are some areas identified for actual or potential well contamination.

Groundwater contamination can come from a number of sources. On occasion, the effluent of household sanitary systems can contribute to contamination. Thus, Section III of this Chapter discusses groundwater quality as impacted by the relationship between nitrate contamination and minimum lot sizes.

There are areas in Warren County with groundwater contamination. NJDEP has developed two groundwater contamination area classifications – Classification Exception Areas (CEAs) and Currently Known Extent (CKE) areas. A CEA is an institutional control “in geographically defined areas within which the New Jersey Ground Water Quality Standards (NJGWQS) for specific contaminants have been exceeded,” according to NJDEP definitions. If an area has a CEA designation, the use of ground water in the area is suspended for the duration of the designation. There is a CEA located in Washington Township at the Municipal Garage.

NJDEP defines a CKE as a geographically defined area “within which the local ground water resource are known to be compromised because the water quality exceed drinking water and ground water quality standards for specific contaminants.” There are two CKEs located in Warren County. The largest CKE is the Brass Castle site in Franklin and Washington Townships (also known as the Pohatcong Valley Groundwater Contamination Superfund site). The location of a community water supply at the north end of the contaminated site heightens the vulnerability of water quality in the area. There is also a CKE located on Asbury Road in Independence Township.

A map and description of known contaminated sites can be found on the NJDEP website www.state.nj.us/dep/srp.

The WCHD is taking part in a variety of drinking water protection activities such as enforcement, compliance inspection and oversight of septic and well installations. In addition, WCHD participates in the NJDEP Ambient Stream Monitoring Network and addresses the issue of impaired streams and surface waters.

Emergency Responses/Site Remediation - Approximately 75 hazmat incidents are handled annually by WCHD. Serious events have typically occurred on major highways, including the Interstates. Due to the infrequent occurrence of large incidents, WCHD has maintained a basic response capability. New and increasing threats of bioterrorism and weapons of mass destruction will require that local emergency response systems be upgraded. In an effort to improve interagency coordination and response effectiveness, a County Hazmat Task Force was recently formed.

Underground Storage Tank (UST) - Leaking USTs are a significant source of environmental contamination in Warren County. Inspections in cooperation with NJDEP are carried out to assist in this problem.

Pesticides – The WCHD addresses pesticide control by inspecting application practices and promoting integrated pest management (IPM) practices.

Noise - Noise complaints, while infrequent, can be difficult to resolve. WCHD is responsible for providing personnel and equipment capable of noise investigation.

Radon - Warren County has a Tier 1 designation, which has the highest potential for elevated levels of indoor radon. According to NJDEP, an estimated 50% of the county population is at risk for indoor radon above the 4pCi/l action level. WCHD encourages testing for indoor radon.

Solid Waste - Warren County' solid waste and recycling strategy is outlined in its *Solid Waste Management Plan (SWMP)*. The county contains a Resource Recovery Facility (RRF) in Oxford Township, a landfill in White Township, a permitted composting facility in White Township and one in Harmony Township, and an asphalt and concrete recycling facility in Oxford Township. The recycling of conventional materials such as aluminum, glass and newspapers are handled in each municipality or can be brought to the county recycling center in White Township. Warren County owns the landfill while the RRF is owned and operated by Covanta Energy. Oversight of both facilities is the responsibility of the Pollution Control Financing Authority of Warren County. The SWMP was amended in November 2003 to close and cap the landfill in 2007. On-going issues concerning the solid waste and composting facilities deal with truck traffic, odors, and the impacts on the groundwater quality.

Brownfields - Brownfields are vacant or underutilized sites that are or have the potential to be contaminated with hazardous or toxic substances. The Environmental Protection Agency (EPA) has been funding Brownfield Assessment Demonstration Pilots across the nation since 1995 through its Brownfields Economic Redevelopment Initiative. The State of New Jersey is located in EPA Region 2 and in September of 1999, Phillipsburg was selected as one of several Demonstration Pilots in the Region. Phillipsburg received a \$200,000 grant.

Four sites located in Phillipsburg have been identified for preliminary assessment and site investigation under this initiative. The sites include the Stockton Street property, a parcel of waterfront along the Delaware River, a bike path connecting to the proposed railroad museum and the Ingersoll Rand tract. The largest component of the pilot study is the Ingersoll Rand tract.

IV. WATER QUALITY

The New Jersey Geological Survey's "Recharge-Based Nitrate Dilution Model for New Jersey" was used to assess the ability of soils under existing zoning densities in Warren County to adequately protect water quality. Effluent from individual wastewater disposal systems has the potential to impair water quality. As noted by