

CHAPTER 7: NATURAL RESOURCE CONSERVATION



Preservation of farmland is the cornerstone of the New Jersey Department of Agriculture's (NJDA) *Agricultural Smart Growth Plan* and the Farmland Preservation Program. However, there is more to farmland preservation than merely the retirement of development rights or the outright purchase of farms. One of the cornerstones to a successful, long term Farmland Preservation Program is the conservation of natural resources on farms, without which the long term sustainability and viability of New Jersey's preserved farmland would be in doubt.

Natural Resource Protection Agencies

There are numerous entities, both public and private, which administer, fund, and provide technical guidance for Sussex County farmers relative to natural resource conservation. These entities are in place to assist farmers with natural resource conservation issues, and should be called upon by farmers for appropriate assistance.

Natural Resource Conservation Service

An important partner in support of natural resource conservation for the agricultural community is the United States Department of Agriculture's (USDA), Natural Resources Conservation Service (NRCS). The NRCS "provides assistance to private land owners (including farmers) in the conservation and management of their soil, water, and other natural resources. Local, state, and federal agencies and policymakers also rely on (its) expertise." The NRCS provides technical assistance suited to the natural resource issues that are specific to a farmer's needs, with ample opportunity for cost shares and financial incentives. (*Information For Farmers*)¹

The local NRCS office serving Sussex, Warren, and Morris Counties is located at 101 Bilby Road, Suite 1H in Hackettstown, Warren County. Sussex County farmers may utilize this local NRCS office for assistance. NRCS will also reach out directly to landowners if they know of a farmer who is in need of technical assistance, or can use the guidance of the NRCS staff. The local NRCS office also helps to prepare Conservation Plans for Sussex County Farmers. These Conservation Plans include strategies to conserve soil and water, and may also include conservation practices for flora, fauna, and clean air. If all five elements are included, they are referred to as Resource Management Plans. (*Kent Hardmeyer and/or Ron Phelps*)²

Within one year of selling their development easement, owners of preserved farms are required to enter into a Conservation Plan. The Plans are also a prerequisite to apply for natural resource conservation program grants such as the Wildlife Habitat Incentive Program (WHIP) and Environmental Quality Incentive Program (EQIP). The local NRCS office administers these conservation program grants, which offer financial incentives to support conservation projects, including stream riparian buffers and wildlife habitat. Administration of these grant programs includes field visits to prepare the Conservation Plans, preparation of grant program contracts, assistance with installation of contract conservation practices, and inspection of farms to verify contract conservation practices are implemented and maintained. It should be noted that the Sussex County Soil Conservation District gives final approval on all Conservation Plans and program contracts (*Kent Hardmeyer and/or Ron Phelps*), and the USDA, Farm Service Agency (FSA) assists NRCS in administration of an additional natural resource conservation program entitled Conservation Reserve Enhancement Program (CREP). (*Ken Bingham*)³

Discussions with the local NRCS office indicate the following strategies would strengthen natural resource conservation efforts for Sussex County farms:

- The federal government needs to replenish funding for natural resource conservation grant programs via the proposed 2007 Farm Bill. Currently, all funds are depleted.
- Owners of preserved farms are required to enter into a Conservation Plan within one year of selling their development easement. However, implementation of this requirement is inconsistent. Providing a mechanism and staff to ensure that Conservation Plans are prepared and implemented will guarantee that the objectives of the program are put in place, and active stewardship practices are underway.
- Owners of preserved farms have an obligation to conserve natural resources on their farms. Implementation of a Conservation Plan is a good first step towards fulfilling this obligation.
(*Kent Hardmeyer and/or Ron Phelps*)

The phone number for the local NRCS office is (908) 852-2576, and the District Conservationist is Ronald Phelps. He can also be reached at ron.phelps@nj.usda.gov. (*New Jersey*)⁴ Mr. Phelps and his staff (listed below) can be contacted by Sussex County farmers for assistance, and more information on the availability of NRCS programs in the county.

- Kent Hardmeyer - Resource Conservationist, Highlands Planning Specialist
- Madeline Dean - Program Assistant
- Jim Kleindienst - Civil Engineering Technician
- Jill Koehler - Natural Resource Specialist, Grazing Lands
- Jim Wick - Resource Conservationist

An additional resource for Sussex County farmers is the “*Field Office Technical Guide*” (Guide), which is published by NRCS. It contains technical information about the development and implementation of soil, water, air, flora, and fauna resource conservation practices, and is used to develop Conservation Plans. Each state has its own Guide, which lists and discusses conservation practices particular to a state. These conservation practices improve water and soil quality, improve plant condition, and in some instances can improve air quality. Conservation practices discussed in the Guide that are pertinent for, and used in, Sussex County include:

- Riparian Buffers, including necessary buffer widths and plant species
 - No till and minimum till practices
 - Prescribed grazing and pasture rotation
 - Nutrient management, including manure and fertilizers
 - Animal waste disposal
- (*Kent Hardmeyer and/or Ron Phelps*)

Sussex County Soil Conservation District

Another partner in the conservation of agricultural resources is the New Jersey Department of Agriculture, Division of Agricultural and Natural Resources. Among its responsibilities, the Division implements the natural resource conservation programs, administered by the State Soil Conservation Committee (SSCC). These programs “provide engineering services and regulatory guidance to soil conservation districts, homeowners, engineers, planners and virtually all development activities. The Division provides technical standards applicable to construction and mining sites regulated by the Soil Erosion and Sediment Control Act program ...” (*Agricultural and Natural Resources*)⁵

The SSCC coordinates and supports the work of the state’s 15 local soil conservation districts (SCD), one of which is the Sussex County SCD. The Sussex County SCD is charged with reviewing and approving natural resource conservation and assistance program grants, implementing agricultural conservation planning assistance, agricultural conservation cost-sharing program grants, application of organic materials on agricultural land, agricultural water supply and management, soil erosion and sediment control, storm water discharge authorization, and soil surveys. (*Agricultural and Natural Resources*)

The Sussex County SCD office is located at 186 Halsey Road, Suite 2 in Newton. Sussex County farmers may approach this local SCD office with a Request for Assistance (RFA), to apply for funds from natural resource conservation grant programs such as WHIP and EQIP. If approved, the RFA is forwarded to the local NRCS office in Hackettstown for processing. The administration of the RFA includes preparation of a Conservation Plan and grant program contract, as previously described. The Sussex County SCD is involved in review of Conservation Plans and grant program contracts, and must give final approval to both. (*Kent Hardmeyer and/or Ron Phelps*)

The phone number for the Sussex County SCD office is (973) 579-5074, and the District Manager is Wini Straub. She can also be reached at Sussex@sussexscd.org. Ms. Straub

and her staff (listed below) can be contacted by Sussex County farmers for assistance. (*New Jersey*)

- Joseph Baysa - Erosion Control Inspector
- Jeff Eckert - Erosion Control Inspector
- Cathy Williams - Administrative Assistant
- Peggy Zvalaren - District Clerk

Rutgers Cooperative Extension of Sussex County

The Rutgers Cooperative Extension (RCE) of Sussex County was established in 1912. RCE of Sussex County provides both field and technical research which is focused on finding the best management practices for farmers, to ensure the long term viability of both the agricultural economy and the natural resources upon which it is based.

Relative to natural resource conservation, the RCE offers the Agriculture and Natural Resource Management program. This education program provides “non-biased, research-based educational programs and services for both homeowners and commercial producers. Services offered by extension personnel include soil testing, insect identification, plant disease diagnosis, and pest management recommendations for agricultural operations”, as well as “educational publications covering a wide range of agricultural topics”. Staff members offer programs that are, among other things, designed to “reduce environmental impact.” (*N.J. Agricultural Experiment Station*)⁶ An example is helping to prepare animal waste management plans, so as to reduce impacts to watersheds.

The RCE of Sussex County is located at 129 Morris Turnpike (County Rt. 655), in Frankford Township (mailing address of Newton), in the Homestead Complex. Extension agents include Steve Komar, specializing in commercial plant and animal agriculture, and preparation of animal waste management plans. Brian Oleksak specializes in commercial and consumer horticulture. (*N.J. Agricultural Experiment Station*) They may be contacted with any questions or concerns, or for information on educational programs or services. Mr. Komar can be contacted via e-mail at skomar@njaes.rutgers.edu, while Mr. Oleksak’s e-mail is oleksak@njaes.rutgers.edu. Both can be contacted via phone at 973-948-3040.

The SSCC, NRCS, Sussex County SCD, and Rutgers Cooperative Extension (RCE) of Sussex County, are part of the New Jersey Conservation Partnership. This partnership of agencies strives to further soil and natural resource conservation efforts. (*Agricultural and Natural Resources*)

New Jersey Department of Environmental Protection

The New Jersey Department of Environmental Protection’s (NJDEP), Division of Parks and Forestry, oversees the “Private Lands Management Program”. The aim of this program is to foster wise stewardship and management of the state’s 270,000 acres of private woodlands currently under Farmland Assessment. (*Division of Parks and Forestry*)⁷ Many properties in Sussex County that are farmland assessed include extensive

woodland tracts. Such tracts were added as “farm products” in the 1970’s. These woodland tracts, which must be utilized by the farmer as a sustainable “product”, require Woodland Management Plans (WMPs) to receive reduced local property taxes accorded properties in the farmland tax assessment program. (*Jim Barresi*)⁸

The NJDEP's Division of Parks and Forestry, Bureau of Forest Management (BFM), reviews applications for WMPs, which are prepared for farmers by private consultants. Once a WMP is in place, a “Woodland Data Form” must be submitted yearly to certify that the WMP is being complied with. However, the NJDEP, BFM, also inspects each site once every three years to verify compliance with WMP conditions. (*Jim Barresi*) Since reduced local property taxes are often critical in keeping active agricultural lands economically viable, the NJDEP is an important partner for Sussex County’s farmland preservation efforts.

Non-appurtenant woodlands are acreage on a farm over and above total farmed acreage (tilled and pasture). So, for example, if 50 acres of a farm are tilled or pastured, and there are 125 acres of woodlands on the farm, 75 acres of woodlands would be non-appurtenant (125 woodland acres minus 50 farmed acres). Non-appurtenant woodlands require a WMP. In Sussex County in 2006 there were 33,498 acres of non-appurtenant (or unattached) woodland acres in farmland assessment, (*N.J. Department of Treasury*)⁹ up slightly from 2004 when there were 32,877 acres. However, both these figures are down from the peak of 36,006 acres in 2002. In 1990 there were only 26,927 non-appurtenant acres in farmland assessment. (*Sussex County Agricultural Profile*)¹⁰ Appurtenant woodlands are woodland acreage on a farm, equal to or less than, farmed acreage. So, in the preceding example, 50 of the 125 woodland acres would be appurtenant since the example farm had 50 tilled or pastured (farmed) acres. Appurtenant woodland acres do not require a WMP. (*Jim Barresi*) In Sussex County in 2006 there were 21,717 acres of appurtenant woodland acres in farmland assessment, (*N.J. Department of Treasury*) up from 2004 when there were 20,449 acres of appurtenant (or attached) woodlands in farmland assessment. The total steadily decreased from 1990 (25,633 acres) to 2003 (19,447 acres), until the increase from 2003 to 2004, and again in 2006. (*Sussex County Agricultural Profile*)

The New Jersey Department of Environmental Protection’s Nongame and Endangered Species Program also administers the Landowner Incentive Program (LIP). LIP works to improve habitat, habitat management, and habitat protection for threatened and endangered species on private lands, some of which are agricultural lands. Project durations must be for a minimum of five years, and the property owner contributes a minimum 25 % cost share. Some grain farmers have expressed concern over the use of LIP. This is because it not only provides habitat for threatened and endangered species, but also for such nuisance wildlife as deer and turkey, which are known to cause severe loss to farm products including corn.

In Sussex County there are a total of 53 acres enrolled in LIP on four farms. Of this, 15 acres are planted in warm season grasses, while on the remaining 38 acres delayed mowing is utilized to satisfy LIP habitat requirements. LIP has been in existence for three years,

and funding for the program is competitive due to available funds not being equal to funding requests. (Kim Korth)¹¹

USDA, Forest Service's Forest Stewardship Program

The United States Forest Service sponsors the Forest Stewardship Program. This program supports landowners whose property has a woodland management plan that recognizes and manages the wetlands, wildlife, aesthetics, soil and water in addition to the woodlands on the property. This program, when fully funded, offers landowners cost-share initiatives to allow the landowners to fully follow the guidelines in their woodland management plan. In New Jersey, the state farmland tax program and the U.S. Forest Service program have merged to allow one planning document for the landowner where the stewardship plan meets the state tax code and eliminates conflicts between the two. Increasing enrollment of landowners in this merged state-federal program will ensure increased protection of the natural resources for an extended period. The minimum is a ten-year management plan. This does not ensure preservation of the land in perpetuity, but it does allow recognition of the importance of the land value and stewardship of the property for a longer period of time.

In Sussex County, as of 2007 there are 5,153 acres of farmland on 73 different properties enrolled in the Forest Stewardship program. This has steadily increased since 2003, when there were 4,048 acres on 54 properties. (Jim Haase)¹²

Private Non-profit Groups and Private Citizens

Agriculture needs not only the broad support of state, county, and local governments to help preserve agriculture resources, but also the help of private non-profit groups and citizens. Indeed, without their support, government programs and support for agriculture would fall short of what is needed to protect the natural resource base of the agricultural landscape. These groups and citizens spend countless hours providing and sharing their expertise, as well as raising and contributing money. They are invaluable in assisting with all phases of farmland preservation for Sussex County, including natural resource conservation and stewardship.

The Sussex County agriculture community has the support of a variety of organizations, including the Sussex County Board of Agriculture, New Jersey Farm Bureau, 4-H, Future Farmers of America, and the Sussex County Farm and Horse Show/The New Jersey State Fair.

Local and regional non-profit organizations also contribute to the permanent protection of farmland. These groups include Morris Land Conservancy, The Nature Conservancy, New Jersey Audubon Society, New Jersey Conservation Foundation, Ridge and Valley Conservancy, and Trust for Public Land.

An excellent example of private organization-government cooperation is the Muckshaw Ponds (Andover Township) purchase by The Nature Conservancy. This purchase was

made with the help of a non-profit farmland preservation grant to The Nature Conservancy from the State Agriculture Development Committee. (*Donna Traylor*)¹³

Resource Protection Programs and Funding

2002 and 2007 Farm Bills

The Farm Security and Rural Investment Act of 2002 (2002 Farm Bill) is landmark legislation, with much of its focus on conservation funding and environmental issues. Conservation provisions are designated to assist farmers in being good stewards of the land through grants and technical assistance programs. Voluntary programs relevant to New Jersey, and Sussex County, include the Conservation Reserve Enhancement Program (CREP), Conservation Innovation Grant program (CIG), Environmental Quality Incentives Program (EQIP), Farm and Ranch Land Protection Program (FRPP), Grassland Reserve Program (GRP), Wetlands Reserve Program (WRP), and Wildlife Habitat Incentives Program (WHIP). (*Conservation Programs*)¹⁴ These programs, administered by the local NRCS office in Hackettstown and the Sussex County Soil Conservation District, are discussed in this section.

The proposed 2007 Farm, Nutrition, and Community Investment Act (Farm Bill) would authorize approximately \$7.8 billion nationally to protect natural resources through conservation programs similar to those mentioned above. However, as proposed, the Bill may consolidate most or all of these programs into one program, tentatively titled The Environmental Quality Incentives Program. In addition, the acreage limit on the Wetlands Reserve Program would increase nationally from 2.3 to 3.5 million acres. (*Farm Bill Proposals*)¹⁵

The Mid-Atlantic Region, of which New Jersey is part, is generally underserved by federal farm programs, including the 2002 Farm Bill. The Northeast/Mid-Atlantic region receives on average less than two cents in commodity payments for every dollar in farm sales, in stark contrast to over fifteen cents in some Midwest and Western states. With smaller than average farms, lower profit margins, varied crops, and development pressure, New Jersey has unique farm and food policy needs, which do not match other, larger agricultural states who receive the bulk of commodity payments. (*American Farmland Trust*)¹⁶ However, the commodity payment system may change in the 2007 Farm Bill from price supports to revenue support, with a revenue insurance system if projected revenues for farm(s) are not met. Revenue support with an insurance system would hopefully have a positive effect for Sussex County farmers, since it would help specialty crops and niche markets receive their fair share of commodity payments. (*Jim Baird*)¹⁷

The 2002 Farm Bill expired on September 30, 2007, but was extended via Congressional resolution, and the President's signature. The 2007 Farm Bill was passed by the House of Representatives in early August, 2007. The Senate version of the Farm Bill was passed by the Senate Agriculture Committee on October 25, 2007, with the full Senate expected to vote on the bill in early to mid-November, 2007. Assuming passage by the Full Senate, the 2007 Farm Bill would then be referred to a House-Senate Conference Committee to rectify

any discrepancies between the two Bills. If the Committee cannot rectify the two Bills, or if the Bill is vetoed by the President, it is likely that a two year extension of the 2002 Farm Bill would be enacted into law. (*Jennifer Morrill*)¹⁸ However, if the 2007 Farm Bill is signed into law, the resulting farm and food policy promises to strengthen New Jersey's agriculture and ensure fresh, healthy food supplies while serving to better protect the environment. Some highlights of 2007 Farm Bill, as it relates to natural resource conservation, include:

- Expanding working lands conservation programs and an improved farmland protection program;
- Increasing focus on energy efficiency and on-farm renewable energy production; and,
- Increasing access for the region's producers by providing a minimum base allocation of conservation funding for every state.

(*American Farmland Trust*)

The following is a synopsis of the natural resource conservation programs funded by the 2002 Farm Bill. They are implemented by NRCS and the Sussex County SCD, and also to a minor degree the Farm Service Agency, which is also part of USDA. These programs are the backbone of natural resource conservation efforts in Sussex County.

Conservation Reserve Enhancement Program (CREP) and Conservation Reserve Program (CRP)

Through CREP and CRP, agricultural producers voluntarily retire land to protect environmentally sensitive areas, decrease soil erosion, provide and restore wildlife habitat, and protect ground and surface water. (*New Jersey NRCS Conservation Programs*)¹⁹ Examples of conservation practices include riparian buffers and filter strips for water quality, and contour buffer strips to reduce soil erosion. With incentive payments for farmers to fully implement a CREP contract, payment for this program may be fully funded by NRCS and NJDA. (*Ken Bingham*) Statewide, CREP was most recently funded with \$100 million for the 2004 to 2007 timeframe, and has been used successfully in Sussex County. It is used mostly along streams and rivers to protect water resources. (*Kent Hardmeyer and/or Ron Phelps*)

It is important to note that though funded with \$100 million since 2004, it is reported that only \$12 million of this has been spent, and the remaining \$88 million will revert back to the federal government if not spent by the end of 2007 (such spending is unlikely). There may be numerous reasons for this sub-optimal use of CREP and CRP funding. However, one of the main reasons is due to requirements of other USDA farm land payment programs that require a minimum number of acres in active agricultural production to receive USDA payments. CREP and CRP acres do not count towards these "base acres", and therefore farmers may be reluctant to enter in CREP or CRP since they may lose funding for the agriculture production programs. (*John Parke*)²⁰

Conservation Innovation Grant Program (CIG)

The aim of the CIG program is to stimulate the development and adoption of conservation approaches and technologies which are innovative, in conjunction with agricultural production. Funds are awarded as competitive 50-50 match grants to non-governmental organizations, tribes, or individuals. (*New Jersey NRCS Conservation Programs*) CIG is a component of EQIP, and its grants are generally funded through EQIP (see below). (*Kent Hardmeyer and/or Ron Phelps*)

In Green Township, the AG Choice, LLC compost facility has a CIG grant. Ag Choice is the first NJDEP approved compost facility permitted to collect and receive agricultural waste, such as animal and stall waste, spoiled haylage, and silage, and then compost it for off-farm use. Ag Choice composts agricultural waste into high quality organic, humified compost, which can be safely reintroduced into the environment. (*AG Choice*)²¹

Environmental Quality Incentive Program (EQIP)

EQIP is a conservation program in which farmers receive financial and technical assistance with structural and management conservation practices that address soil, water, and grazing land concerns. (*New Jersey NRCS Conservation Programs*) EQIP is the most popular and widely used conservation program in Sussex County, and is the most well funded of all the programs, receiving approximately \$4 million statewide on an annual basis. In Sussex County, between 2005 and 2007 there are 1,106 contracted acres, with 13 active contracts. (*Janice Reid*)²²

Recently, emphasis in the county has been put on approving grants to replace old, polluting diesel engines, with cleaner burning diesel engines for farm equipment. (*Kent Hardmeyer and/or Ron Phelps*) Nationally, the proposed 2007 Farm Bill would raise authorized EQIP funding to \$1 billion. (*Jim Baird*)

Farm and Ranch Land Protection Program (FRPP)

FRPP provides up to 50% matching funds to purchase development rights and conservation easements to keep farm and rangeland in agricultural use. The USDA partners with state, tribal, or local governments, and non-governmental organizations. (*New Jersey NRCS Conservation Programs*) Farmers accepting funds through this program must adhere to strict impervious surface limitations. Due to these impervious limitations, the Sussex CADB generally does not support FRPP funding for preserved farms. (*Donna Traylor*) In New Jersey, this program receives approximately \$500 thousand to \$1 million annually, most of which goes to the State Agriculture Development Committee or private conservation groups. (*Kent Hardmeyer and/or Ron Phelps*) Nationally, the proposed 2007 Farm Bill would raise authorized FRPP funding to \$300 million. (*Jim Baird*)

Grassland Reserve Program (GRP)

GRP was a program which offered landowners the opportunity to protect, restore, and enhance grasslands, which play a vital role in protecting water quality and providing wildlife habitat on their property. This program was coordinated through several federal agencies (*New Jersey NRCS Conservation Programs*), but has recently become inactive in Sussex County. (*Kent Hardmeyer and/or Ron Phelps*) The proposed 2007 Farm Bill would provide only minimal funding for GRP. (*Jim Baird*)

Wetlands Reserve Program (WRP)

WRP offers farmers payments for restoring and protecting wetlands on their property that had been previously drained for agricultural use. Wetlands help reduce flooding, filter pollutants from water, provide critical wildlife habitat, and protect open space. (*New Jersey NRCS Conservation Programs*) Payment by NRCS is based upon appraised agricultural land value. With appraised values from \$100 to \$2,000 per acre, many farmers are not willing to restore wetlands on otherwise productive agricultural lands. As a result, the WRP is not widely used in Sussex County. (*Tim Dunne*)²³

Wildlife Habitat Incentives Program (WHIP)

WHIP provides technical and financial assistance for creating, enhancing, and maintaining wildlife habitat. The State Technical Committee for WHIP in New Jersey awards project contracts for designated wildlife habitat categories such as for migratory and declining wildlife species, and for pollinators that benefit agriculture. Since its inception in 1998, WHIP has been a popular program for non-federal landowners interested in wildlife habitat management in New Jersey. (*New Jersey NRCS Conservation Programs*) This is second only to EQIP in use for Sussex County, with 193 contracted acres and seven active contracts since 2005. (*Janice Reid*)

SADC Soil and Water Conservation Grants

The New Jersey Department of Agriculture, State Agriculture Development Committee (SADC) provides grants to farms that are permanently preserved, or are enrolled in the eight year preservation program, with priority for preserved farms. (*Wini Straub*)²⁴ Cost share grant funding for fiscal year 2008 has been approved. The purpose of the grants and program is to provide funding for soil and water conservation practices.

The types of soil and water conservation projects funded by SADC include soil erosion and sediment control systems (terrace systems), control of farmland pollution (stream protection; sediment retention, erosion or water control systems; animal waste control facilities; and agri-chemical handling facilities), the impoundment, storage and management of water for agricultural purposes (diversions; water impoundment reservoirs; irrigation systems; and, drainage systems), and management of land to achieve maximum agricultural productivity (land shaping or grading). (*Soil and Water Conservation Grants*)²⁵

These grants fund soil and water conservation projects approved by the Sussex County Soil Conservation District (District), with the program administered by both the District and the local NRCS office in Hackettstown. Both the District and the local NRCS office also provide technical assistance for eight year program projects. Once the District deems the conservation project necessary and feasible, applications are forwarded to the N.J. State Soil Conservation Committee, which recommends projects to the SADC for funding approvals. (*Soil and Water Conservation Grants*) Traditionally 50 % of the costs of approved soil and water conservation projects are paid with grant funds, but up to 75 % has been approved in the past. (*Wini Straub*)

Monitoring visits are an opportunity to accomplish a variety of objectives. In addition to ascertaining that all requirements of the deed of easement are being met, the overall condition of the farm can be viewed. Questions are asked regarding the farmer's Farm Conservation Plan and whether any funded projects under the Soil and Water Conservation Cost Share program are being utilized. If not, the protocols of that program are described by staff. In addition, current brochures and program information provided by the Natural Resource Conservation Service are distributed at the time of monitoring. Farmers are also asked to describe any potential right to farm issues or trespass violations being encountered. Finally, farmers are reminded that should they ever need assistance of any kind, the Office of Farmland Preservation is there for them.

Water Resources

The Importance of the Water Resource

The protection of the water resource as it relates to agriculture and farmland preservation in Sussex County cannot be overstated. Quite simply, without a consistent, plentiful, adequate and clean water source, agriculture cannot exist. In addition, farms are critical as open space areas to provide aquifer water recharge. To a certain extent, some aspects of ensuring clean and plentiful water can be controlled at the individual farm level. These include:

- Minimizing use of synthetic chemicals such as fertilizers, herbicides, pesticides, and fungicides, so as to lessen impacts to groundwater;
- Providing riparian buffers along watercourses, so as to protect streams from the aforementioned synthetic chemicals;
- When possible, practicing organic farming methods;
- Practicing appropriate timing of chemical application, so as to minimize its use; and,
- Practicing water conservation techniques, such as drip irrigation and water re-use for certain types of farming where feasible, such as smaller scale vegetable and fruit operations.

The necessity of clean and plentiful water is emphasized in the 2007 *Sussex County Strategic Growth Plan*. The plan begins with a multilayered vision statement for Sussex

County, with one of the visions being a place where “The water is pure”. Critical development issues are also listed, with two pertaining to the water resource. These include “resource conservation with emphasis on water supply”, and “water quality, emphasizing the importance of stream buffers, wetlands protection, and upgraded individual discharges”. (*Sussex County Strategic Growth Plan*)²⁶ These goals are in line with clean and plentiful water for agriculture.

This necessity of clean and plentiful water, the importance of agriculture to the water resource, and the importance of the water resource to agriculture, is stated in the 2003 *Sussex County Comprehensive Farmland Preservation Plan*. The Plan states that “Agricultural use of land contributes food and fiber, clean air, stormwater management, groundwater recharge, wildlife habitat, and valued open vistas”. The Plan also states that “The goals that are being considered for adoption as part of the Sussex County Open Space and Recreation Plan are also consistent with the goals and mission statement of the Sussex County Agriculture Development Board”. One of the proposed goals is “protection of water quality and quantity”. Finally, relative to the importance of the water resource, the Plan states that “The land resources are the basis of water quality and quantity, habitat, vistas, and rural character”. As with the 2007 *Sussex County Strategic Growth Plan*, these goals are in line with clean and plentiful water for agriculture. (*Sussex County Comprehensive Farmland Preservation Plan*)²⁷

In addition, the *State Development and Redevelopment Plan* also discusses the importance of the water resource. The Plan states:

All of Sussex County’s farmland is found in areas mapped as Rural Planning Area, Rural Environmentally Sensitive Planning Area or Environmentally Sensitive Planning Area in the *State Development and Redevelopment Plan*, where the goals include support for maintenance and improvement of the agricultural industry’s economic viability. The goal of the Rural Planning Area for agriculture is to “guide development to ensure the viability of agriculture and the retention of farmland in agricultural areas; encourage farmland retention and minimize conflicts between agricultural practices and the location of Centers; ensure the availability of adequate water resources and large, contiguous tracts of land with minimal land-use conflicts ...” (*New Jersey State Development and Redevelopment Plan*)

Agricultural goals in Rural Environmentally Sensitive Planning Areas and Environmentally Sensitive Planning Areas include, “... guiding development away from agriculture, minimizing conflict between agriculture and Centers, ensuring adequate water supply, protecting large tracts of land, and promoting more intensive, new-crop agriculture.” (*New Jersey State Development and Redevelopment Plan*)²⁸

Finally, emphasis is given to the importance of the water resource, via the New Jersey Department of Agriculture which “... is working with Rutgers Cooperative Extension, the Natural Resources Conservation Services, the United States Geological Survey, the New Jersey Department of Environmental Protection and the farm community to assess the water needs of agriculture and to assist in the development of essential rules, policies and

guidelines to ensure an adequate water supply to meet the current and future needs of the agricultural industry.” (*Agricultural Smart Growth Plan 2006*)²⁹

Physical Features and Water Aquifer Supply Characteristics

The physiographic and geologic layout of Sussex County dictates water supply, availability and recharge, as discussed in the *2003 Comprehensive Farmland Preservation Plan: (Sussex County’s Comprehensive Farmland Preservation Plan)*

Much of Sussex County is located within the Appalachian Ridge and Valley physiographic province, a large geologic formation extending for about 1,200 miles between Alabama and the St. Lawrence Valley in Canada. Geologic pressures during the Precambrian Era folded and compressed the upper layers of the earth producing these ridges and valleys, which in more recent times, have been shaped by glaciers, wind, and streams.

The Appalachian Mountains in Sussex County are called Kittatinny Ridge. This is actually a chain of mountains, between 1,600 and 1,800 feet in height, with a ridge-like appearance. High Point, at 1,803 feet, is the highest point in this chain. It is located in the northernmost part of the County. The Kittatinny Valley, which is east of the ridge, and the northern portion of the Upper Delaware Valley (also called the Minisink Valley), that is west of the ridge, are the locations of most of the farms in Sussex County. Other mountains in Sussex County, east of the Kittatinny Valley, are part of the Highlands physiographic province. These include the Sparta Mountains and Waywayanda Mountain, along with an outlier, Pochuck Mountain.

It was the valleys, however, with their rolling hills, which attracted the early settlers leaving the more densely populated areas to the south and east. These valleys are the areas where the prime soils are located that farmers have found very suitable for pasture, cropland, and the farming of fruits and vegetables.

Portions of the Kittatinny Valley are underlain with Kittatinny and Jacksonburg limestones creating the potential for sinkhole ponds and limestone fens. Although they can occur on other geologic units, the greatest extents of these unique features are found where glacial till overlies limestone formations in the Appalachian Ridge and Valley Region. This unique environment supports plants that tolerate alkaline conditions and other species associated with these plants. The bog turtle and several grassland bird species are of special interest here because agriculture plays a role in the creation of their unique habitat as well. The bog turtle lays its eggs in the hoof prints of cattle or horses roaming in the pasture. The bobolink and the savannah, grasshopper and Vesper sparrows forage for food in the plowed fields and nest in the grasslands.

The Delaware Valley and the southern portion of the Kittatinny Valley are within the Upper Delaware River Watershed where streams flow to the Delaware River. The northern portion of the Kittatinny Valley is in the Wallkill River Watershed. Both of these watersheds contain streams or portions of streams that are classified as trout production streams and trout maintenance streams.

The climate associated with this landscape is very suitable for agriculture. There are however, periods of drought that occur in cycles, historically, about every fifteen or so years. According to the National Climatic Data Center in Asheville, North Carolina, the average annual rainfall for Newton, New Jersey is 47.22 inches. This is based on data from the years 1971-2000 and includes the August 2000 storm.

Water Conservation Strategies

An adequate water supply is important to successful agriculture operations in Sussex County. Droughts in recent years have highlighted the precarious nature of the agriculture (and general) water supply, and the need for water conservation systems and regimens.

The State Agriculture Development Committee and the NJDA, through the *Agricultural Smart Growth Plan*, encourage farmers to "... work to accelerate the use of efficient water conservation technologies, such as drip irrigation. Identify and promote new and efficient methods to conduct water distribution on farms, utilizing farm ponds and water reuse options." (*Agricultural Smart Growth Plan 2006*)

The dominant crops in Sussex County are hay and corn which rely on rain, and to some extent groundwater, for water needs. Hence, water conservation strategies per se are difficult to implement in the county. With the more water intensive vegetable and fruit farming, and nursery agriculture, it is possible to implement conservation strategies such as drip irrigation, water reuse, or watering crops in the cooler parts of the day. However, since vegetable, fruit and nursery agriculture are minor (in acreage) to corn and hay, the positive effects of water conservation efforts for the county are minimized. This is evidenced by the fact that the amount of irrigated farmland in Sussex County is relatively small. In 2002, 642 acres were irrigated on 93 farms, which is less than 1% of the farmland and 10% of the county's farms. There has been very little public concern expressed regarding future availability of groundwater for irrigation.

However, water intensive agriculture and processes may become more prevalent in the future. This is suggested by the fact that irrigated acres in the county has nearly doubled from 1982 to 2002. This is partly attributable to the increase in nursery and vegetable farms since 1982, and also the fact that 2002 was a drought year, with some agriculture operations using additional water resources. Therefore, water conservation strategies may become more important, and should be maximized where possible.

Waste Management and Recycling

Management of livestock waste has important implications for the quality of ground and surface waters. Unchecked, or poorly managed, these wastes can cause serious water quality problems by the introduction of unwanted microorganisms into natural systems. Poor management of animal waste can also cause disease among farm animals. Proper animal waste management is not only required, but is environmentally responsible, as is

recycling of farm by-products whenever possible. Therefore, a discussion of animal waste management and recycling efforts in Sussex County is warranted.

Waste Management in Sussex County

Discussion with the local NRCS office in Hackettstown indicates the following regarding animal and crop waste management in Sussex County:

- Many farmers have “Nutrient Management Plans” to manage the manure generated on their farms.
- Ag Choice, LLC in Green Township is operated by Jay and Jill Fisher. Ag Choice picks up or accepts, and then composts, horse waste. It is then available as bulk pickup, is sold to landscapers, garden centers, or is bagged and sold at retail outlets. This type of operation not only helps control the problem of horse waste on farms (see below), but is also a good revenue source for the Fishers. Other Sussex County farmers can review the Ag Choice operation to ascertain if similar operations might be beneficial to them. The Ag Choice website is <http://www.ag-choice.com/>.
- Horse waste on farms can be a problem. This is due in part to the relatively small land area of horse farms, making the manure more difficult to effectively and safely distribute on fields. This can spread diseases from the horse manure. Sussex County is aware that more needs to be done to control this problem.
- Relative to disease, cattle manure is not as serious a problem as horse manure. This is due in part to the relatively large land area of dairy farms, making it easier to safely and effectively distribute the manure on fields. This helps to control the spread of disease. *(Kent Hardmeyer and/or Ron Phelps)*

Concentrated Animal Feeding Operations & Animal Feed Operations

Concentrated Animal Feeding Operations (CAFO) as defined at N.J.A.C. 7:14A-2.13 (New Jersey Pollutant Discharge Elimination System (NJPDES)) are:

- Operations with more than 1,000 slaughter or feeder cattle, 700 dairy cattle, 2,500 swine, 500 horses or other animal populations. Sussex County does not have any livestock operations of this size; or
- Operations with more than 300 slaughter or feeder cattle, 200 dairy cattle, 750 swine, 150 horses or other animal populations, and which discharge pollutants directly to state waterways either through manmade devices or as a result of water passing through the facility or having direct contact with confined animals. *(New Jersey Discharger)³⁰*

A number of Sussex county farms do fit into this latter category, and are required to have waste management plans to ensure that animal wastes are properly managed. In addition, any livestock operation receiving EQIP funds must have a waste management plan.

Concentrated Animal Feeding Operations (CAFOs) and Animal Feeding Operations (AFOs) have the potential to, or currently do, cause water pollution through the collection

of large amounts of animal waste in relatively small areas. Mismanagement of the animal waste has the potential to cause large amounts of soil and groundwater contamination via introduction of the bacteria, fecal coliform, a known contaminant from animal farming operations. The state's agricultural community bears a responsibility to help protect and restore natural resources for which they are the stewards.

The New Jersey Department of Environmental Protection (NJDEP) has outlined a statewide strategy to manage and regulate these operations. The strategy calls for NJDEP to administer CAFO permits, and NJDA to administer the appropriate measures for AFOs. (*Agricultural Smart Growth Plan 2006*) The permits and measures require development and implementation of comprehensive waste management plans, utilizing "animal waste standards", proposed by NJDA for adoption in late 2007, or early 2008. (*Monique Purcell*)³¹ The strategy emphasizes the use of cost-effective voluntary measures, limiting the need for permits. (*Agricultural Smart Growth Plan 2006*) It is important to note that the Rutgers Cooperative Extension agent from Sussex County is one of the few individuals in New Jersey certified to develop comprehensive waste management plans.

NJDEP, Division of Water Quality - Concentrated Animal Feeding Operations

To protect the quality of surface and groundwater in and around animal farming operations, the NJDEP has adopted a general permit for managing and regulating Concentrated Animal Feeding Operations (CAFOs). The permit is administered through the New Jersey Pollutant Discharge Elimination System (NJPDES) regulations at N.J.A.C. 7:14A-2.13, under authority of the Water Pollution Control Act. In general, the permits require CAFOs to comply with the federal effluent limitation guidelines that prohibit discharge to state waters. (*New Jersey Discharger*)

The New Jersey Department of Agriculture, State Soil Conservation Committee, Natural Resources Conservation Service and New Jersey Soil Conservation Districts have partnered with NJDEP to implement the general permit as part of a statewide strategy to control pollution from CAFOs. (*New Jersey Discharger*)

Recycling

Recycling is an important part of natural resource conservation for the agriculture industry. Recycling saves natural resources, and can also save farmers money through creative reuse, such as using leaves and grass clippings to mulch and fertilize farm fields, and saving on solid waste disposal costs. Recycling reduces the amount of refuse finding its way to limited landfill space. The NJDA has a strong commitment to ensuring compliance with New Jersey's mandatory recycling regulations. Additional information on New Jersey's various agricultural recycling programs can be obtained by contacting the Recycling Program Manager at NJDA, at (609) 292-5536. (*New Jersey Agricultural Recycling Programs*)³²

Corn and hay, the dominant farm product by acreage in Sussex County, use limited products which can be recycled, and as such limits recycling opportunities. However, the

expanding and important nursery industry in Sussex County can recycle such items as nursery film. To this end, the Sussex County Municipal Utilities Authority (MUA) is currently working with the NJDA to develop a program for recycling nursery film in the county. The source for recycling materials would be plastic film coverings for greenhouses, which have to be replaced often, and shrink wrap used to wrap supplies while shipping or storing. If the program is successful, potting and pesticide containers may be added at a later date. The MUA is hoping to establish the program by the end of 2007. The MUA Commissioners, who must approve any recycling program, are reported to be receptive to this idea of recycling nursery film, which would be a self financing program via a drop-off charge. (*Renee Casapulla*)³³

Energy Conservation

Energy conservation makes economic sense for Sussex County agriculture businesses. The less energy a farmer uses, the less money spent on energy, and the more money that can be invested elsewhere, or realized as profit. However, energy conservation and the use of alternate technologies also make environmental sense. They help keep the air, water, and soil clean, and minimize or eliminate further pollution to these critical agricultural resources. Also, with global warming due to excessive carbon dioxide emissions in the atmosphere, energy conservation and the use of alternate energy sources can help to slow this warming trend.

In its 2006 “*Agricultural Smart Growth Plan*”, the New Jersey Department of Agriculture emphasizes the importance of energy conservation and alternative energy use. The Plan indicates that it is important to:

“Promote the use of innovative technologies, recycling, energy conservation and renewable energy systems on New Jersey’s farms” and to “promote, provide technical assistance for, and inform the agricultural community about new and existing energy conservation and renewable energy programs by promoting the financial and environmental benefits of implementing these programs.” Also, the NJDA indicates that *“Through (these) numerous efforts coordinated between the state and federal levels, New Jersey’s agricultural community is proving itself to be an important player in protecting our state’s natural resources. Clearly, there is more work to be done, and the agricultural community has shown initiative in pursuing alternative energy sources, such as solar, wind and bio-gas in running farm operations, and by being a leader in the pursuit of ethanol and bio-diesel fuel markets.”* (*Agricultural Smart Growth Plan 2006*)

The SADC does not have a formal policy for the use of wind and solar energy on commercial farms. However, discussions with the SADC indicate:

- SADC is supportive of solar and wind energy use on commercial farms as long as the main purpose of the produced energy is for use on the farm. This does not preclude the sale of excess energy production back to the power grid; and,

- Installation of solar panels, wind turbines and other appurtenant equipment must not negatively impact production of the agricultural land, and agricultural land must not be taken out of production. (*Steve Bruder*)³⁴

At present, there is only minimal effort to initiate energy conservation at the county level. The EQIP natural resource conservation program pays for some energy production programs, such as the aforementioned replacement of older, dirty polluting diesel engines, with newer, more efficient, cleaner burning engines. EQIP also pays rebates to farmers for the use of bio-diesel, and is also used to rebate farmers who have installed solar panels. (*Kent Hardmeyer and/or Ron Phelps*) Energy conservation and renewable energy is one area that Sussex County agricultural entities such as the Sussex County Board of Agriculture and N.J. Farm Bureau, along with the wider agriculture community, could explore to assist farmers in saving money, and subsequently provide ecological benefit.

Solar Energy

Solar energy can be harnessed via the installation of solar panels. This harnessed or stored energy can then be used to create electricity and provide heat. If excess electricity is generated, it can be sold back to the electric grid for a profit. The overall use of solar panels has greatly increased in New Jersey. (*Agriculture and Green Energy*)³⁵ EQIP does provide some funding for solar panels, and farmers interested in using this alternate energy source can contact the local NRCS office in Hackettstown for more information.

Other programs available to help agricultural producers take advantage of this technology include the U.S. Department of Energy, “Solar Energy Technology Program”, <http://www1.eere.energy.gov/solar/> and the “Solar Energy for New Jersey Agriculture” work and information sheet at <http://www.state.nj.us/agriculture/pdf/solarenergyguide.pdf>. (*Agriculture and Green Energy*) Solar energy is one of the fastest growing sectors in the alternative energy market, and Sussex County farmers can take advantage of this money and energy saving technology.

Wind Energy

The power of a strong wind can be captured by turbines or windmills, turning such power into electricity. Expanding and evolving technology is making this option more attractive to farmers as a way to cut energy costs. According to the NJDA the northwestern part of New Jersey, which includes Sussex County, has ample and consistent enough wind power to make turbine energy feasible. (*Agricultural Smart Growth Plan 2006*) One possible roadblock to the use of wind turbines, is that few, if any, municipal ordinances allow the use of wind turbines. (*Eric Snyder*)³⁶ If this is indeed the case, then the Sussex County CADB should work with the county planning department and local towns to study and approve wind turbines as an allowed use.

Ethanol

Ethanol is a renewable fuel “made by distilling the starch and sugar in a variety of plants.” (*Agriculture and Green Energy*) It can then be blended into gasoline as an “oxygenate”, reducing air pollution. Its use also reduces dependence on foreign oil, and the harmful environmental effects of oil drilling. Also, unlike the gasoline additive MTBE, ethanol does not contaminate groundwater. (*Agriculture and Green Energy*) Corn, the dominant field crop in Sussex County (along with hay), could position Sussex County farmers to financially capitalize on the spreading movement towards ethanol-blended fuels. More study would need to be done on whether this would be profitable for county farmers, and how it would affect other local agriculture industries (for instance, how it would affect the dairy industry’s supply of, and price for, feed corn). The feasibility of using Sussex County corn for ethanol production is also somewhat dependent on the proximity of any future ethanol plants, and this aspect should be included in any future studies.

Renewable Energy Grant Programs

The NJDA provides the following information on renewable energy grant programs, which can help encourage the use of these energy sources:

- *New Jersey Clean Energy Program*: Administered by the New Jersey Board of Public Utilities, this program provides financial incentives to install clean energy systems, including fuel cells, solar energy, small wind and sustainable biomass equipment. Financial incentives are in the form of rebates, grants, and loans. Additional information is available at www.njcep.com/.
- *Renewable Energy Systems and Energy Efficiency Improvements Program*: As part of the 2002 Farm Bill, this program “funds grants and loan guarantees to agricultural producers for assistance with purchasing renewable energy systems and making energy efficiency improvements”. Final rules for loans and grants were adopted by the U.S. Department of Agriculture in July 2005. The proposed 2007 Farm Bill would continue this funding. Additional information can be found at www.rurdev.usda.gov/rbs/farmbill/index.html.
- *Biomass Research and Development Initiative Grants*: The United States Departments of Agriculture and Energy support the development of biomass energy. Grants are available for research, development, and demonstrations on bio-based products, bio-energy, bio-fuels, bio-power and additional related processes. In the recent past, grants have focused on development and demonstration projects that led to greater commercialization. Additional information is available at the following website: <http://www.state.nj.us/agriculture/news/hottopics/topics060222.html>. (*Agriculture and Green Energy*)

¹ United States Department of Agriculture, Natural Resources Conservation Service. Information For Farmers. <http://www.nj.nrcs.usda.gov/farmers.html>. Accessed April 2007.

² Personal Communication with Kent Hardmeyer and/or Ron Phelps, United States Department of Agriculture, Natural Resources Conservation Service, May 15 and 16, 2007; June 6 and 22, 2007.

³ Personal Communication with Ken Bingham, United States Department of Agriculture, Farm Service Agency. June 11, 2007.

⁴ United States Department of Agriculture, Natural Resources Conservation Service, New Jersey. <http://www.nj.nrcs.usda.gov/>. Accessed March 2007.

⁵ New Jersey Department of Agriculture, Agricultural and Natural Resources. <http://www.state.nj.us/agriculture/divisions/anr/>. Accessed April 2007.

⁶ New Jersey Agricultural Experiment Station, Rutgers Cooperative Research & Extension of Sussex County. <http://sussex.rcrc.rutgers.edu/>. Accessed April 2007.

⁷ New Jersey Department of Environmental Protection, Division of Parks and Forestry, Private Lands Management Program. http://www.nj.gov/dep/parksandforests/forest/njfs_private_lands_mgt.html. Accessed April 2007.

⁸ Personal Communication with Jim Barresi, Assistant Director, New Jersey Department of Environmental Protection, Division of Parks and Forestry. June 12, 2007.

⁹ New Jersey Department of Treasury, Division of Taxation. Farmland Assessment Act of 1964, Chapter 48, Laws of 1964, Revised, Thirty Eighth Report Of Data From FA-1 Forms For 2006 Tax Year. December 2006.

¹⁰ New Jersey Department of Agriculture, State Agriculture Development Committee, Sussex County Agricultural Profile, April 13, 2007.

¹¹ Personal communication, Kim Korth, New Jersey Department of Environmental Protection, Non-game Endangered Species Program. July 24, 2007.

¹² Personal communication, Jim Haase, New Jersey Department of Environmental Protection, New Jersey Forest Service. July 20, 2007.

¹³ Personal Communication with Donna Traylor, Sussex County Division of Planning, Office of Conservation and Farmland Preservation. June 9, 2007.

¹⁴ United States Department of Agriculture. Conservation Programs Offered In New Jersey, Programs Available in 2006. ftp://ftp-fc.sc.egov.usda.gov/NJ/programs/Conservation_Programs_Offered_in_New_Jersey.pdf. Accessed April 2007.

¹⁵ United States Department of Agriculture, Fact Sheet, USDA'S 2007 Farm Bill Proposals. http://www.usda.gov/wps/portal/!ut/p/_s.7_0_A/7_0_1UH?contentidonly=true&contentid=2007/01/0019.xml Accessed April 2007.

¹⁶ American Farmland Trust, The Farm, Nutrition and Community Investment Act. http://www.farmland.org/programs/states/me/documents/AFT_FNCIA_S-D-G_Northeast_WebApr07.pdf. Accessed June 2007.

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- ¹⁷ Personal Communication with Jim Baird, Mid-Atlantic Region Director, American Farmland Trust. June 2007.
- ¹⁸ Personal communication with Jennifer Morrill, Director of Media Relations, American Farmland Trust. October 29, 2007.
- ¹⁹ United States Department of Agriculture, New Jersey NRCS Conservation Programs. <http://www.nj.nrcs.usda.gov/programs/>. Accessed April 2007.
- ²⁰ Personal Communication, John Parke, New Jersey Audubon Society. September, 7, 2007.
- ²¹ AG Choice, LLC. <http://www.ag-choice.com/index.html>. Accessed June 2007.
- ²² Personal Communication with Janice Reid, Assistant State Conservationist, USDA, NRCS. June 26, 2007.
- ²³ Personal Communication with Tim Dunne, USDA, NRCS. June 25, 2007.
- ²⁴ Personal Communication with Wini Straub, District Manager, Sussex County Soil Conservation District. June 19, 2007.
- ²⁵ New Jersey Department of Agriculture, Soil and Water Conservation Grants. <http://www.state.nj.us/agriculture/grants/soil.html>. Accessed April 2007.
- ²⁶ Sussex County, Sussex County Strategic Growth Plan. <http://www.sussex.nj.us/documents/planning/6%20sgp.pdf>. Accessed April 2007.
- ²⁷ Sussex County Agriculture Development Board, Sussex County's Comprehensive Farmland Preservation Plan. <http://www.sussex.nj.us/cit-e-access/webpage.cfm?TID=7&TPID=5513>. Accessed March 2007.
- ²⁸ New Jersey Department of Community Affairs, Office of Smart Growth. New Jersey State Development and Redevelopment Plan. <http://www.nj.gov/dca/osg/plan/stateplan.shtml>. Accessed June 2007.
- ²⁹ New Jersey Department of Agriculture, Agricultural Smart Growth Plan 2006 <http://www.state.nj.us/agriculture/pdf/smartgrowthplan.pdf>. Accessed April 2007.
- ³⁰ New Jersey Department of Environmental Protection, New Jersey Discharger, Volume 11, No. 2, Fall 2003. New Stormwater General Permit for Concentrated Animal Feeding Operations. <http://www.state.nj.us/dep/dwq/discharg/v11n2h.htm>. Accessed April 2007.
- ³¹ Personal communication with Monique Purcell, NJDA, Division of Agriculture and Natural Resources.
- ³² New Jersey Department of Agriculture, New Jersey Agricultural Recycling Programs. <http://www.nj.gov/agriculture/divisions/md/prog/recycling.html>. Accessed, April 2007.
- ³³ Personal Communication, Renee Casapulla, Recycling Coordinator, Sussex County Municipal Utilities
- ³⁴ Personal Communication, Steve Bruder, State Agriculture Development Committee.
- ³⁵ New Jersey Department of Agriculture, Agriculture and Green Energy. <http://www.state.nj.us/agriculture/news/hottopics/topics060222.html>. Accessed April 2007.
- ³⁶ Personal Communication, Eric Snyder, Director, Sussex County Division of Planning.