West Nantmeal Township

Act 537

September 2004

Prepared by:

Gannett Fleming

1.0 Executive Summary

West Nantmeal Township is a rural, farming community of approximately 2000 residents situated in northwestern Chester County. For the purpose of this plan, the entire Township will be considered the study area. In accordance with Title 25, Chapter 71 of the Pennsylvania Code, West Nantmeal is required to "develop and implement a comprehensive official plan to provide for the resolution of existing sewage disposal problems, provide for future disposal needs of new land development, and provide for the future sewage disposal needs of the Township."

Based on the characteristics of the Township, numerous alternatives were evaluated as part of this Plan. The Township desires to address existing malfunctioning systems and provide for the needs of development in a manner that creates the least disturbance to the rural characteristics of the Township. To that end, this Plan has provided a hierarchy of alternatives that must be looked at for each applicable situation. The alternatives are as follows: 1) Conventional on-lot systems with Soil Absorption Fields, 2) Conventional on-lot systems with Sand Mounds, 3) Aerobic Tank Treatment with Soil Absorption Field, 4) Individual Treatment with Spray or Stream discharge, 5) Centralized Community On-Lot Systems (COLDS), 6) Community Sewer Systems, and 7) No Action Alternative.

The recommendation of this Plan is to provide for individual projects to "screen" each of the listed alternatives. The least impact to the environment and rural nature of the community will be considered by the Township for approval. It is the developer's or landowner's responsibility to evaluate the alternatives in accordance with PADEP requirements, Chester County Health Department requirements, Chester County Health Department requirements, County Planning documents, and local planning and code enforcement documents.

The Township has funded this Act 537 plan to establish the rules for evaluating wastewater needs of the Community through existing funds and the PADEP grant program. The Township has also invested in establishing an on-lot management program and continues to implement it. Any additional cost to implement the selected alternative

for a specific project will be at the developer's expense.

Most of the graphic information depicted in this Study was derived from Chester County GIS sources, as revised by local reviews. Certain demographic and utility use projections were derived from various Chester County publications and do not necessarily represent policies established by or which shall be binding upon West Nantmeal Township.

2.0 Introduction

2.1. Purpose of the Plan

The Pennsylvania Sewage Facilities Act (Act 537) was enacted by the Pennsylvania Legislature in 1966. The Act requires that every municipality in the State develop and maintain an up-to-date sewage facilities plan. West Nantmeal Township's current Act 537 Plan is the Chester County's Master Sewage Facilities Plan which was last revised in 1970. The County Plan provided recommendations for planning over a 20-year period, and is therefore obsolete with respect to current and future sewage facilities planning needs in the Township.

In accordance with Title 25, Chapter 71 of the Pennsylvania Code (Administration of the Sewage Facilities Planning Program), West Nantmeal Township is required "to develop and implement a comprehensive official plan to provide for the resolution of existing sewage disposal problems, provide for the future sewage disposal needs of new land development, and provide for the future sewage disposal needs of the Township." The purpose of this plan, therefore, is to meet the above regulatory requirement and provide a comprehensive sewage facilities planning document that will guide West Nantmeal Township officials in decision making over the next 5 to 10 year planning period. The plan additionally is to protect the health, safety, and welfare of the citizens living in West Nantmeal Township and to help prevent future sewage disposal problems from occurring. Finally, the purpose of the plan is to provide protection for both the groundwater and surface water resources within the Township and its watersheds.

2.2. Scope of the Plan

The scope of this Act 537 Sewage Facilities Plan includes the entire Township of West Nantmeal in Chester County, Pennsylvania. A hierarchy of wastewater management alternatives will be identified to be consistent with the rural zoning of the community.

3.0 Description of the Planning Area

3.1. Physical Characteristics of West Nantmeal Township

3.1.1. Regional Setting

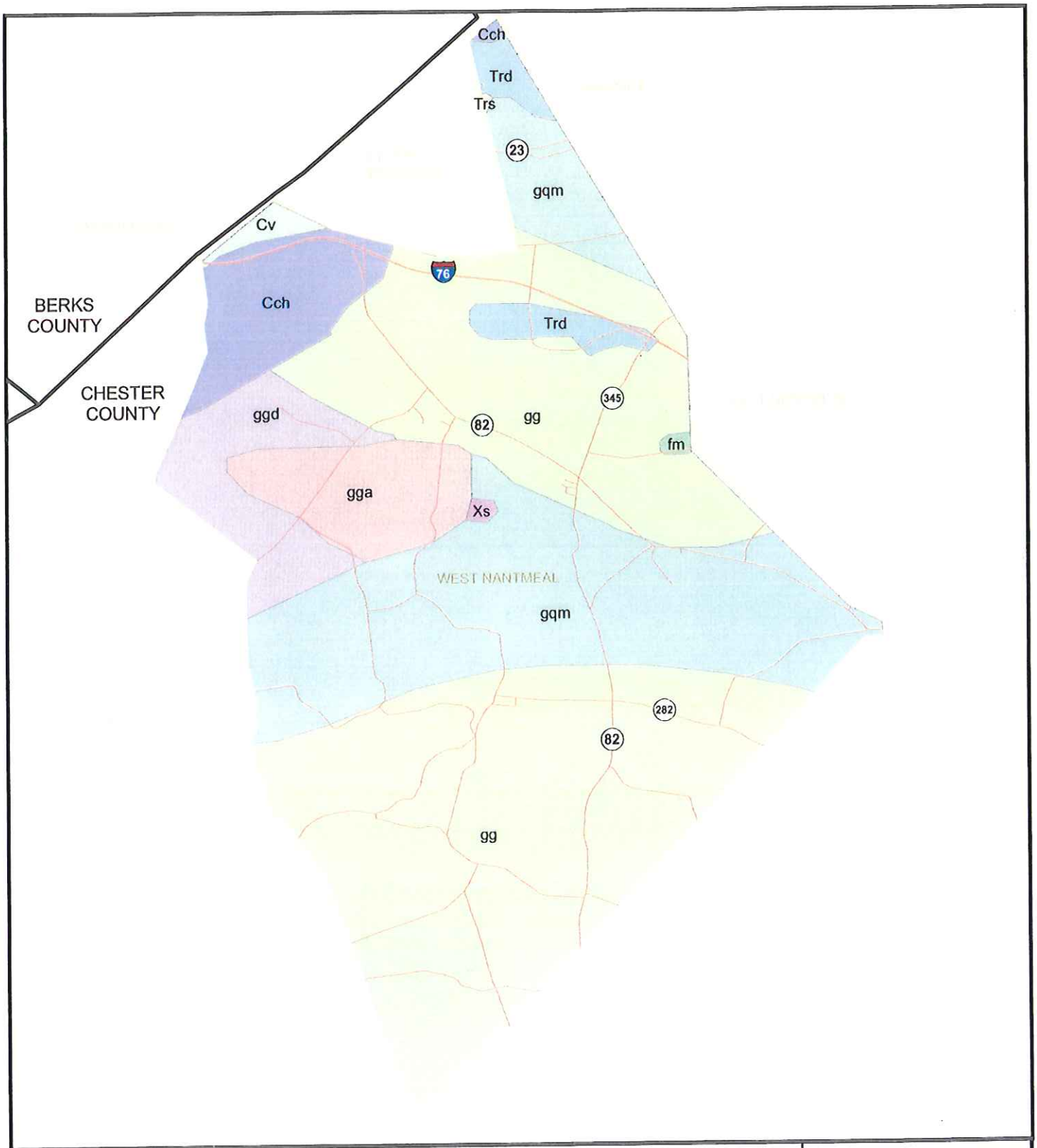
West Nantmeal Township is a community of approximately 2000 residents situated in northwestern Chester County. The Townships of East Nantmeal, Honey Brook, Wallace, Warwick, and West Brandywine, and the Borough of Elverson in Chester County border West Nantmeal. A portion West Nantmeal's northern border lies adjacent to the Township of Caernarvon in Berks County. **Figure 1** shows the location of the Township within its regional context.

This primarily rural Township is approximately 13.5 square miles in area and has a population density of 151 persons per square mile. According to the 2000 census, there were 745 housing units in the Township with a housing density of 55.5 units per square mile. In comparison, Chester County's average population density is 573 persons per square mile and 217 housing units per square mile.

West Nantmeal was created when the Township of Nantmeal was divided into East Nantmeal and West Nantmeal in 1739. In 1789 to the Township of Honey Brook was subdivided from West Nantmeal. Finally in 1853, the Township of Wallace was subdivided from West Nantmeal. The word "Nantmeal" is Welsh in origin, meaning sweet water or land of the sweet stream. It was named by early Welsh settlers who were reminded of their homes in Wales by the rolling hills and water of the Brandywine and French Creeks.

3.1.2. Transportation Corridors

West Nantmeal is accessible via a number local and collector roadways as shown on **Figure 2**. The most prominent roadway within the Township is the Pennsylvania Turnpike (Interstate 76), which crosses the Township in an east-west direction at its northern end. Although there are no interchanges within the Township, the Morgantown



West Nantmeal Township
Chester County, PA

PA Act 537
Sewage Facilities Plan

Figure 4
Surface Geology

Legend

County Boundary
Township Boundary
Major Road

Surface Geology

Cch	Chickies Formation
Trd	Diabase
fm	Franklin Marble
gga	Gabbroic Gneiss and Gabbro
gg	Granitic Gneiss
ggd	Granodiorite and Granodiorite Gneiss
gqm	Quartz Monzonite and Quartz Monzonite Gneiss
Xs	Serpentine
Trs	Stockton Formation
Cv	Vintage Formation

Source:
Pennsylvania Spatial Data Access,
Chester County Geographic
Information Systems

Scale: 1" = 4000'

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Miles
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September, 2004

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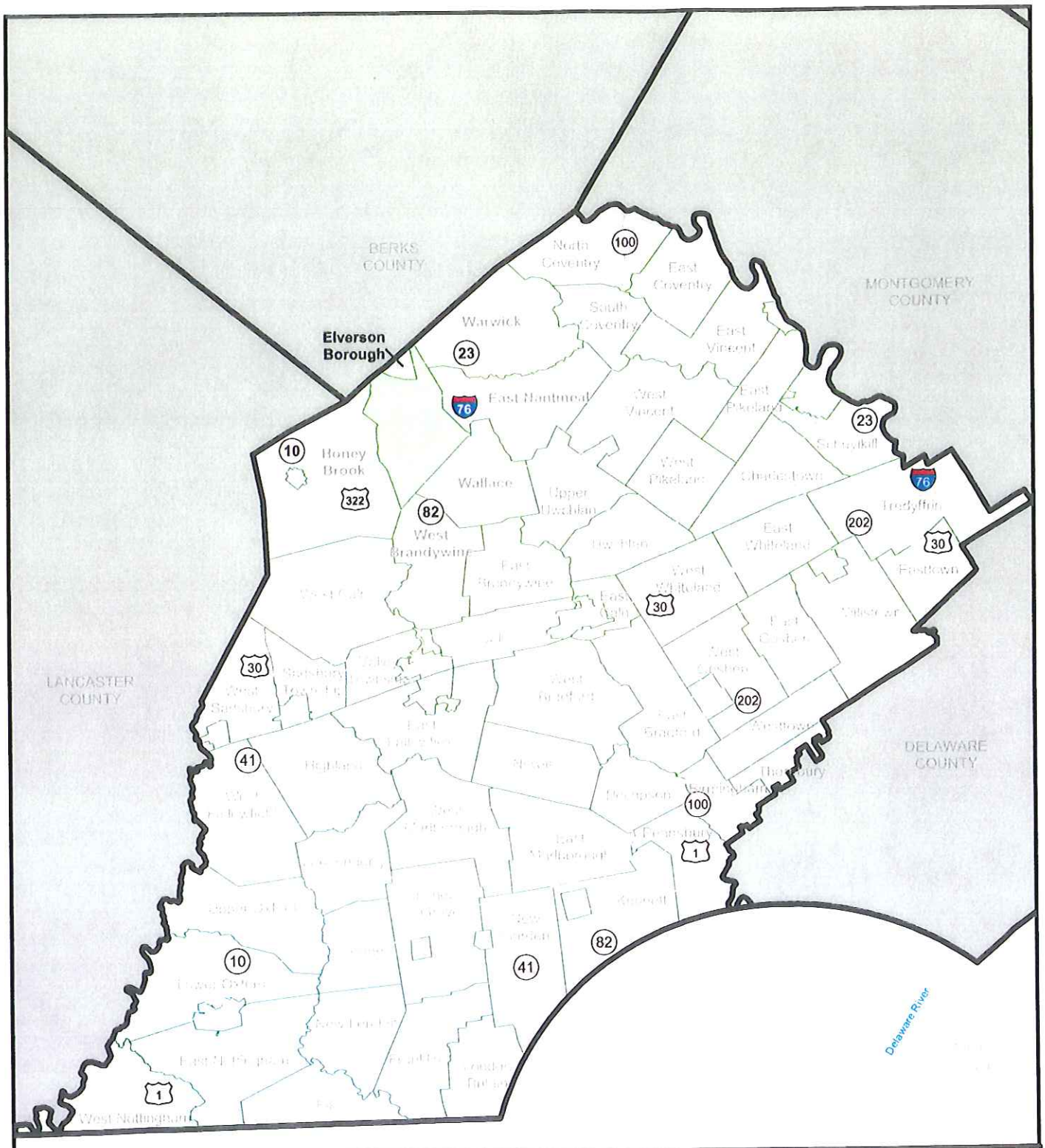

West Nantmeal Township
Chester County, PA

PA Act 537
Sewage Facilities Plan

Figure 1
Context Map

Legend

- Other County
- Chester County
- Major Road
- Other Township Boundary
- West Nantmeal Township
- New Jersey & Delaware

Sources:
Pennsylvania Spatial Data Access,
Gannett Fleming

Scale: 1" = 28,000'

Miles
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Gannett Fleming Sept., 2004

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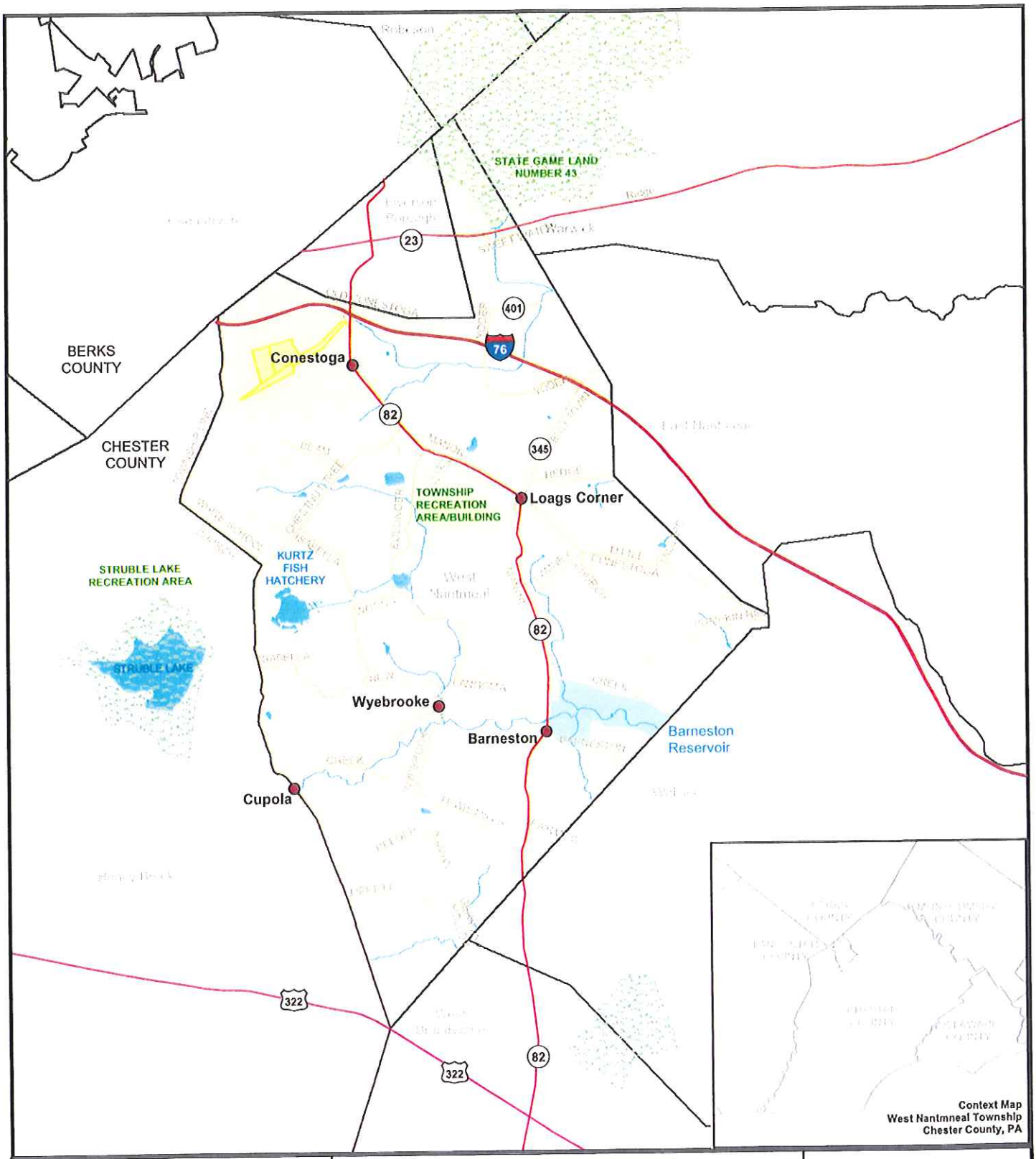

West Nantmeal Township
Chester County, PA

PA Act 537
Sewage Facilities Plan

Figure 2
Study Area

Legend

- Major Road
- Street
- Railroad
- Waterway
- Chester County Water Resources Authority Owned Land
- Chester County Owned Land
- Park
- West Nantmeal Township
- Other Township
- County
- Villages

Source:
Pennsylvania Spatial Data Access,
Chester County Geographic Information Systems

Scale: 1" = 5000'

Miles
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Gannett Fleming Sept. June 2004

Most of the graphic information depicted in this Study was derived from Chester County GIS sources, as revised by local reviews. Certain demographic and utility use projections were

interchange (Exit 298), is only 2 miles west of the Township. No major arterials pass through the Township, although US Route 322 abuts the Township at its southern end. PA Route 23 (Ridge Road), classified as a minor arterial, crosses the Township at its far northern end, intersecting with PA Route 82 in Elverson Borough.

PA Route 82 is a major collector roadway and traverses the entire Township in a north-south direction. Route 82, also known as North Manor Road is the primary location for commercial uses within the Township. Intersecting with PA Route 82 are a number of local roadways such as Route 345 (Bulltown Road), Route 401 (Old Conestoga Road) and Route 282 (Creek Road), Little Conestoga Road, and Chestnut Tree Road.

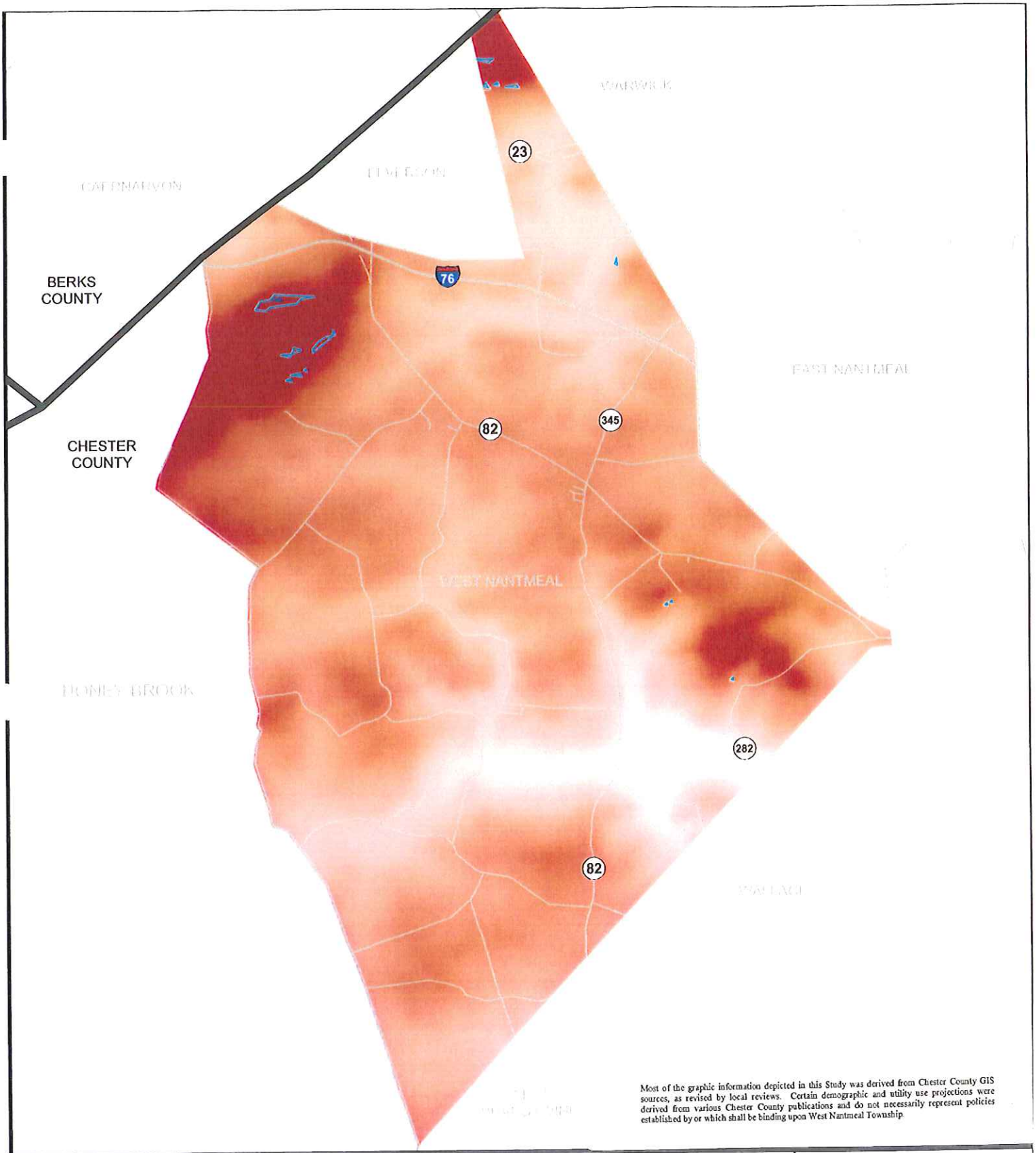
3.1.3. Natural Features

The following information summarizes various environmental features of the West Nantmeal planning area. It is important to understand the area's natural resources and environmental constraints in land use planning and construction activities. The following section includes summaries of the Township's geologic and topographic characteristics, soils and ground and surface water resources, land uses, and conservation areas. Each will be described in the context of the Act 537 planning process.

Topography

The Township is located in the Piedmont Upland Section of the Piedmont Physiographic Province. The dominant topographic form is broad, gently rolling hills and valleys. Elevations generally range from 445 feet to 1,043 feet above sea level. West Nantmeal is primarily characterized by gently rolling hills, with steeper hills in its northwestern section, near Welsh Mountain.

Slopes within West Nantmeal have been divided into three categories, according to their suitability for development and are mapped on **Figure 3**. The categories are:



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West Nantmeal Township
Chester County, PA

PA Act 537
Sewage Facilities Plan

Figure 3
Elevation and Slope

Legend

Township Boundary

Road

Slope

0 - 14%

15% - 24%

Digital Elevation Map

High : 1043.2 feet

Low : 445.3 feet

Source:
Data derived from elevation from Chester County Geographic Information Systems

Scale: 1" = 4000'

0 0.25 0.5 1 Mi

Gannett Fleming

September, 2

0-14% - Level to Moderately Sloping. This area includes floodplains and is suitable for agricultural and most forms of development. As the slope becomes steeper, the soils tend to become shallower and thus susceptible to erosion.

15-24% - Moderately Steep to Steep. This steeply sloped land is found along stream valleys and near Welsh Mountain. Typical characteristics are shallow soils and rock outcroppings. Due to the severity of the slope, these areas would require special building techniques to preserve the soil stability are therefore not suitable for most development. The erosion potential of slopes over 15% also makes these lands generally unsuitable for agricultural uses.

Over 25% - Severely Steep. This land is severely steep and not suitable for agriculture or construction. These areas are characterized by very shallow soils and rock outcroppings. These lands should be preserved in their natural state.

Geology and Groundwater

The Township is underlain by a number of geologic formations of the Cambrian and Lower Paleozoic eras. The type of formation reveals many different characteristics important in determining construction suitability, such as cut-slope stability, ease of excavation and foundation stability. In addition, geologic formations reveal groundwater characteristics and yields.

The following table highlights the major geologic formations within West Nantmeal Township along with a description of each formation's characteristics.

Figure 4 shows the locations of these various formations within the Township.

Table 1

Geologic Formations of West Nantmeal Township

Symbol	Name	Description	Drainage	Topography	Porosity Permeability	Groundwater
A	Anorthosite	An igneous rock, hard, medium-to coarse-grained, light to dark gray; contains plagioclase feldspar	Good surface drainage	Hills of medium relief; natural slopes are fairly steep and stable	Joint openings produce a secondary porosity of low magnitude; low permeability	The median yield is less than 10 gal/min; yield of 25 gal/min. or more might be obtained from wells properly sited and developed
Cch	Chickies Formation	Strongly metamorphosed sandstone. Hard. Forms ridge lines in northern part of the Township	Good surface drainage	Ridges of medium relief, natural slopes are steep and stable	Interconnected, open joints provide a secondary porosity of very low magnitude; very low permeability	Median yield is 20 gal/min; most water is obtained from the fractured zone of the bedrock near the surface; water levels show a strong seasonal influence; water is soft
Chc	Chickies Formation hellam conglomerate	Same as Cch, except features hellam conglomerate at base				
Ca	Antietam Formation	Light gray metamorphic rock; fine grained	Good surface drainage	Hills of medium to high relief; natural slopes are steep and stable	Joint and cleavage-plane openings provide a secondary porosity of low magnitude; low permeability	Median yield is 20 gal/min; for maximum yield, valleys, fault zones, and other fracture zones are mostly favorable well sites
Cv	Vintage Formation	Metamorphosed sedimentary rock. Dark gray, knotty, argillaceous dolomite having impure, light gray marble at the base	Good surface drainage, little subsurface drainage	Undulating valley of low to medium relief; natural slopes are gentle to moderately steep and stable	Joint and solution openings provide a secondary porosity of moderate magnitude; low permeability	Median yield is 30 gal/min; water is relatively hard. Good water supply for on-lot systems; not adequate for industrial use or public system
Cga	Gabbroic Gneiss Gabbro	Metamorphosed igneous rock. Dark color; medium to fine grained; consists of calcic plagioclase, hypersthene or augite, and up to 30 percent quartz	Good surface drainage	Hills of medium relief and undulating surface; natural slopes are fairly steep to steep and stable	Extremely low primary porosity; joints provide a very low secondary porosity; low permeability	Median yield is 20 gal/min; yields of 36 gal/min or more should be obtainable from wells properly sited and developed

Table 1
Geologic Formations of West Nantmeal Township

Symbol	Name	Description	Drainage	Topography	Porosity Permeability	Groundwater
Gd	Granodiorite	Hard igneous rock. Medium grained; light pink to green; largely quartz, feldspar, and mica; commonly gneissic.	Good surface drainage	Hills; medium relief; natural slopes are fairly steep and stable	Joints produce a secondary porosity of low magnitude; low permeability	Yield of 10 gal/min or less may be expected; yields of 25 gal/min or more may be obtained from wells properly sited and developed
Gg	Pickering Gneiss	Metamorphosed rock. Light to medium gray; includes the minerals quartz, orthoclase, hornblende, biotite, and graphite.	Good surface drainage	Hills; low to medium relief; natural slopes are gentile to moderate and stable	Joints produce a secondary porosity; weathered portion has a moderate porosity; low permeability	Expected yield may be 10 gal/min or less; yields of 35 gal/min or more may be obtained from wells properly sited and developed
Md	Metadiabase	Very hard igneous rock. Dark-greenish-gray to almost black diabase; consists of augite, feldspar, and magnetite; Occurs as dikes in West Nantmeal	Good surface drainage	Generally moderate ridges are associated with dikes	Joint-plane openings provide a very shallow and low secondary porosity; low permeability; effective porosity and permeability exist to 150 ft. in depth	Yields of less than 5 gal/min are common
Gqm	Quartz Monzonite	Hard metamorphic rock. Medium grained, light to dark gray; composed of quartz and feldspar; also contains biotite	Good surface drainage	Uplands of low relief and rolling surface; natural slopes are gentle and stable	Little primary porosity; joints provide a low secondary porosity; low permeability	Median yield is 20 gal/min; highest yields may be obtained from fractured, weathered zone at the top of bedrock; static water levels show strong seasonal influence; water is usually soft and of good quality.
Trd	Diabase	Very hard igneous rock. Mainly dark gray to black, dense, and very fine-grained. Mainly labradorite and augite. Occurs in Pennsylvania primarily as dikes and sheets	Fair surface drainage	Undulating hills of medium relief; natural slopes are moderately steep and stable; dikes form ridges	Joint openings provide a very low secondary porosity; low permeability	Median yield is 5 gal/min; yields are usually obtained from the fractured, weathered zone at the top of bedrock, water levels show strong seasonal influence
Trs	Stockton Formation	Soft, sedimentary rock; type of sandstone; Light-gray to buff coarse-grained, arkosic sandstone; includes red to purplish-red sandstone, shale, and siltstone	Good surface drainage	Undulating valleys of low relief; natural slopes are stable	Primary porosity occurs in weathered portion; joint and bedding plane openings provide a secondary porosity in unweathered rock; high to moderate	Average yield is 130gal/min from arkosic sandstone and 20 gal/min from sale; good quality

Table 1
Geologic Formations of West Nantmeal Township

Symbol	Name	Description	Drainage	Topography	Porosity Permeability total effective porosity and permeability	Groundwater
Xpg	Pegmatite	Coarse, granite, igneous rock. White to brown in color; common minerals are quartz, orthoclase, microline, albite, biotite, and muscovite; Occurs as dikes in West Nantmeal	Good surface drainage	Rolling uplands of low relief; natural slopes are gentle and stable	Fractures provide a very low porosity and permeability	Extremely low yields may be expected; outcrop is too narrow in most places to determine specific yield of pegmatite
Xs	Serpentinite	Moderately hard metamorphosed igneous rock; magnesium-rich rock derived from pyroxenite and peridotite; usually green in color and can be fibrous	Good surface drainage	Undulating hills of low relief having gentle, stable slopes	Secondary porosity of low magnitude; low permeability	Median well yield is 20 gal/min; groundwater is usually btained from fractured, weathered zone at top of bedrock; static water levels show strong seasonal influence

Source: Engineering Characteristics of the Rocks of Pennsylvania, (Geyer and Wilshusen), PA Geological Survey, 1982.

Drainage Basins/Watersheds

As shown on **Figure 5**, West Nantmeal Township lies within two major drainage basins and a number of sub-watersheds. The southern portion of the Township is drained by the Brandywine Creek, which ultimately discharges into the Delaware River in Wilmington, DE. Approximately 79% of the Township lies within the Brandywine sub-basin. The northern portion of the Township lies within the Schuylkill River drainage basin that ultimately discharges into the Delaware River in Philadelphia. Sub-watershed basins include the east branch Brandywine Creek, French Creek, and Conestoga River.

The Brandywine and French Creek are both within the Delaware River Basin, while the Conestoga River flows into the Susquehanna River Basin. This river basin is along the northern border of the Berks-Chester County border.

The Pennsylvania Department of Environmental Protection (DEP) develops water quality standards for all surface waters of the State. These standards consist of both use designations and the criteria necessary to protect these uses. DEP conducts stream use designation evaluations on an ongoing basis, as part of its water quality standards program. These evaluations may be conducted on streams, or stream segments.

All Commonwealth waters are protected for a designated aquatic life use as well as a number of water supply and recreational uses. The use designation is the aquatic life use and include: Warm Water Fishes (WWF), Trout Stocking (TSF), Cold Water Fishes (CWF), and Migratory Fishers (MF). In addition, streams with excellent water quality may be designated High Quality Waters (HQ) or Exceptional Value Waters (EV).

In accordance with PA Code 93.4b, the HQ designation is only given if the surface water meets certain chemical and biological conditions. To qualify as an EV Water, the surface water must meet the conditions for HQ designation plus conditions related to National, State or local significance and be of exceptional ecological significance.

The water quality in an HQ stream can be lowered only if a discharge is the result of necessary social or economic development, the water quality criteria are met, and all existing uses of the stream are protected. Water quality in an EV stream can not be lowered and must be protected at their existing quality.

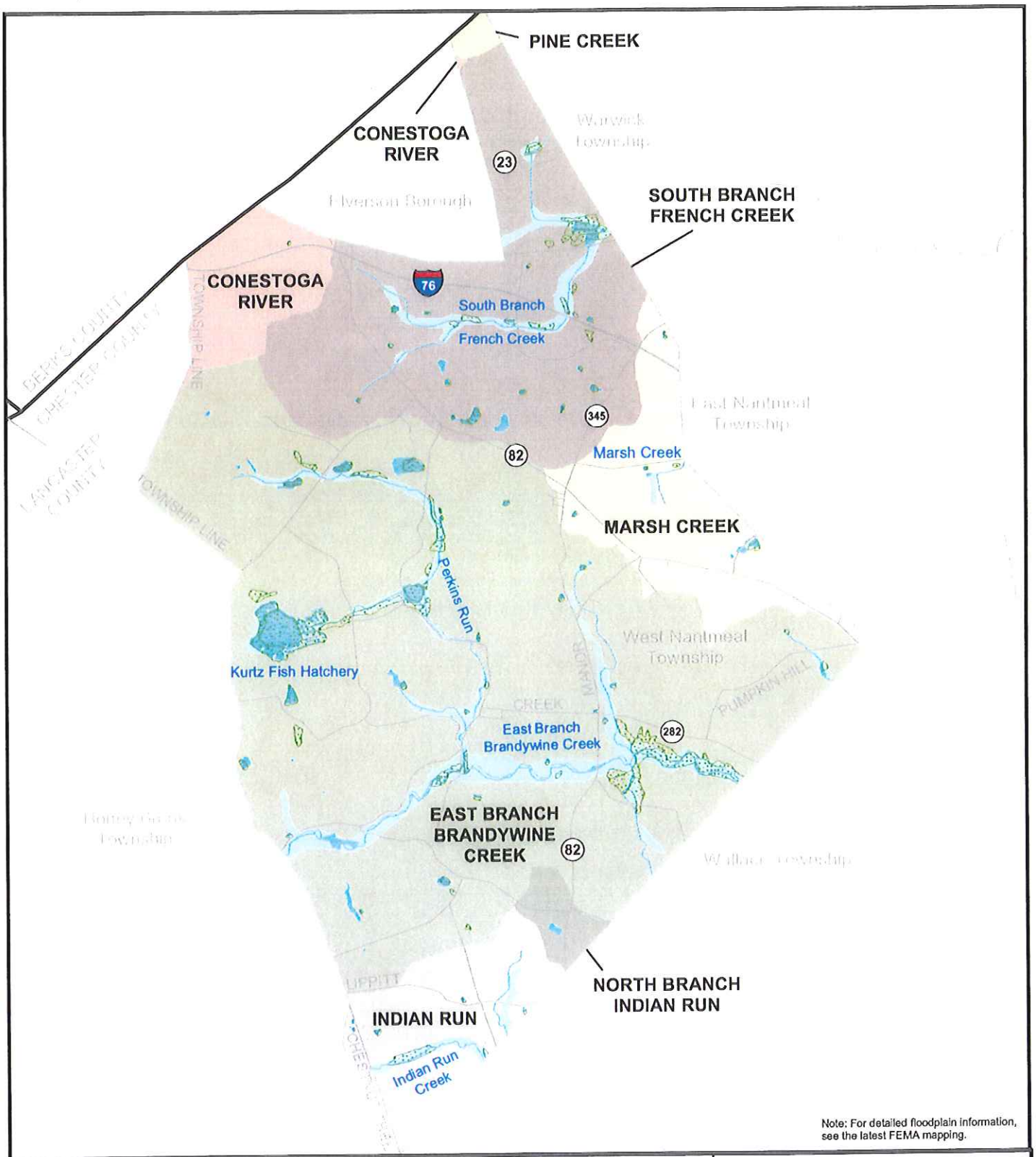
Major streams and tributaries within West Nantmeal Township and their water quality designations are summarized below. Streams of HV or EQ require Subdivisions and Land Developments to utilize enhanced E&S requirements. (See MS4 requirements).

Stream Name	Protected Water Use	Special Protection
East Branch Brandywine Creek	TSF, MF	HQ
Indian Run	CWF	HQ
South Branch French Creek	EV	EV

As indicated above, the French Creek watershed is designated as an Exceptional Value Waters. It is also a Pennsylvania Scenic River. The East Branch Brandywine Creek is designated as High Quality Waters and includes State designated trout streams.

Wetlands/Floodplains and Surface Water

According to the National Wetlands Inventory, there are numerous wetland areas within the Township, mainly along stream banks. Wetlands are characterized by soil characteristics as well as vegetation. They provide valuable water quality and stormwater management functions and can provide habitat areas for many species of plants, birds, and animals. For the most part, wetlands are not suitable for development. The filling of wetlands is permitted only by Federal and State permits, which usually require mitigation and replacement of wetlands lost. The wetland and floodplain areas within the Township are shown on **Figure 5.**



West Nantmeal Township
Chester County, PA

PA Act 537
Sewage Facilities Plan

Figure 5
Water Features

Legend

- County Boundary
- Township Boundary
- Road
- Watersheds
- Pine Creek
- Wetlands
- Conestoga River
- Marsh Creek
- Waterway
- East Branch Brandywine Creek
- North Branch Indian Run
- Floodplain
- South Branch French Creek
- Indian Run

Source:
Pennsylvania Spatial Data Access,
Chester County
Geographic Informations Systems,
National Wetlands Inventory

Scale: 1" = 4000'

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Gannett Fleming Sept. June, 2004

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Soils

Soil classifications and characteristics are extremely important in determining the potential suitability for construction, agriculture, and on-lot sewage disposal systems. **Table 2** summarizes the various soils found within West Nantmeal Township and describes their characteristics with respect to on-lot sewage system suitability. **Figure 6** shows the various locations of soils, based on suitability for on-lot septic systems.

TABLE 2
Soil Classifications and Characteristics
West Nantmeal Township

Symbol	Name and Description	Slope	Erosion	On-lot Suitability	Building Group
BrC3	Brandywine Loam	8 – 15 %	severe	Moderate Limitations	8
BsB	Brandywine Loam, very stony loam	0 – 8 %		severe limitations	7
CdA2	Chester Silt Loam	0 – 3 %	moderate	slight limitations	1
CdB2	Chester Silt Loam	3 – 8 %	moderate	slight limitations	1
CgB	Chester, very stony silt loam	0 – 8 %		slight limitations	5
CgC	Chester, very stony silt loam	8 – 15 %		slight limitations	6
Ch	Chewacla Silt Loam			severe limitations	13
CoA	Conowingo Silt Loam	0 – 3 %		severe limitations	10
EcB	Edgmont, Channery Loam	3 – 8 %		slight limitations	1
EcB2	Edgemont Channery Loam	3 – 8 %	moderate	slight limitations	1
EcC	Edgemont Channery Loam	8 – 15 %		slight limitations	2
EcC2	Edgemont Channery Loam	8 – 15 %	moderate	slight limitations	2
EcC3	Edgemont Channery Loam	8 – 15 %	severe	slight limitations	2
EcD	Edgemont Channery Loam	15 – 25 %		slight limitations	2

TABLE 2
Soil Classifications and Characteristics
West Nantmeal Township

Symbol	Name and Description	Slope	Erosion	On-lot Suitability	Building Group
EcD3	Edgemont Channery Loam	15 – 25 %	severe	slight limitations	2
EdD	Edgemont, very stony loam	8 – 25 %		slight limitations	6
EdF	Edgemont, very stony loam	25 – 60 %		severe limitations	9
GeA	Glenely Channery Silt Loam	0 – 3 %		slight limitations	5
GeA2	Glenely Channery Silt Loam	0 – 3 %	moderate	slight limitations	5
GeB	Glenely Channery Silt Loam	3 – 8 %		slight limitations	5
GeB2	Glenely Channery Silt Loam	3 – 8 %	moderate	slight limitations	5
GeB3	Glenely Channery Silt Loam	3 – 8 %	severe	slight limitations	5
GeC	Glenely Channery Silt Loam	8 – 15 %		slight limitations	6
GeC2	Glenely Channery Silt Loam	8 – 15 %	moderate	slight limitations	6
GeC3	Glenely Channery Silt Loam	8 – 15 %	severe	slight limitations	6
GeD	Glenely Channery Silt Loam	15 – 25 %		slight limitations	6
GeD2	Glenely Channery Silt Loam	15 – 25 %	moderate	slight limitations	6
GeD3	Glenely Channery Silt Loam	15 – 25 %	severe	slight limitations	6
GeE3	Glenely Channery Silt Loam	25 – 35 %	severe	severe limitations	9
GmD	Glenelg, very stony silt loam	15 – 25 %		slight limitations	6
GmE	Glenelg, very stony silt loam	25 – 35 %		severe limitations	9
GnA	Glenville Silt Loam	0 – 3 %		severe limitations	10
GnB	Glenville Silt Loam	3 – 8 %		severe limitations	10
GnB2	Glenville Silt Loam	3 – 8 %	moderate	severe limitations	10

TABLE 2
Soil Classifications and Characteristics
West Nantmeal Township

Symbol	Name and Description	Slope	Erosion	On-lot Suitability	Building Group
GnC2	Glenville Silt Loam	8 – 15 %	moderate	severe limitations	11
GsB	Glenville Very Stony Silt Loam	0 – 8 %		severe limitations	10
Me	Made Land, schist and gneiss material			slight limitations	1
MgB2	Manor Loam	3 – 8 %	moderate	slight limitations	5
MgB3	Manor Loam	3 – 8 %	severe	slight limitations	5
MgC	Manor Loam	8 – 15 %		slight limitations	6
MgC2	Manor Loam	8 – 15 %	moderate	slight limitations	6
MgC3	Manor Loam	8 – 15 %	severe	slight limitations	6
MgD	Manor Loam	8 – 15 %		slight limitations	6
MgD2	Manor Loam	15 – 25 %	moderate	slight limitations	6
MgD3	Manor Loam	15 – 25 %	severe	slight limitations	6
MhE	Manor Loam and channery loam	25 – 35 %		severe limitations	9
MhE3	Manor Loam and channery loam	25 – 35 %	moderate	severe limitations	9
MkF	Manor soils	35 – 60 %		severe limitations	9
MmD	Manor very stony loam	8 – 25%		slight limitations	6
MoB2	Montalto channery silt loam	3 – 8 %	moderate	Moderate Limitations	3
MoC2	Montalto channery silt loam	8 – 15 %	moderate	Moderate Limitations	4
MoC3	Montalto channery silt loam	8 – 15 %	severe	Moderate Limitations	4
NaA	Neshaminy gravelly silt loam	0 – 3 %		Moderate Limitations	3
NaB2	Neshaminy gravelly silt loam	3 – 8 %	moderate	Moderate Limitations	3

TABLE 2
Soil Classifications and Characteristics
West Nantmeal Township

Symbol	Name and Description	Slope	Erosion	On-lot Suitability	Building Group
NaC2	Neshaminy gravelly silt loam	8 – 15 %	moderate	Moderate Limitations	4
NaC3	Neshaminy gravelly silt loam	8 – 15 %	severe	Moderate Limitations	4
NaD3	Neshaminy gravelly silt loam	15 – 25 %	severe	Moderate Limitations	4
NsB	Neshaminy very stony silt loam	0 – 8 %		Moderate Limitations	3
NsD	Neshaminy very stony silt loam	8 – 25%		Moderate Limitations	4
We	Wehadkee	Floodplain		severe limitations	13
WoA	Worsham silt loam	0 – 3 %		severe limitations	12
WoB	Worsham silt loam	3 – 8 %		severe limitations	12
WoB2	Worsham silt loam	3 – 8 %	severe	severe limitations	12
WsB	Worsham very stony silt loam	0 – 8 %		severe limitations	12

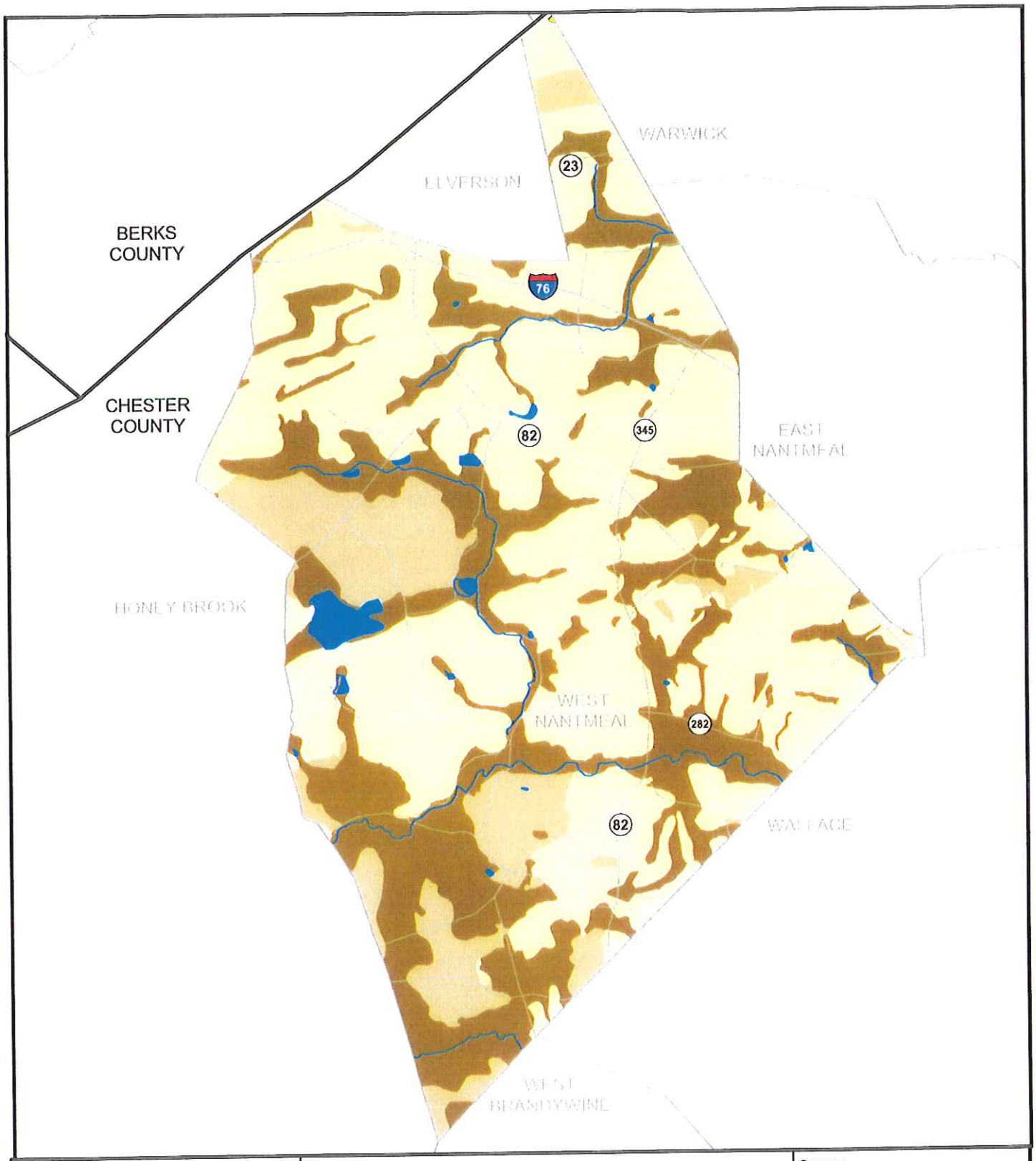
Source: Soil Survey Chester County Pennsylvania, USDA, Soil Conservation Service

In order for a soil to be categorized as "generally suitable for in-ground sewage disposal systems", the limiting zone (mottling, or other indications of a seasonal high water table, bedrock or any other property that may hinder the renovation of effluent by the soil) must be 60 inches or greater from the mineral soil surface and the soil must have a slope of 8 percent or less and a permeability in the range of 6-90 minutes per inch.

To be categorized as "generally suitable for an elevated sand mound", the limiting zone must be 20 inches or greater from the soil surface and the soil must have a slope of 25 percent or less and a permeability of 3-120 minutes per inch.

If a soil was found to have a slope greater than 25 percent, a limiting zone at a depth less than 20 inches below the mineral soil surface, or a permeability less than 6 or greater than 120 minutes per inch, the soil was categorized as generally unsuitable for on-lot sewage disposal systems.

If an area falls under the category of 'generally unsuitable for on-lot sewage disposal systems', it does not necessarily imply that the soil may not be used as such; it merely indicates that the soil is poorly suited. Due to the sometimes wide range of characteristics within each soil series, and within the individual mapping unit as described in the Soil Survey of Chester County, the categories listed should be considered as a generalization only. Soil suitability for a specific site. This is also important because of the possibility of local inclusions of soil that are not delineated in the soil survey.



West Nantmeal Township
Chester County, PA

PA Act 537
Sewage Facilities Plan

Figure 6
Soils Suitability

Legend

- County Boundary
- Township Boundary
- Waterway
- Road

Soils: On-Lot Suitability

- Slight Limitations
- Moderate Limitations
- Severe Limitations

Source:
Pennsylvania Spatial Data Acess,
Chester County
Soil Conservation Service,
US Department of Agriculture, May 1963

Scale: 1" = 4000'

Miles
0 0.25 0.5 1

Gannett Fleming Sept. ~~June~~ 2004

Most of the graphic information depicted in this Study was derived from Chester County GIS sources, as revised by local reviews. Certain demographic and utility use projections were derived from various Chester County publications and do not necessarily represent policies

Land Use

Existing land use in the Township includes a mixture of residential, agricultural, commercial, industrial, and woodlands. Residential uses include multi-family, mobile homes, and single-family dwellings. As shown on **Figure 7**, agricultural represents the highest percentage of land use, followed by woodlands and single-family residential.

Table 3 summarizes the various percentages of land uses in the Township.

TABLE 3

Percentage of Land Use - West Nantmeal Township

	1976	1987
Agriculture	61.7%	54.1%
Woodlands	30.8%	30.8%
Residential	6.2	7.1
Vacant	0.2	4.7
Transportation	___	1.9
Public and Institutional	0.6	1.0
Commercial	0.1	0.2
Industrial	0.4	0.2

Sources: West Nantmeal Comprehensive Plan (1987), Chester County Information Services, 2000.

Conservation Areas and Managed Lands

The following section describes various land conservation and management programs designed to assist property owners in preserving or protecting valuable land resources from development. A number of property owners within West Nantmeal Township participate in these programs. Land currently within these programs is effectively removed from development. **Figure 8** shows the areas within the Township under the various management or conservation programs.

Act 43 - Agricultural Area Security Law

Agricultural Security Area (ASA) designation helps ensure that a farmer can continue using the farmland in productive use. Municipalities use the ASA as a tool for strengthening and protecting high quality farmland from urbanization. The program is voluntary for farmers who petition the Township Supervisors to create the ASA. The minimum required for ASA protection is 250 acres. If the ASA has at least 500 acres, the land may qualify for consideration under the Agricultural Easement Program.

The Agricultural Easement Program

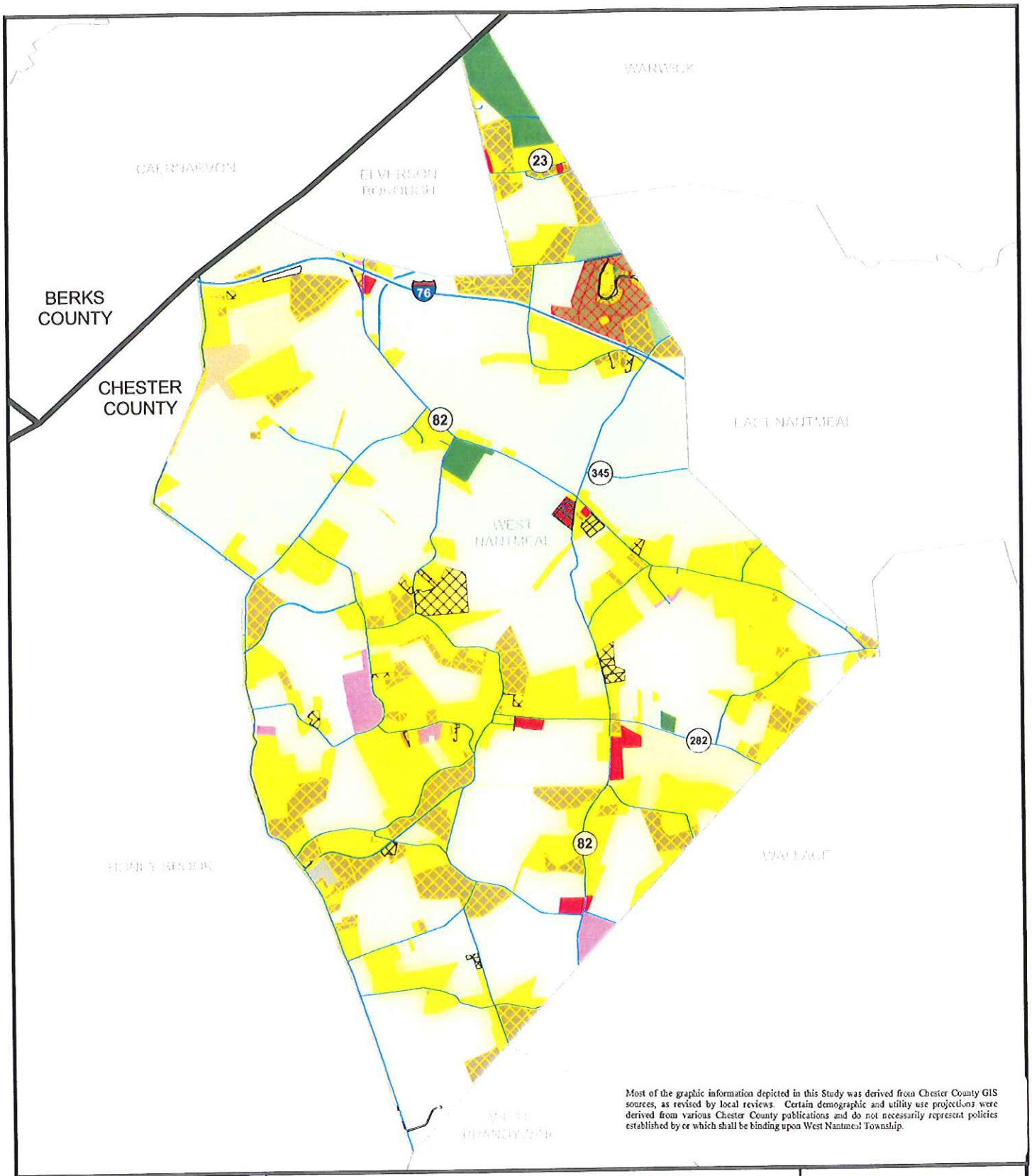
The Pennsylvania Agricultural Conservation Easement Purchase Program was developed in 1988 to help slow the conversion of prime farmland to non-agricultural uses. The program enables State, County, and local governments to purchase conservation easements (a.k.a. development rights) from farmland owners. There are a number of qualifying criteria for the program. The money gained by the easement sale is either paid in a lump sum, or over a 5 year or longer term payment schedule. As of July 1, 2002, over 1,066 acres have been purchased within West Nantmeal Township. See **Figure 8.**

Act 319 - "Clean and Green"

The Clean and Green Act of 1974 allows land to be taxed according to its use, rather than by market value. This voluntary program usually requires a minimum of 10 acres. Landowners participating in the program realize reduced taxes as long as the property remains in agricultural use or in forest or agricultural reserve. Land within an Act 319 can be removed; however landowners would be subject to rollback taxes and interest penalties.

State Game Lands

Approximately 90 acres within West Nantmeal Township are currently part of State Game Land #43. This area is located in the far northeastern section of the Township, adjacent to its border with Berks County.



West Nantmeal Township
Chester County, PA

PA Act 537
Sewage Facilities Plan

Figure 7
Existing Land Use

Legend

- County Boundary
- Township Boundary
- Major Road

Land Use

- Commercial
- Commerical: Mobile Home Park
- Chester County Property
- Woods
- Golf Course
- Farm
- Industrial
- Public Utility
- Community Facility
- Railroad
- Local Government Park
- Residential
- Mixed Use (Commercial)
- Residential: Mobile Homes
- Vacant Residential
- Vacant Commercial
- Vacant Open Space
- Vacant ROW, Access Way

Source:
Chester County Geographic Information Systems

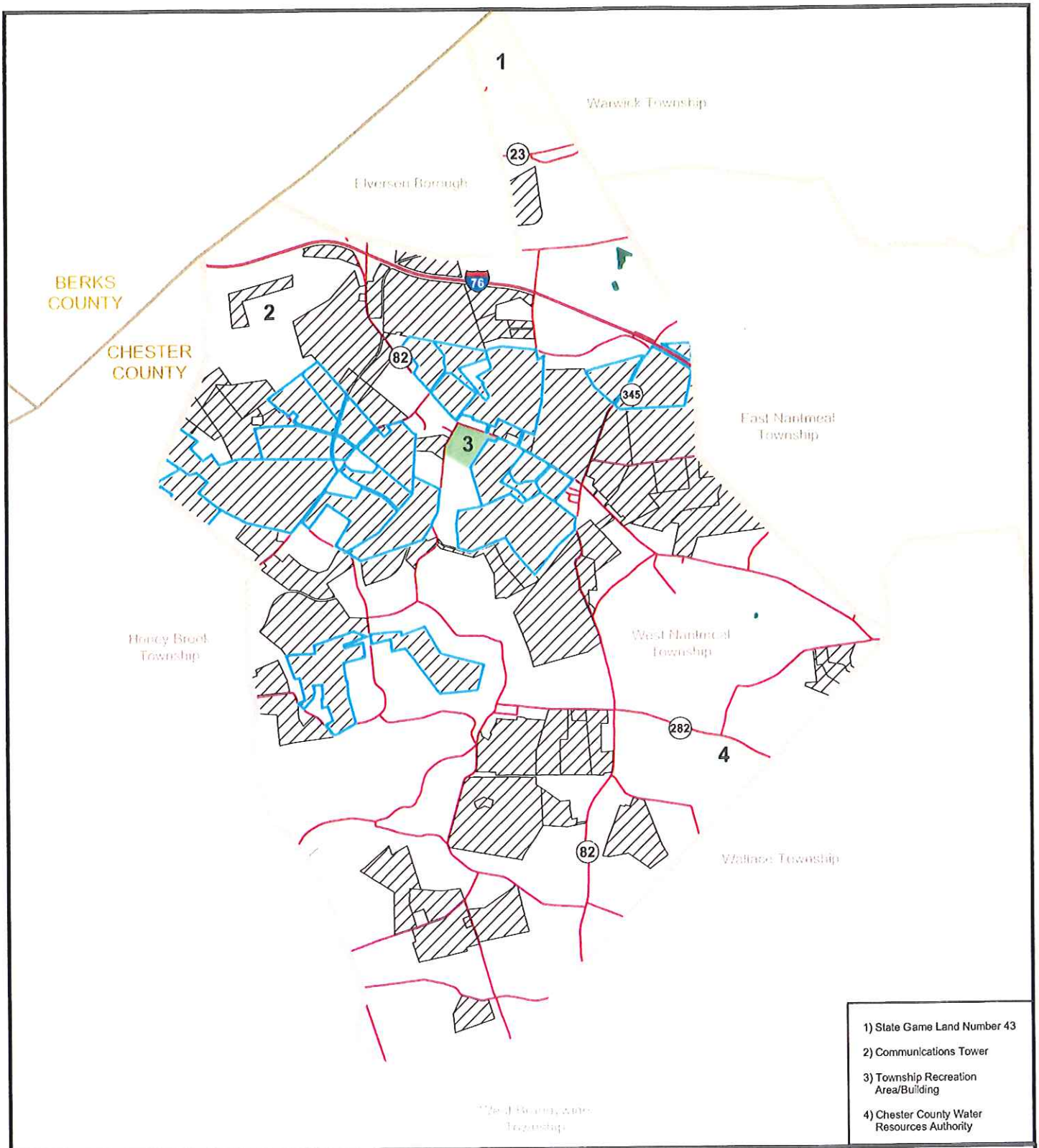
Scale: 1" = 4000'

N
W E
S

0 0.25 0.5 1 Miles

Gannett Fleming

September, 2004



West Nantmeal Township
Chester County, PA

PA Act 537
Sewage Facilities Plan

Figure 8
Managed and
Protected Lands

Legend

- County Boundary
- Township Boundary
- Road
- Parcel
- Agriculture Security
- Agricultural Easement
- Township Park
- Open Space
- County Land
- Managed Land

Source:
Chester County Geographic Information Systems,
West Nantmeal Township

Scale: 1" = 4000'

N
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Miles
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Gannett Fleming Sept. ~~June~~ 2004

Most of the graphic information depicted in this Study was derived from Chester County GIS sources, as revised by local reviews. Certain demographic and utility use projections were

3.2. Population and Wastewater Flow History

This section will examine historic trends in both population and housing growth from 1970 to present. This evaluation will be based on a review of US Census data from these years, as well as additional information provided by the Township.

Population Trends

Over the past 30 years, West Nantmeal Township has seen its population increase from 1,285 to 2,031, an increase of 58 percent. The Township's largest growth spurt was between 1970 and 1980 when the population increased by 37% over the previous decade. However, over the last 20 years, growth has slowed. Between 1990 and 2000, for example, the Township increased its population by only 3%.

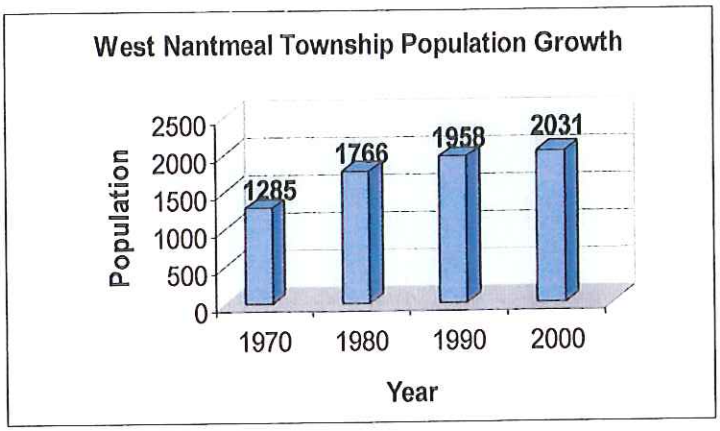


Figure 9

Table 4 summarizes the population growth for West Nantmeal and its surrounding communities. As a comparison, data for Chester County and Pennsylvania is also presented in this table. West Nantmeal is adjacent to many growing municipalities within both Chester County and Berks County. As summarized in **Table 4**, and graphically portrayed in **Figure 10**, Many of West Nantmeal's neighboring communities have seen their populations increase dramatically since 1970. However, nearly all have had similar decreases in their rate of growth in the previous decade of 1990-2000. The only exception was Elverson Borough, which doubled its population between 1990 and 2000.

Table 4

Population Change for the West Nantmeal Township Region, 1970-2000

Municipality	Total Population				Population Change			
	1970	1980	1990	2000	1990-2000		1970-2000	
					#	%	#	%
Pennsylvania	11,800,766	11,864,720	11,882,842	12,281,054	398212	3.4	480288	4.1
Chester County	277746	316,660	376,396	433501	57105	15.2	155755	56.1
West Nantmeal Township	1285	1766	1958	2031	73	3.7	746	58.1
CONTIGUOUS MUNICIPALITIES	11657	15881	20418	24285	3867	18.9	12628	108.3
Caernarvon Twp (Berk Co.)	1680	1780	1951	2312	361	18.5	632	37.6
East Nantmeal Township	858	1222	1448	1787	339	23.4	929	108.3
Elverson Borough	509	530	470	959	489	104.0	450	88.4
Honeybrook Township	2883	4128	5449	6278	829	15.2	3395	117.8
Wallace Township	1347	1881	2541	3240	699	27.5	1893	140.5
Warwick Township	1667	2350	2575	2556	-19	-0.7	889	53.3
West BrandywineTownship	2713	3990	5984	7153	1169	19.5	4440	163.7

Source: US Census Bureau, 1990, 2000 West Nantmeal Township Comprehensive Plan, 1987

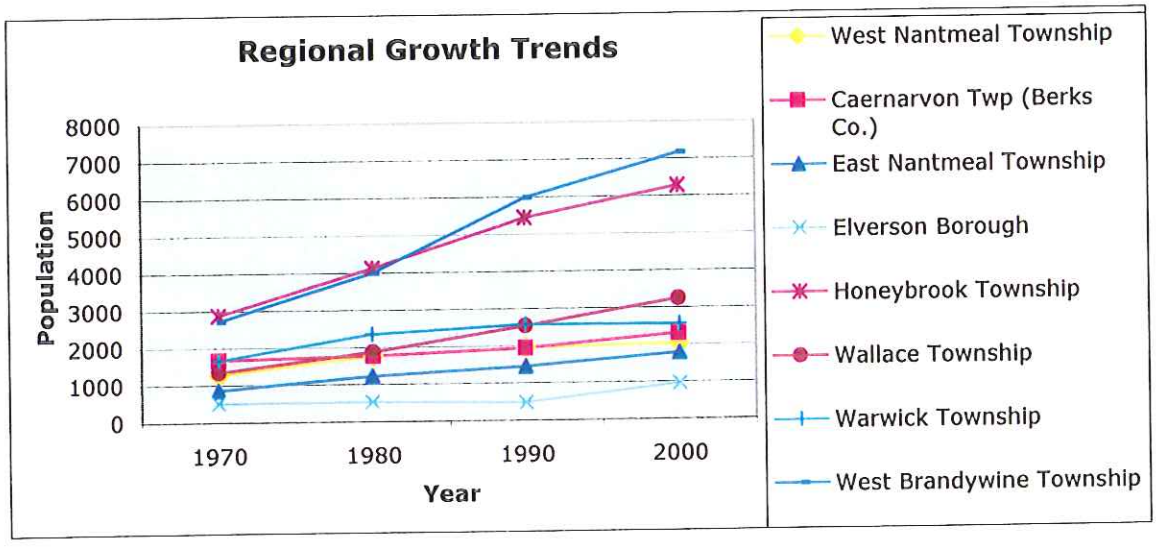


Figure 10

Housing Unit Growth

A review of housing unit growth trends also correlates with the population data noted above. Elverson Borough's large increase in population (104%) coincides with a large percentage increase in housing units (156%) as shown on **Figure 11**. West Nantmeal's housing growth outpaced its population growth during the last decade, similar to nearly all of the surrounding municipalities. This suggests that on average, household sizes are becoming smaller. This reflects State and nationwide trends which also tend to reflect decreasing household size.

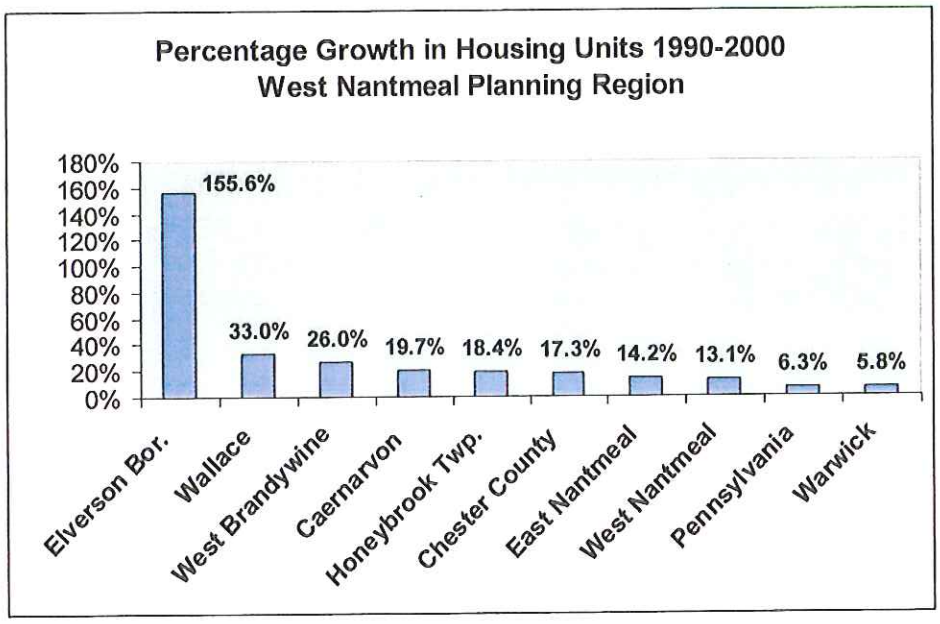


Figure 11

Housing Trends

Housing unit characteristics are also an important indicator of the existing character of the area. Particular emphasis is placed upon data such as housing unit growth, average household size, age of housing units and type of housing units. These statistics can provide vital information regarding the potential for unpermitted or unregulated sewage disposal systems and help identify future trends.

Characteristics of Housing Units

The typical housing unit in West Nantmeal is the single family dwelling. As shown on **Figure 12,** over 77% of the total housing units in the Township are in this category. The second largest category is mobile homes, which comprise over 14% of the housing stock. These statistics provide insight into the types of possible on-lot sewage systems in use.

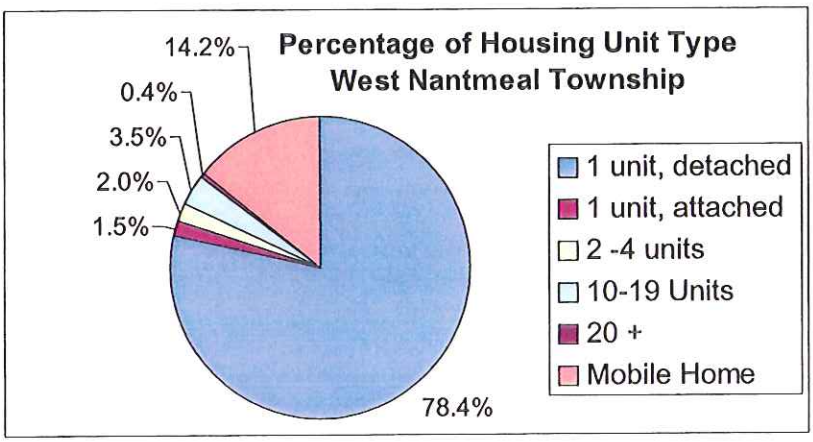


Figure 12

Another important indicator of the types and condition of on-lot systems is the age of the units. Although many older homes may have upgraded their original systems, it is possible that older units still use systems, which are either out-dated or currently not permitted. As shown on **Figure 13**, the highest percentage of units in the Township were constructed between 1990 and 2000. However a large percentage were constructed prior to 1970 (55.5%) when new on-lot permitting requirements were established.

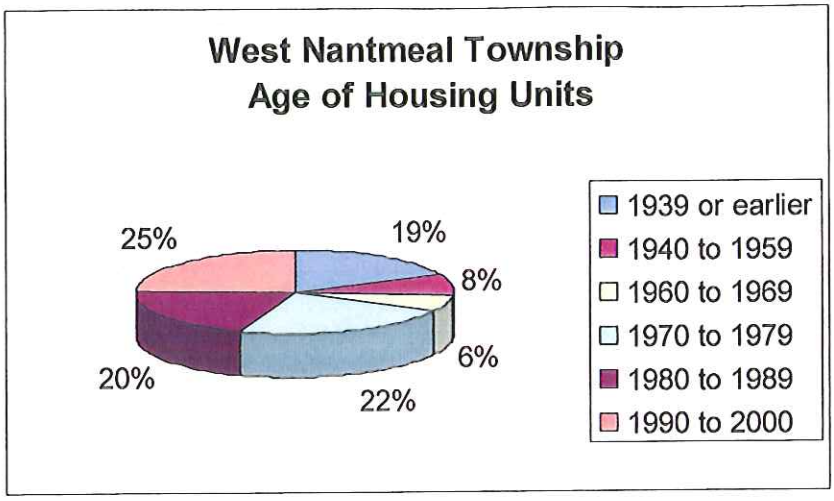


Figure 13

Table 5
Age of Housing Units
West Nantmeal Township

Municipality	Year Structure Built						Total Housing Units
	1939 or earlier	1940 to 1959	1960 to 1969	1970 to 1979	1980 to 1989	1990 to 2000	
West Nantmeal Township	138	61	48	167	148	183	745
% of total	18.50%	8.20%	6.44%	22.40%	19.90%	24.56%	

Source: US Census Bureau, 2000

Despite increasing population, West Nantmeal has maintained its rural character. Large tracts of managed land, including State Game Lands and those under conservation protection, combined with the rolling topography and abundant agricultural lands define the visual quality of the community. A comparison of population densities shows that West Nantmeal's current population density is 151 persons per square mile which is low, when compared to the County wide average of 573 persons per square mile. It has one of the lowest population densities in the region, as shown on **Figure 14.**

Another indicator of density is measured by housing units per square mile. As summarized on **Table 6,** West Nantmeal's housing unit density is approximately 55.5 housing units per square mile, compared to the county wide average of 216 housing units per square mile.

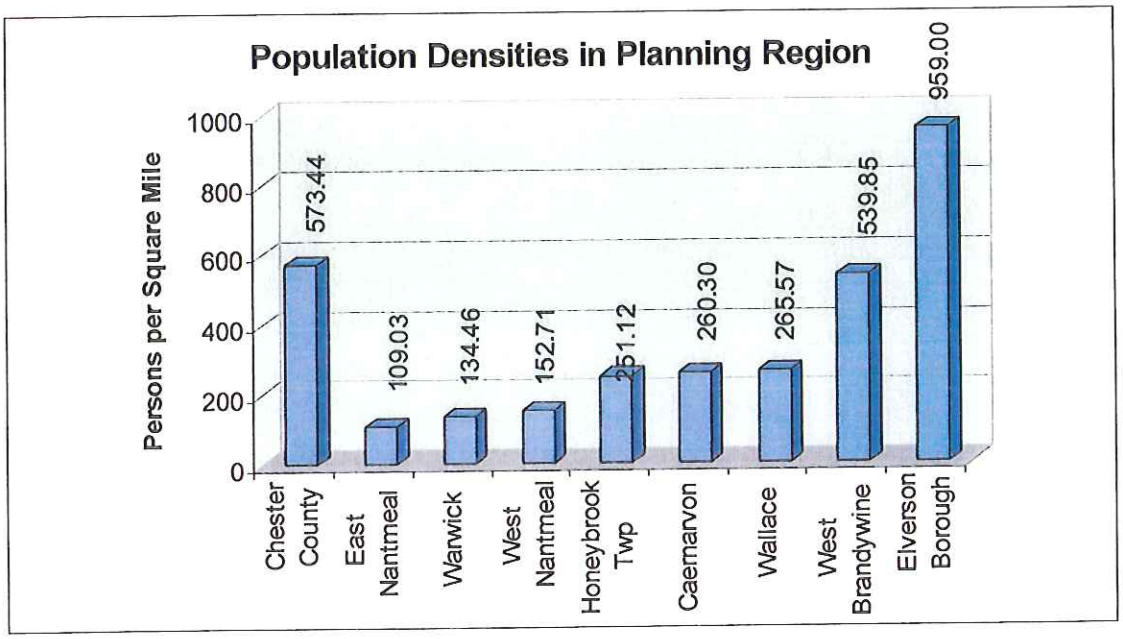


Figure 14

Table 6
Housing Unit Density, 1990-2000

Municipality	Land Area (Sq. Mi.)	Housing Units Per Square Mile		Numeric Change
		1990	2000	1990-2000
Pennsylvania	44,819.6	110.2	117.1	7.0
Chester County	755.97	184.7	216.6	31.9
West Nantmeal Township	13.3	49.5	55.5	6.5
CONTIGUOUS MUNICIPALITIES	95.73	59.4	91.9	32.5
Caernarvon Twp (Berks Co.)	8.88	87.0	104.2	17.1
East Nantmeal Township	16.39	31.4	35.8	4.5
Elverson Borough	1	180.0	460.0	280.0
Honeybrook Township	25	72.1	85.4	13.3
Wallace Township	12.2	63.9	85.7	21.7
Warwick Township	19.01	51.3	54.3	3.0
West Brandywine Township	13.25	49.7	197.0	147.2

Source: U.S. Census Bureau

4.0 Planning History and Growth Objectives

4.1. Wastewater Planning

A number of past and present sewage facilities documents were reviewed to determine their affect upon the Township and its service areas. Past documents include the County Sewerage Plan of 1970 and the Water Resources Inventory-Brandywine Sub-Basin of 1979. Currently approved Act 537 Plans in the Township and its adjacent communities were also reviewed.

1. Past Documents

Master Sewer Plan, Revised Edition, 1970
For Chester County, PA
Existing 1968-78, 1978-88
Prepared by Roy F. Weston for Chester County Planning Commission

The Master Sewer Plan was drafted for the Chester County Planning Commission to serve communities without official wastewater facilities plans. This plan has served as the guidance for West Nantmeal Township. The plan's purpose and objectives are noted below.

- "To prepare an official comprehensive plan for municipal, or public type domestic sewerage systems which should be developed, in addition to present systems, to adequately serve the present and probable future needs of Chester County."

- "Delineate areas in which community sewage systems are in existence and evaluate their potential for increasing service."

- "Delineate areas where sewage systems are planned to be available within a 10 year period."

This Master Sewer Plan identified West Nantmeal as part of the "Honeybrook" Sub-region. The plan indicated that this particular sub-region would have the least population gains in comparison to others in the Chester County.

The plan describes the proposed municipal wastewater system in Elverson Borough which was to be located on the French Creek within West Nantmeal. The plan projected that this facility would have 1,100 connections by 1980 (0.11 mgd) and 3,300 connections by 1988 (0.33 mgd). The plan did not anticipate that the Borough system would extend into West Nantmeal. (NOTE: Elverson's treatment facility was eventually located within the Borough and not in West Nantmeal.)

The Master Sewer Plan projected that there would be no existing or future sewered areas within West Nantmeal Township by 1988.

Since the planning period expired in 1988, this County Master Sewer Plan is viewed as obsolete for the current or future needs of the West Nantmeal Township.

Water Resources Inventory Study
A Joint Project of the Chester County Water Resources Authority and Chester County Planning Commission
1979 - Volume K, Brandywine Sub-Basin

This inventory reviewed the various water resources by specific sub-basin. West Nantmeal Township is located within a number of sub-watershed areas, the largest of which is the East Branch of the Brandywine Creek. There are 6,744 acres in the watershed. Overall, the percentage of the total sub-watershed in West Nantmeal is 8.5%.

The plan describes various alternatives to deal with water supply shortages /wastewater disposal as listed below.

1. Stormwater Management Practices
2. Groundwater Recharge
3. Conservation
4. Higher Levels of Wastewater Treatment
5. Export to other watersheds
6. Import water supplies

Only the top three alternatives were considered viable.

2. Present Sewage Facilities Planning

The following Sewage Facilities Plans were reviewed at the offices of the Chester County Planning Commission and Pennsylvania Department of Environmental Protection. The majority of plans reviewed had no specific mention of extending service areas to West Nantmeal Township.

East Nantmeal Township

Act 537 Plan
East Nantmeal Township
Adopted August 1, 1996 and Accepted by the DEP 12/23/99
Prepared by The Grafton Association

Elverson Borough

Act 537 Wastewater Facilities
Plan Update Revision
Borough of Elverson, Chester County, PA

June 2002
Prepared by Spotts, Stevens, and McCoy, Inc.

Act 537
Elverson Borough
March 1999
Prepared by Tatman and Lee

Comprehensive Revision to Wastewater Facility Plan
Elverson Borough
Last Revised November 1992
Prepared by Tatman and Lee

This plan specifically notes the potential for offering sewer service to West Nantmeal. However, West Nantmeal declined service.

Honeybrook Township

Honeybrook Township, Chester County
Update Act 537 Wastewater Facilities Plan
October 1995
Prepared by SMC Environmental Services Group

Wallace Township

Glenmore Wastewater Management Plant
Wallace Township Municipal Authority
Act 537 Sewage Facility Plan Special Study
April 2001, revised June 2001
Prepared by URS Corporation

Act 537 Sewage Facility Plan Special Study
Glenmore Wastewater Management Facility
Wallace Township
June 5, 1997
Prepared by Tatman and Lee

Wallace Township – Sewage Facilities Plan Update
Wastewater policy and management document
August 1995
Address the need to service the Village of Glenmore.

Warwick Township

Warwick Township Act 537 Plan (Phase III)
July 9, 2000
Prepared by Tatman and Lee
Study Areas were St. Mary's, St. Peters Village, and the other remaining areas.

West Brandywine Township

West Brandywine Township – Act 537 Plan
April 1, 1993, revised May 12, 1994, and revised April 19, 1996
Prepared by Yerkes Associates, Inc.
No mention of West Nantmeal Township

Nantmeal-Warwick Sewer Service Area

The following Planning Module addressed the extension of sewer service to a portion of West Nantmeal Township. The PA DEP approved the module in August 2001.

Revision to the Official Wastewater Facilities Plans For: West Nantmeal Township, East Nantmeal Township, Elverson Borough, and Warwick Township Chester County, Pennsylvania for the proposed Nantmeal-Warwick Sewer Service Area.

August 25, 2000

Latest Revision, November 22, 2000

Prepared for Stoltzfus Enterprises, Inc. by URS Corporation

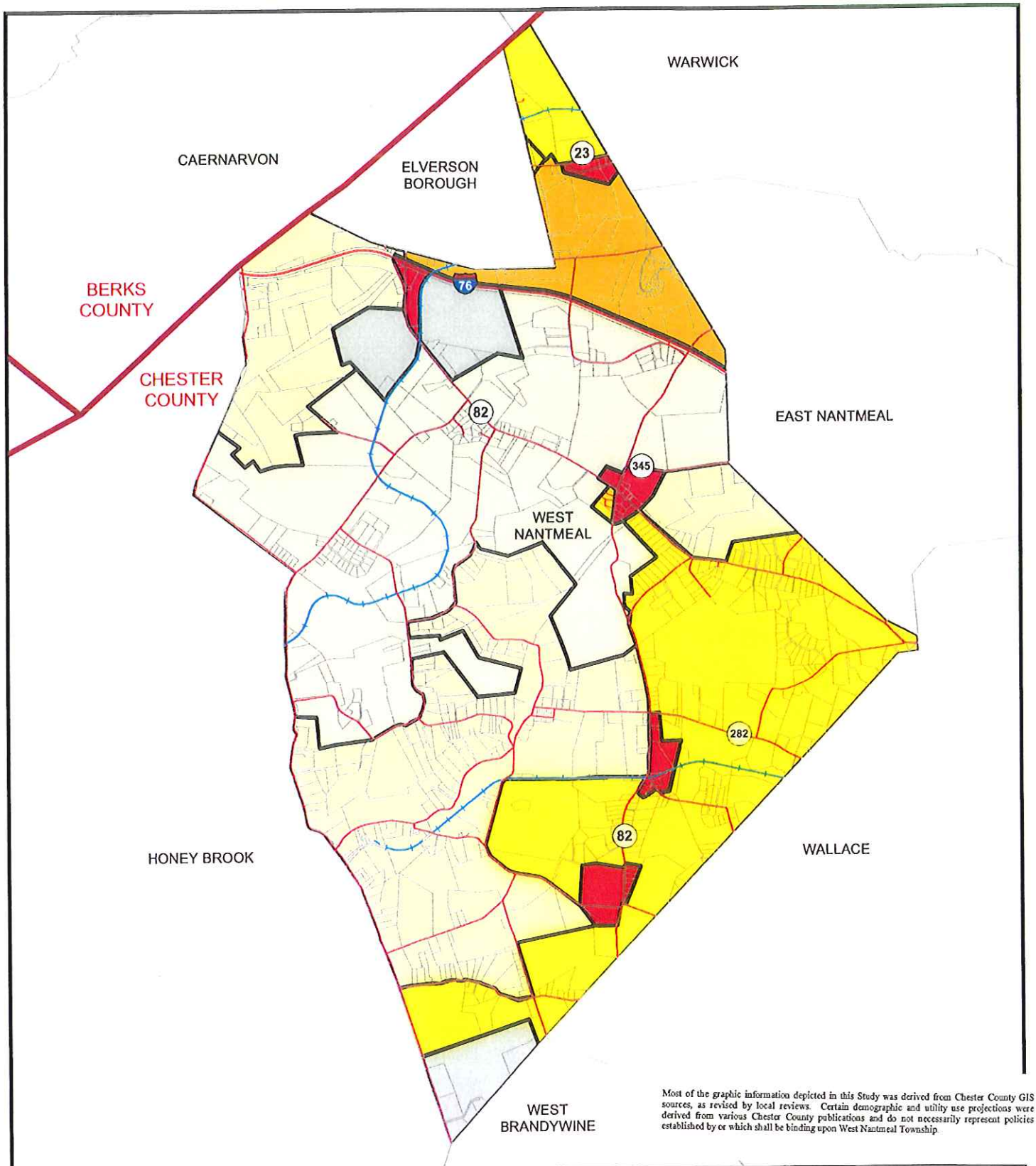
This revision provides for sewage facilities planning to permit the development of a golf course with 434 lots of mixed residential and light commercial use on two non-contiguous properties. The project area encompasses 530 acres in four municipalities. A portion of which (136.0 Acres) lies in West Nantmeal, just north of the PA Turnpike and south of Route 23 (Old Conestoga Road). Approximately 175 acres of the total 530 acres will be developed for residential use. Please see **Figure 15** for the location of the sewer service area.

According to the planning module, estimated flows from the West Nantmeal site are 83,212.5 gallons per day. This was calculated based on 262.5 GPD/EDU reflecting an average of 3.5 persons per EDU at 75 GPD/capita, including infiltration.

A new wastewater treatment facility will be constructed in Warwick Township to treat the estimated 125,000 gpd generated by the entire project. The facility will utilize treatment and storage lagoons with ultimate disposal by spray irrigation. Both the treatment facility and the low-pressure collection and conveyance system will be owned and operated by the Nantmeal-Warwick Sewer Company. Public water will be supplied by the Elverson Water Company.

4.2. Comprehensive Planning and Zoning

1. West Nantmeal Township Comprehensive Plan



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West Nantmeal Township
Chester County, PA

PA Act 537
Sewage Facilities Plan

Figure 15
Zoning

Legend

- County Boundary
- Township Boundary
- Parcel Boundary
- Major Road
- Railroad

Zoning

- R - 1 Agricultural-Residential
- L I Limited Industrial
- R - 2 Low-Density Residential
- R - 3 Residential
- R - 4 Suburban Residential
- V C Village Commercial

Source:
Degitized from Chester County Planning Commission, 1990

Scale: 1" = 4000'

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Gannett Fleming

September, 2004

The West Nantmeal Township Comprehensive Plan was adopted in December 1987. The West Nantmeal Planning Commission prepared this plan with assistance from the Chester County Planning Commission. This plan updated a previous comprehensive plan prepared in 1971.

The plan adopted a set of recommended goals and options for achievement in a number of different areas including natural resource conservation, land use controls, cultural heritage preservation, circulation, community facilities, and governmental controls.

The plan notes, "As pastoral and remote as West Nantmeal may seem, development pressures are building all around the Township, and it is anticipated that West Nantmeal itself will soon experience a significant increase in development activity."

Of particular importance to this Act 537 plan are the Township's goals related to preservation of its natural environment and rural character. As defined in the plan these goals are stated as follows:

GOAL: Preserve the Natural Environment

Recognize the public benefits of a clean, healthful environment and the responsibility of the Township to Brandywine Basin communities to protect ground and surface-water supply.

GOAL: Preserve Rural Character

Recognize the importance of woodlands, farms, and open spaces to the image of the Township and the importance of farming and farm-related businesses to the local economy.

2. West Nantmeal Township Zoning Ordinance of 1990, as amended.

The West Nantmeal Township Zoning Ordinance was adopted in 1990 and last amended in 2000. The zoning districts are illustrated in **Figure 15** of this plan.

The ordinance was enacted in accordance with the West Nantmeal Township Comprehensive Plan and includes a set of community development objectives relating to the management of land use, population density, and protection of natural resources and the continuation of agricultural activities.

The Zoning Districts in the Township include the: R-1 Agricultural – Residential, R-2 Low Density Residential, R-3 Residential, R-4 Suburban Residential, VC – Village Commercial, LI Limited Industrial.

In addition, the ordinance specifies several environmental overlay districts designed to conserve and protect the Township's most sensitive areas. These include a Flood Hazard Overlay District defined by specific soil types (Ch, We, WoA, WoB, and Woc), and areas within the 100-year floodplain as delineated by the Federal Emergency Management Agency (FEMA) for the National Flood Insurance Program. Other overlays include a Steep Slope Overlay District which includes areas with slopes over twenty-five (25) percent, and a Wetlands District.

3. Landscapes: Managing Land in Chester County (1996 -2020)

Landscapes is the land use policy plan for Chester County and was first adopted in 1996 and includes the County's vision for the year 2020. Landscapes and its associated Livable Landscapes map were updated in 2000. Landscapes recommends that development be encouraged in designated "Suburban" and "Urban" Landscapes, or "Suburban" or "Rural Centers" instead of in "Rural" and "Natural" Landscapes. According to the revised Livable Landscapes Map, the majority of West Nantmeal Township is designated as "Rural Landscape". Rural landscapes include farms, farm-

related businesses, and villages, along with some scattered housing sites. Limited development is to be directed to soils not well suited for agriculture. A small portion of the Township, adjacent to Elverson Borough and north of the PA Turnpike is designated as Urban Landscapes. According to the plan, Urban Landscapes are defined as the historic population centers of the County. They traditionally serve as the focal point of employment and the commercial and cultural centers for surrounding areas. Urban landscapes contain extensive existing infrastructure including sewer, water, and road networks. This area matches the area of the proposed Nantmeal-Warwick Sewer Service Area.

4. Watersheds: An Integrated Water Resource Management Plan for Chester County (Revised Draft, May 2002)

Watersheds was recently adopted as an element of Landscapes, Chester County's Comprehensive Plan. Watersheds was developed by the Chester County Water Resources Authority on behalf of the Chester County Board of Commissioners to support the implementation of Landscapes. In addition, Watersheds was developed to accomplish the following objectives:

- provide a water resources management plan to protect Chester County's natural resources and balance the needs of all users in support of existing land uses and planned growth,
- provide municipalities and other entities with an integrated framework of strategies and guidance to support sound land use and water resources management, and
- help citizens and stakeholders understand water resource issues and their role in protecting and preserving ground and surface water.

The planning horizon for Watersheds is 2020. The report presents results from the many components of the overall planning process. These include a summary of the 21 watersheds in the County, goals and objectives, priorities for watershed management,

planning for future water and wastewater needs, stakeholder roles, strategies for implementation and watershed indicators. With respect to West Nantmeal, a number of issues were raised regarding the Brandywine and French Creek Watersheds, which are the major watersheds in the Township. For example, the plan evaluated existing groundwater quality in the various watersheds and indicated that one of the primary ground water quality concerns is nitrate from septic systems and agricultural sources. According to Watersheds, high nitrate levels were identified in West Nantmeal Township streams. (Figure 1-2, Inventory of Problems and Potential Concerns). However, the actual sources of elevated nitrate concentrations (agricultural vs. septic) are difficult to pinpoint due to lack of data.

Watersheds indicates areas of future need and growth both for water and wastewater. With the exception of areas immediately adjacent to Elverson Borough, no areas within West Nantmeal are identified for future water or wastewater needs. Furthermore, it establishes the following guidelines, based on the policies of Landscapes:

1. Restrict the extension of sewer and water facilities in Rural and Natural Landscapes
2. Support the use of satellite systems and service areas to meet the needs of Rural Centers, Villages, cluster communities, and other isolated developed areas surrounded by Rural landscapes and where:

    i. ground water quality is unsafe and in home treatment is not practicable
    ii. the quantity of ground water resources or well yields area no longer sufficient to provide safe and reliable supplies to existing individual well users,
    iii. cluster communities are planned and individual septic systems are not a viable alternative,
    iv. septic discharges have significantly impaired ground water quality, and/or
    v. local conditions create widespread septic system failures or failed percolation tests.

5. Linking Landscapes: A Plan for the Protected Open Space Network in Chester County

Linking Landscapes is the open space element of the Chester County Comprehensive Plan and follows the policies set forth in Landscapes: Managing Land in Chester County 1996-2020. Linking Landscapes provides a vision for multi-municipal open space planning on a countywide basis. It provides some general guidance to municipalities for protecting open space. The countywide vision emphasizes both planning and protecting open spaces, and on restoring and maintaining them to ensure that their recreational and ecological qualities are retained.

One of the major recommendations of this plan is to limit development on all naturally sensitive areas such as steep slopes, hydric soils, wetlands, and floodplains through municipal ordinances and other mechanisms.

5.0 Existing Sewage Facilities in the Planning Area

5.1. Description of Sewage Facilities

Figure 16 shows the location of the sewage treatment and disposal facilities within the Township. Currently residences and businesses are either utilizing individual on-lot systems or community on-lot systems. There are no public sewers within West Nantmeal Township at the present time. Community on-lot disposal systems are used on a limited basis at one facility, the Loags Corner Mobile Home.

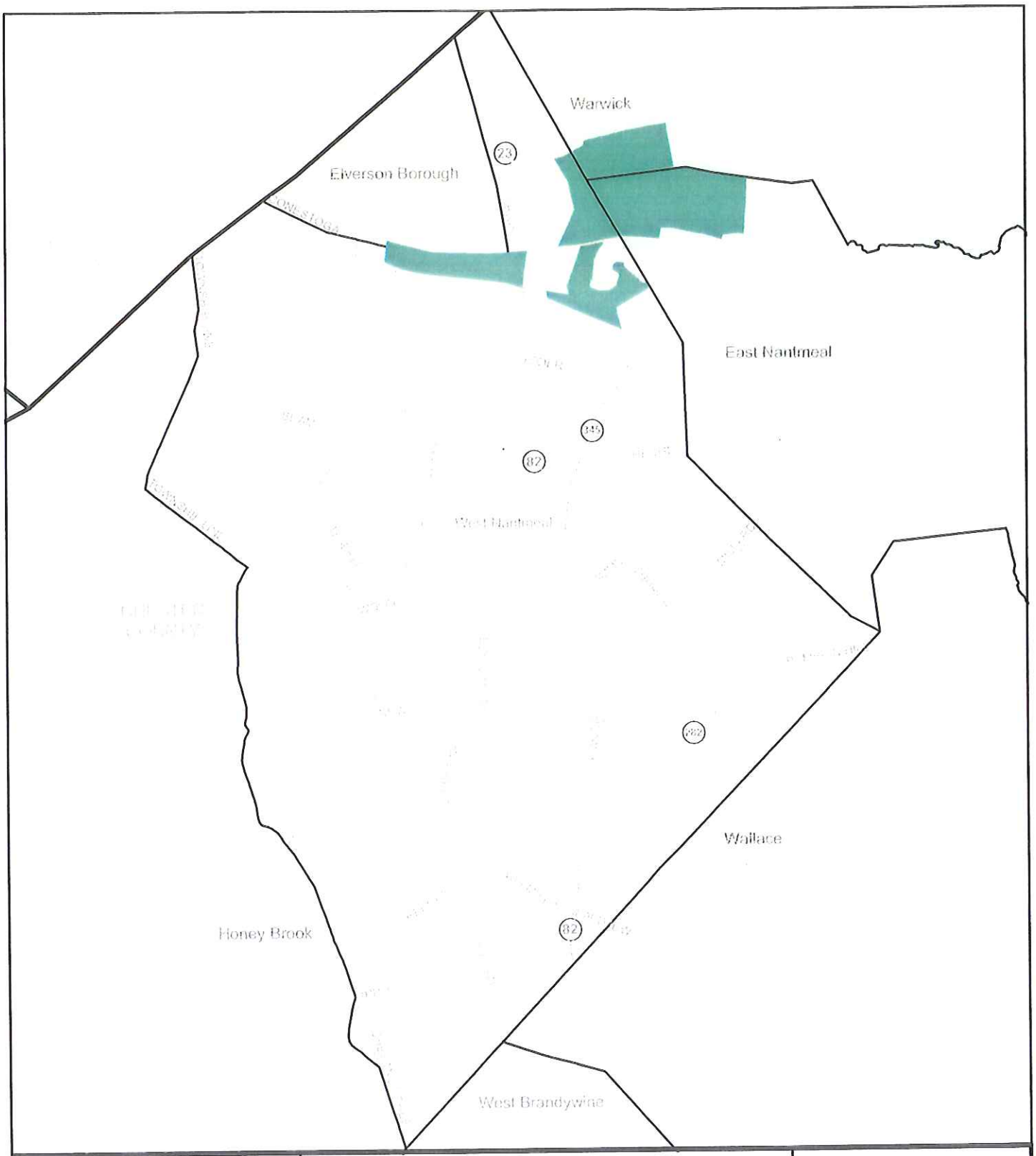
Records do not exist to provide detailed descriptions of the exact types of on-lot systems in the Township. The breakdown of system types is estimated through consultation with the Township staff and Township Engineer. Based on a general knowledge of the municipality, the relative age of the housing stock, and soil conditions, the breakdown of on-lot systems is noted in the Table below.

Table 7
Distribution of On-lot Sewage Facilities
West Nantmeal Township

Type of System	Percent of Total Systems	Number of units based on 2000 Census
Holding Tank	.07%	5
Conventional Septic System	65.58%	484
Elevated Sand Mound	31%	231
Cess Pools	3.35%	25

Source: US Census Bureau 2000, Fred Turner (Township Engineer)

The Chester County Health Department has no records of any malfunctions with the on-lot systems in the Township. Based on conversations with the Township Engineer, there are no documented problems with any system.



West Nantmeal Township
Chester County, PA

PA Act 537
Sewage Facilities Plan

Figure 16
Sewer Service Area

Legend

- Chester County Boundary
- Other County Boundary
- Township Boundary
- Major road
- Parcel
- French Creek Golf Club & French Creek Village 27+ units

Source:
Chester County Geographic Information Systems,
Hereford and Washington Townships

Scale: 1" = 4000'

Miles
0 0.25 0.5 1

Gannett Fleming

September, 2004

Most of the graphic information depicted in this Study was derived from Chester County GIS sources, as revised by local reviews. Certain demographic and utility use projections were

5.2. Location of Existing Facilities

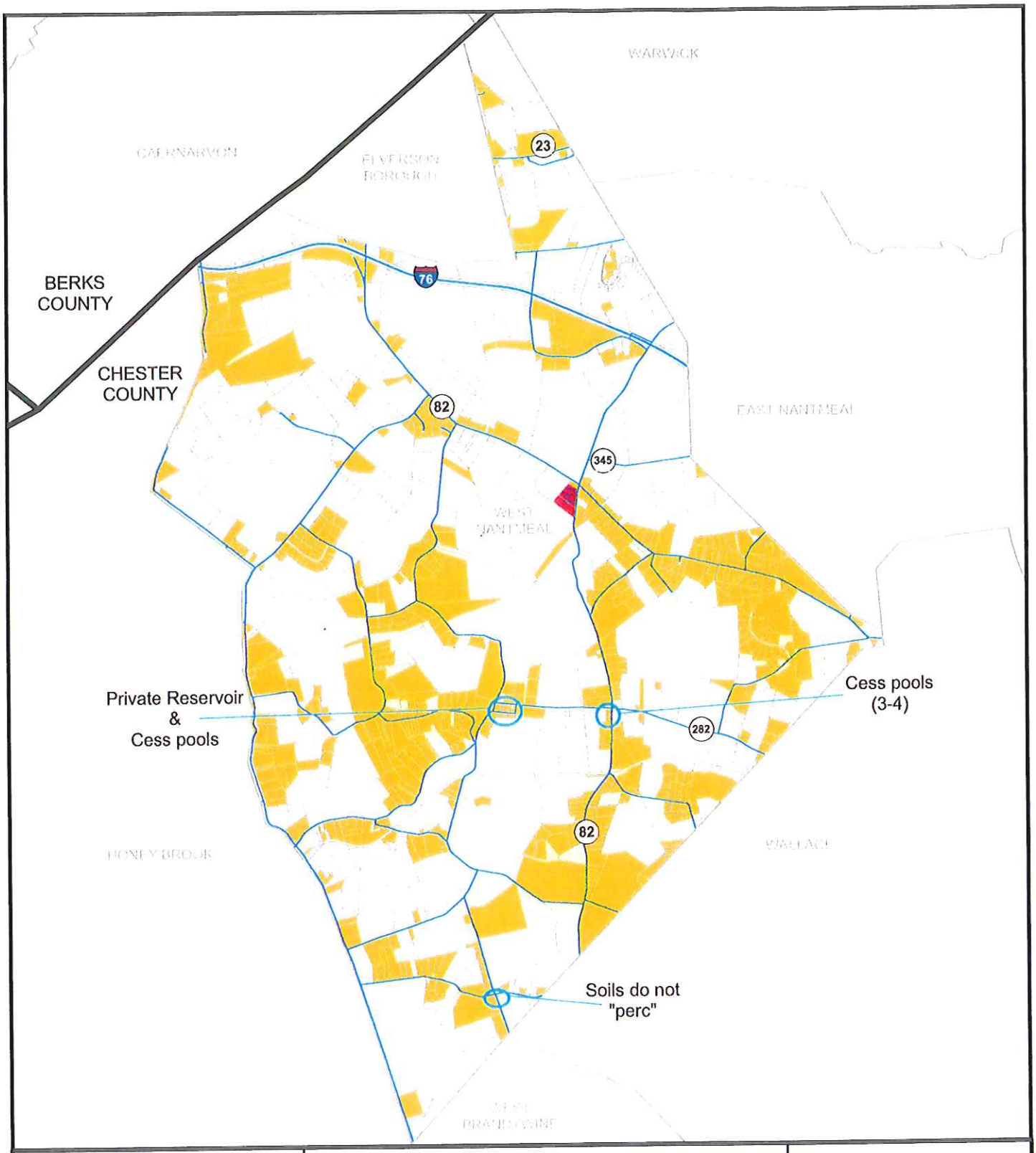
Figure 17 – On-lot systems shows areas with individual on-lot disposal systems, community on-lot disposal systems, cess pools and holding tanks throughout the Township.

In 1998, the Township enacted ordinance number 72-98, which governs the installation and maintenance of on-lot and community sewage systems requiring documentation verifying compliance and repealing ordinance 54-95. The purpose of the ordinance is to provide for the regulation, inspection, maintenance and rehabilitation of on-lot sewage disposal systems; to permit intervention in situations, which may constitute a public nuisance or hazard to the public health; and to establish penalties and appeal procedures necessary for the proper administration of a sewage management program. The ordinance states that the owner of a lot which uses a treatment tank system (septic tank) must have the tank(s) pumped and the contents disposed of at a licensed sewage disposal facility at least once every three (3) years by a Chester County Health Department licensed septic tank contractor.

The Township approved it's first community system in 2000. The proposed sewage system for the French Creek Golf Club and Village will serve 297 lots and 317 EDUs on West Nantmeal. A community spray irrigation system is proposed. In 2000, West Nantmeal, East Nantmeal, and Warwick Townships agreed to create a municipal authority among themselves called the Nantmeal-Warwick Sewer Authority to administer this system in three communities.

5.3. Monitoring On-lot Disposal Systems

Public health needs are considered to be those health hazards and water pollution problems that involve discharging untreated or inadequately treated sewage to the surface of the ground or to the waters of the Commonwealth (including groundwater). Most



West Nantmeal Township
Chester County, PA

PA Act 537
Sewage Facilities Plan

Figure 17
Types of Systems

Legend

- County Boundary
- Township Boundary
- Major Road
- Railroad
- Parcel
- Individual On-lot Disposal System
- Community On-lot Disposal System

Source:
Chester County Geographic Information Systems, Township Municipal Engineer

Scale: 1" = 4000'

0 0.25 0.5 1 Miles

Gannett Fleming September, 2004

Most of the graphic information depicted in this Study was derived from Chester County GIS sources, as revised by local reviews. Certain demographic and utility use projections were

commonly, these needs are found to be malfunctioning onlot disposal systems (OLDS) and malfunctioning community onlot disposal systems (COLDS). Onlot disposal system malfunctions are classified into three categories: confirmed, suspected and potential. Properly functioning onlot systems are added to these groups forming a fourth category. When determining the public health needs of an area using OLDS/COLDS, all systems inventoried, mapped and analyzed must be placed into one of these four categories:

a. **Confirmed Malfunctions**: Those malfunctions documented by dye testing, laboratory test results, observation by a certified Sewage Enforcement Officer or a professional with experience in OLDS, "Best Technical Guidance" repair permits, and seasonally wet absorption areas. Also included are piped discharges from a single structure with direct evidence of sewage (i.e. direct observation of soap suds, food residue, solids, odors, etc.), reported system backups, malfunctions with photographic documentation or other similar evidence.

b. **Suspected Malfunctions**: Those systems exhibiting some malfunction characteristics such as abnormally green grass in the vicinity of an absorption area, piped discharges from one (or more than one) dwelling without direct evidence of sewage (i.e. no observation of soap suds, food residue, solids, odors, etc.), absorption areas located in known unsuitable soils (observed wetlands, rock outcropping, etc.), cesspools (in high density development) and pit (not vault) privies.

c. **Potential Malfunctions**: Those systems that appear to be operating satisfactorily but were constructed prior to system permitting requirements (i.e. preregulatory systems), systems located in areas extremely unlikely to receive permitting by current standards, systems constructed in areas having soils mapped as unsuitable or with severe limitations for OLDS and systems located on

exceptionally steep slopes greater than 25 percent. Included as potential malfunctions are permits issued for OLDS repairs that meet Chapter 73 standards. While this needs category does not represent "stand alone" existing needs, the information may be utilized in a needs analysis to locate areas affected by poorly defined adverse circumstances. For example, clusters of legitimate repairs will often indicate areas requiring closer scrutiny.

d. **No Malfunction**: Those systems that appear to be operating satisfactorily, were constructed since the implementation of system permitting requirements, and appear to have been constructed in accordance with the permitting requirements in effect at the time of construction. For the purpose of needs identification, OLDS permitting under Act 537 became effective on May 15, 1972.

Based on the above criteria, West Nantmeal Township will evaluate the future wastewater treatment and disposal needs of the community.

6.0 Future Growth and Land Development

6.1. Planning Area Growth Potential

There are 5 developments currently planned for West Nantmeal Township. They include: Huntsfield, Devonshire Hills Subdivision, French Creek Golf Club and Village, Candleford, and the Ford Property. Onsite sewage and water facilities have been proposed for all of the above developments with the exception of the French Creek Golf Club and Village. The French Creek Golf Club and Village Development will be constructed in West Nantmeal Township, East Nantmeal Township, Warwick Township, and Elverson Borough. A revision to the official wastewater plans of the included Townships was approved by the PADEP on August 31, 2002. A community spray irrigation system is approved for this development. The various local and county wide comprehensive planning goals will be an integral part of the sewage facilities assessment of West Nantmeal Township.

6.2. Land Use Designations

The West Nantmeal Township Zoning Ordinance was adopted in 1990 and last amended in 1994. The zoning districts are illustrated in **Figure 15** of this plan.

The Zoning Districts in the Township include the: R-1 Agricultural – Residential, R-2 Low Density Residential, R-3 Residential, R-4 Suburban Residential, VC – Village Commercial, LI Limited Industrial.

6.3. Population Projections

The Chester County Planning Commission has developed the following population projections for West Nantmeal Township and the surrounding municipalities. Table 8 represents these population projections and trends for the years 2010, 2020, and 2030.

Table 8

Population Projections, 2010-2030

Municipality	Population	Projections		
	2000	2010	2020	2030
Pennsylvania	12,281,054			
Chester County	433,501	483,500	528,000	571,800
West Nantmeal Township*	2,031	2,190	2,280	2,390
CONTIGUOUS MUNICIPALITIES	24,285	27,671	31,100	30,910
Caernarvon Twp (Berks Co.)	2,312	2,711	3,130	
East Nantmeal Township	1,787	1,830	2,060	2,210
Elverson Borough*	959	1,310	1,630	2,010
Honeybrook Township*	6,278	7,150	7,750	8,440
Wallace Township	3,240	3,820	4,370	4,840
Warwick Township	2,556	2,650	2,650	2,680
West Brandywine Township	7,153	8,200	9,510	10,730
Twin Valley Region*	10,555	12,060	13,140	14,400

Source: US Bureau of the Census, 2000 and Chester County Planning Commission (2002), BonData (Caernarvon Twp.)

* Twin Valley Region includes Honeybrook Borough

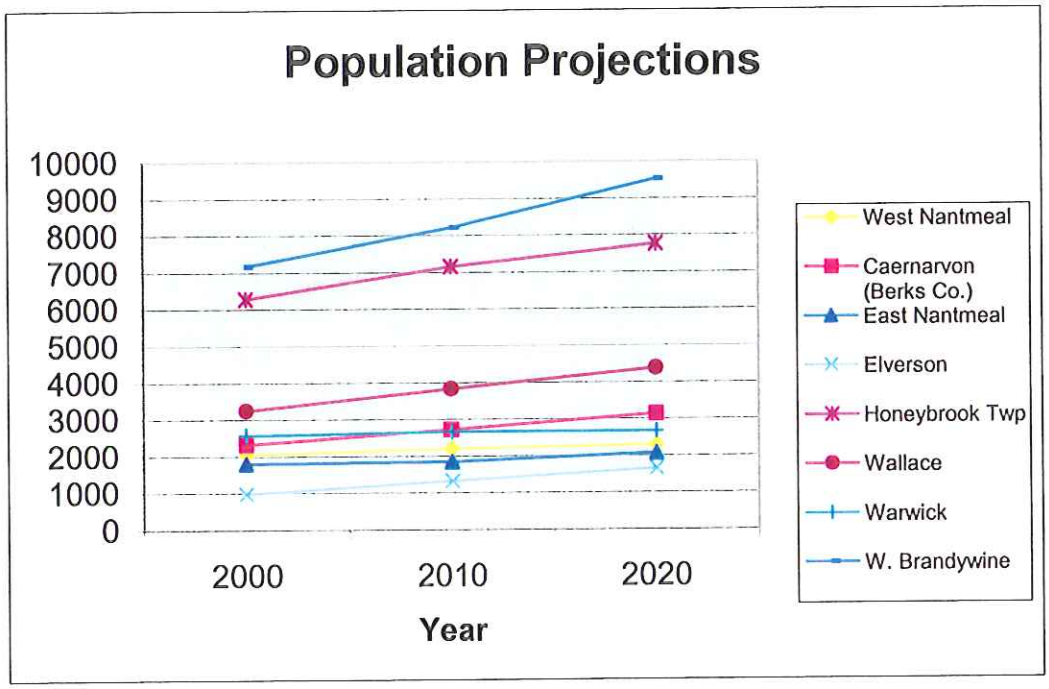


Figure 17

6.4. Land Use Planning and Zoning

As stated in Chapter IV, Section B of this Plan, the Township's goal is to preserve the Natural Environment and to preserve the rural character of the community. To achieve this the Township's Zoning Ordinance acknowledges the protection of the varied environmentally sensitive areas through an overlay concept. Chester County through the "Landscapes" planning reinforces this theme in West Nantmeal. The supporting documents to Landscapes, such as the "Watersheds" plan and the "Linking Landscapes" plan for open space, provide the foundation for the West Nantmeal Act 537 Plan.

6.5. Sewage Planning

West Nantmeal has determined that a hierarchy of alternatives for addressing sewage treatment and disposal best meets the local and County comprehensive and land use planning objectives. This hierarchy will require that any land development proposed in the Township will be required to utilize the most environmentally sensitive method of sewage treatment/disposal while keeping the rural character of the Township as an integral part of the analysis. An alternative analysis will be required for new land development in the Township as described in further detail later in this plan.

7.0 Identify Alternative

7.1. Wastewater Management Alternatives

The following will describe and evaluate wastewater management alternatives to provide for the needs of West Nantmeal Township. PADEP regulations require that the entire service area be evaluated based on the following set of guidelines which consider the range of regional, county and West Nantmeal as they relate to environmental, land use and water resource issues:

1. Avoid stream discharges to high quality or exceptional value streams. Chapter 95.1(b) of DEP's Regulations states that waters having a water use designated as High Quality Waters in Sections 93.6 and 93.9 shall be maintained and protected at their existing quality or enhanced, unless ... a proposed discharger of sewage, industrial waste, or other pollutants [can affirmatively demonstrate that] the proposed new, additional or increased discharge or discharges of pollutants is justified as a result of necessary economic or social development which is of significant public value. Exceptional Value waters, according to the DEP's Special Protection Waters Implementation Handbook, are maintained and protected at existing quality and uses because they have outstanding ecological and/or recreational values.

2. The Goal of the West Nantmeal Comprehensive Plan is to preserve the natural environment. To recognize the public benefits of a clean, healthful environment and the responsibility of the Township to Brandywine Basin communities to protect ground and surface-water supply.

3. Landscapes recommend that development be encouraged in designated "Suburban" and "Urban" Landscapes, or "Suburban" or "Rural Centers" instead of in "Rural" and "Natural" Landscapes.

4. Watersheds restricts the extension of sewer and water facilities in Rural and Natural Landscapes.

7.2. Alternative Evaluation for Land Development

The following is the hierarchy of alternatives with general descriptions that must be evaluated as part pf any proposed project in the Township. The selected alternative must be the lowest numbered PADEP approvable method on the list.

7.2.1. Septic Tank with Soil Absorption Field

Sewage is conveyed to the septic tank. Microorganisms in the tank break down the solids, which settle to the bottom. Liquids are piped through a distribution box into a soil absorption field where renovation takes place by the microorganisms in the soil. The septic tank needs to be pumped out in accordance with the PADEP guidelines.

7.2.2. Sand Mound

Sewage is conveyed to a septic tank where it received primary treatment (settling) from the septic tank wastewater flows into a storage tank. Liquid is pumped from storage tank to perforated plastic pipe in a sand mound that covers plowed ground. Liquid flows through rocks or gravel, sand and natural soil. Mound vegetation helps evapotransporate liquid.

7.2.3. Aerobic Tank with Soil Absorption Field

Sewage is conveyed to the septic tank. Microorganisms in the tank break down the solids, which settle to the bottom. Air is mixed into the sewage by a pump or propeller in an aerobic tank, where aerobic (oxygen using) bacteria digest the sewage. Digestion in

aerobic conditions is more effective that in non-aerobic conditions. The treated effluent is discharged to an absorption field, where any remaining nutrients are further removed by soil bacteria.

7.2.4. Individual Treatment with Spray/Stream discharge

This system uses mechanical or biological means to treat sewage, such as the aerobic tank. Various treatment technologies can also be used. After treatment and disinfection, the effluent is discharged to the surface via spray irrigation or to a receiving stream or swale for disposal.

7.2.5. Centralized Community System On-Lot

A community system serves more than 2 dwellings units and can take several forms. The Township will require that the following hierarchy of disposal alternatives be evaluated: a) drip irrigation, b) spray irrigation, and c) COLDS. A centralized community sewage treatment alternative may include a community on-lot disposal system (COLDS). Systems that rely on spray irrigation for the disposal of effluent must often rely on a storage lagoon system to retain the effluent when conditions do not permit spraying.

7.2.6. Community Sewer System

In the event that none of the lowered numbered alternatives is technically viable, the construction of a community sewer system may be considered at the developer's cost.

7.2.7. No Action Alternative

Under any situation, the no action alternative will be considered.

The following pages list the pros and cons of each of the alternatives.

Septic Tank with Soil Absorption Field

Advantages	Disadvantages
• Common on-lot system • Minimal demand on home owner • Pumped out once every 3 - 5 years or as per PADEP	• Individual home owner responsible for maintenance

Sand Mound

Advantages	Disadvantages
• Allows on-lot disposal with greater flexibility than subsurface systems	• Individual homeowner responsible for maintenance.

Aerobic Tank with Soil Absorption Field

Advantages	Disadvantages
• Common on-lot system • Minimal demand on home owner • Pumped out once every 3 - 5 years or as per PADEP	• Individual home owner responsible for maintenance

Individual Treatment with Spray/Stream discharge

Advantages	Disadvantages
• Addressed individual development without a centralized system	• Individual homeowner responsible for maintenance. • Possible groundwater contamination.

Centralized Community System (On-Lot)

Advantages	Disadvantages
• Economy of scale may be realized • Consistent Performance • Simple Operation	• Potential for ground water contamination • Odor problems • Large land area required • Ground water monitoring necessary • Dredging required to remove accumulated solids

Community Sewer System

Advantages	Disadvantages
• Individual property owners not responsible for sewage disposal • Public administration and financing	• High construction cost • Could encourage denser development

No Action Alternative

Advantages	Disadvantages
• Simple, no cost	• No development could occur or the Township would be mandated to do something that may be their first choice

8.0 Evaluation of Alternatives

8.1. Consistency with Planning Issues and State Regulations

TABLE I
DEP CONSISTENCY
Determination For Wastewater Management Alternatives

Evaluation Category	Consistency of Alternatives							Comments
	1	2	3	4	5	6	7	
Clean Streams Law or Section 208	Yes	Yes	Yes	Yes	Yes	Yes	No	The Alternatives are not in-consistent
Chapter 94- Municipal Wasteload Management Plans	Yes	Yes	Yes	Yes	Yes	Yes	No	Each Alternative will eliminate projected overloads, except 6
Title II – Clean Water Act	Yes	Yes	Yes	Yes	Yes	Yes	Yes	The Alternatives are not in-consistent
Township Comprehensive Plan	Yes	Yes	Yes	Yes	Yes	No	Yes	
Chester County Landscapes Plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	The Alternatives are not in-consistent
Antidegradation Requirements of PAChapters 93, 95, 102	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Water quality and erosion issues will be addressed during permitting
State Water Plan (Subbasin #2)	Yes	Yes	Yes	Yes	Yes	Yes	No	Water supply is not affected
PA Prime Agricultural Land Policy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	The Alternatives are not in-consistent
County Stormwater Management Plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Chapter 105 – Wetland Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	The Alternatives are not in-consistent
PNDI Review	Yes	Yes	Yes	Yes	Yes	Yes	Yes	The Alternatives are not in-consistent
Historical and Archaeological Resource Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	The Alternatives are not in-consistent

8.2. Evaluation of Alternatives

The Character of West Nantmeal Township is rural. The many farms already preserved through the County and State programs are a testament to this character. This Plan's conclusion, to best maintain this character would be for individual projects to "screen" each of the listed alternatives in this plan. The least impact to the environment and rural nature of the community will be considered by the Township. It is the developer's responsibility to evaluate the alternatives in accordance with PADEP requirements, Chester County Health Department requirements, County Planning documents, and local planning and code enforcement documents.

9.0 Recommended Technical and Institutional Alternatives

9.1. Recommended Alternatives

The recommendation of this Plan is to provide for individual projects to "screen" each of the listed alternatives in the project section. The least impact to the environment and rural nature of the community will be considered by the Township. It is the developer's responsibility to evaluate the alternatives in accordance with PADEP requirements, Chester County Health Department requirements, County Planning documents, and local planning and code enforcement documents.

9.2. Designate and describe financial plan chosen to implement the alternatives selected

The Township had funded this Act 537 analysis to establish the rules for evaluating wastewater disposal needs of the Community through existing funds and the PADEP grant program. The Township has also invested in establishing an on-lot management program and continues to implement it. Any additional cost to implement the selected alternative for a specific project will be at the developer's expense.

10.0 Institutional Evaluation

10.1. Analysis of existing organizations and authorities

West Nantmeal, as described earlier in the Plan, has formed an Authority in conjunction with East Nantmeal and Warwick Township's to administer the French Creek Golf Club and residential project. The Township has in effect an on-lot system management program ordinance to govern the balance of the community.

10.2. Activities necessary to implement the technical alternatives

The organization exists to implement the technical alternatives of this plan. The Township currently addresses the sewage needs of the community and can continue to do so after the adoption of this plan.

10.3. Describe administrative and legal activities to be completed and adopted to ensure the implementation of the recommended alternative

West Nantmeal Township has complied with all legal and administrative actions required for the adoption of this Act 537 Plan. A copy of all correspondence pertaining to the review and adoption of this Act 537 Plan has been included in Appendices A. Upon approval by the Pennsylvania Department of Environmental Protection, the Township shall implement the recommendations in this Plan.