2.1 DESCRIPTION OF THE PLANNING AREA

The base map data in the following sections has been provided by the Dauphin County Geographic Information Systems (GIS) department files with supplemental information provided by the United States Geological Society's (USGS) Enders, Grantville, Harrisburg East and Hershey topographic quadrangles. The data provided was organized to show the appropriate information as shown for each particular map.

2.1.1 Planning Area

The Planning Area for this Act 537 Plan Update is West Hanover Township, Dauphin County, Pennsylvania. West Hanover Township encompasses 22.6 square miles (14,464 acres) and is bordered by Middle Paxton Township to the north, Lower Paxton and Middle Paxton Townships to the west, East Hanover Township to the east, and South Hanover Township to the south. The Township is serviced by the traffic corridors of Interstate 81, U.S. Route 22 and PA Route 39. A general location map is presented on Map 1 and the planning area is detailed on Map 2 in Appendix J.

2.2 PHYSICAL CHARACTERISTICS

The Planning Area for this Act 537 Sewage Facilities Plan includes the entire Township of West Hanover, Dauphin County. This chapter will evaluate important physical characteristics that relate either directly or indirectly to sewage facilities within the Planning Area.

2.2.1 Streams and Watersheds

Within or bordering West Hanover Township, the three primary surface water streams are Fishing Creek, Beaver Creek and Walnut Run Creek (see Map 3 in Appendix J). All three creeks have headwaters originating within the Township and are tributary to the Susquehanna River. Beaver Creek forms the southwestern border of the Township. Additionally, named and unnamed tributaries within the Township drain into Fishing, Beaver and Walnut Run Creeks.

As shown on Map 2 in Appendix J, drainage boundaries separate the Township into five drainage areas/watersheds (shown with their usage designations as defined by Title 25, Chapter 93 of the Pennsylvania State Code):

1. The area that drains to Fishing Creek (WWF – Warm Water Fishery);
2. The area that drains to Beaver Creek (WWF – Warm Water Fishery);
3. The area that drains to Walnut Run Creek (CWF – Cold Water Fishery);
4. The area that drains to Manada Creek (CWF – Cold Water Fishery); and
5. The area that drains to Kellock Run Creek (WWF – Warm Water Fishery).

2.2.2 Floodplains

In accordance with the policies and procedures of the National Flood Insurance Program, the Federal Emergency Management Agency (FEMA) has prepared mapping of the 100-year floodplains for Fishing Creek, Beaver Creek and Walnut Run Creek in West Hanover Township (see Map 3 in Appendix J).

The majority of the properties in West Hanover Township are located outside of the 100-year floodplains of the Township's creeks; however there are properties in the Township within the 100-year floodplains of Fishing Creek, Beaver Creek, and Walnut Run Creek. The 100-year floodplain is an area based on past experience and high statistical probability that a destructive flood event will occur.

2.2.3 Ponds

Several small ponds are found in West Hanover Township. A majority of the ponds have been constructed as farm ponds or are abandoned farm ponds.

2.3 SOILS

The characteristics of soils in West Hanover Township were reviewed and analyzed to determine probable soil limitations for on-lot sewage disposal systems (OLDS) based on the 1972 *Soil Survey of Dauphin County, Pennsylvania*, prepared by the United States Department of Agriculture, Soils Conservation Service (USDA-SCS), and the GIS mapping provided by Dauphin County and the United States Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) (see Map 4 in Appendix J).

2.3.1 Soil Types

Soil types are mapped using abbreviations. The first two letters indicate the soil phase, i.e. the Ab for Albright in AbB. The third letter indicates the slope, i.e. the B in AbB. Slope categories are A, B, C, D, E or F:

A	0 to 3 percent slope
B	3 to 8 percent slope
C	8 to 15 percent slope
D	15 to 25 percent slope
E, F	greater than 25 percent slope, variations of slope

The following soils were encountered in the Township. They are further described in Table 2-2.

- Albright silt loams (AbA, AbB2, and AbgB)
- Andover loams (AnB, AoB, and AogB)
- Atkins silt loam (At)
- Basher silt loam (Bc)
- Bedington silt loams (BeA, BeB2, and BegB)
- Berks silt loams (BhB2, BhC2, BkB2, BkC2, and BkD2)
- Brinkerton and Armagh silt loams (BtA and BtB2)
- Buchanon loams (BuB, BvB, BxgB, and BxgD)
- Calvin silt loams (CaB, CaD, and CaF)
- Calvin-Klinesville silt loams (CkC2 and CkD2)
- Calvin-Leck Kill silt loams (ClA, ClB2, and ClC2)
- Captina silt loam (CmB2)
- Comly silt loam (CoB2)
- Dekalb sandy loam (DcC2)
- Dekalb and Lehew sandy loams (DlB, DlD, and DlF)
- Hazleton channery loam (HegF)
- Klinesville silt loams (KaB2, KaC2, KaD2, and KaE2)
- Laidig loams (LaB2, LaC2, LdB, LdD, and LdgD)
- Leck Kill channery silt loams (LegB, LegC, and LggB)
- Leck Kill-Calvin channery silt loam (LfgD)
- Meckesville gravelly loam (MfgB)
- Philo sit loam (Ph)
- Weikert shaly silt loams (WeC2, WeD2, and WeE2)

2.3.2 Prime Agricultural Soils

Prime farmland, as defined by the United States Department of Agriculture's Soil Conservation Service (USDA-SCS), is the land that is best suited for producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and water supply needed to economically produce a sustained high yield of crops when it is treated and managed using acceptable farming methods. According to the SCS, prime farmlands generally include class I and II soils, which produce the highest yields with minimal inputs of energy and economic resources. Qualities that characterize prime agricultural soils include high permeability to water and air, few or no rocks, optimum levels of acidity and alkalinity, 0 to 8 percent slopes, and the absence of flooding during the growing season. These soils may currently be utilized for crops, pasture, woodland, or land covers other than urban land or water areas.

Prime agricultural soils within West Hanover Township are depicted on Map 4 in Appendix J. The following soils are considered to be prime agricultural soils in the Township:

- Albright silt loams (AbA, AbB2, and AbgB)
- Basher silt loam (Bc)
- Bedington silt loams (BeA, BeB2, and BegB)
- Buchanon gravelly loam (BuB)
- Calvin-Leck Kill shaly silt loams (ClA and ClB2)
- Comly (CoB2)
- Laidig gravelly loam (LaB2)
- Leck Kill channery silt loam (LegB)
- Philo silt loam (Ph)

2.3.3 Hydric Soils

Hydric soils are poorly drained soils that develop an anaerobic (limited oxygen) surface layer because of long periods of saturation or inundation by water. These soils display slow permeability. A seasonal high water table is often commonplace in areas where hydric soils are dominant. Hydric soils are typically an indication of wetland areas. The following Township soils have major hydric components:

- Andover loams (AnB, AoB, and AogB)
- Atkins silt loam (At)
- Brinkerton and Armagh silt loams (BtA and BtB2)

The following Township soils have inclusions of hydric components:

- Albright silt loams (AbA, AbB2, and AbgB)
- Basher silt loam (Bc)
- Buchanon loams (BuB, BvB, BxgB, and BxgD)
- Comly silt loam (CoB2)
- Klinesville shaly silt loams (KaB2, KaC2, and KaD2)
- Philo silt loam (Ph)
- Weikert silt loams (WeC2, WeD2, and WeE2)

The areas in the Township with soils having major hydric components or inclusions of hydric components are shown on Map 4 in Appendix J.

2.3.4 Soil Suitability for On-Lot Sewage Disposal

Chapter 73 of Title 25 of the Pennsylvania Code presents design criteria and limitations for on-lot disposal systems. They are summarized in Table 2-1.

Table 2-1 On-Lot Sewage Disposal System Suitability Criteria

System	Hydric Soils	Depth To Bedrock	Depth to Seasonal High Water Table	Slope
Unsuitable for Any System	Yes	< 16 Inches	< 10 Inches	> 25%
Suitable for Elevated Sand Mound	No	20 Inches or Greater	20 Inches or Greater	<12%
Suitable for Conventional In-Ground	No	60 Inches or Greater	60 Inches or Greater	<25% for Standard Trenches <8% for Seepage Beds

Note: 1. In addition to limitations relating to soils, subsurface conditions, and slopes, absorption areas cannot be located within 100-year floodways.

The characteristics of the soils in West Hanover Township were reviewed and analyzed to determine the probable soil limitations for on-lot sewage disposal systems (OLDS) based upon the 1972 *Soil Survey of Dauphin County, Pennsylvania*, prepared by the United States Department of Agriculture, Soil Conservation Service. Table 2-2 and Map 5 in Appendix J present the general classification of soils within the Township based on the suitability for on-lot systems based on the Chapter 73 requirements and the information presented in the Soil Survey. In order to compare the Chapter 73 and Soil Survey information to determine the general classification, the following criteria were used:

A. *Soil Rating Criteria for Conventional Subsurface Systems*

The following ratings for subsurface systems apply only to deep soils with limiting zones greater than sixty inches (60"). In such areas, the following criteria were used to determine slight limitations, marginal limitations, and generally unsuitable conditions:

- Soils with limiting zones (groundwater or bedrock) at a depth less than sixty inches (60") are rated unsuitable for subsurface systems.
- Soils that exhibit slopes between eight percent (8%) and twenty-five percent (25%) are rated marginal for subsurface systems.
- Soils that exhibit slopes greater than twenty-five percent (25%) are rated unsuitable for subsurface systems.
- Soils with major hydric components are unsuitable for subsurface systems. Soils with inclusions of hydric components are rated at a grade lower than determined using the above.

B. *Soil Rating Criteria for Elevated Sand Mounds*

Soils with a depth of limiting zone between twenty inches (20") and sixty inches (60") typically require elevated sand mounds. In such areas, the following criteria were used to determine marginal or generally unsuitable conditions:

- Soils with limiting zones (groundwater or bedrock) at a depth less than twenty inches (20") are rated unsuitable for elevated sand mounds.

- Soils considered marginal for elevated sand mounds exhibit slopes greater than eight percent (8%) and less than fifteen percent (15%).
- Soils that exhibit slopes greater than fifteen percent (15%) are rated unsuitable for elevated sand mounds.
- Soils with major hydric components are unsuitable for elevated sand mounds. Soils with inclusions of hydric components are rated at a grade lower than determined using the above.

C. *Soil Rating Criteria for IRSIS*

In June of 1996 the Pennsylvania Department of Environmental Protection created another on-lot disposal alternative for areas that are unable to support subsurface systems or elevated sand mounds. This system, known as Individual Residential Spray Irrigation System (IRSIS), utilizes spray irrigation for ultimate disposal of treated domestic wastewater. In areas that are unsuitable for standard systems, the following criteria were used to determine marginal limitations and unsuitable conditions:

- Soils revealing a limiting zone of less than 10 inches (seasonal high water table) or 16 inches (coarse fragments/bedrock) are unsuitable.
- Soils that exhibit greater than 4% slope on agricultural land are unsuitable.
- Soils that exhibit greater than 12% slope on grass are unsuitable.
- Soils that exhibit greater than 25% slope on woodlands are unsuitable.
- Soils with major hydric components are unsuitable for IRSIS sytems. Soils with inclusions of hydric components are rated at a grade lower than determined using the above.

Based on the criteria outlined above, the majority of the soils in West Hanover Township are rated unsuitable for conventional subsurface systems primarily due to the shallow depth to limiting zones. Approximately two thirds of these soils are rated suitable and marginally suitable for elevated sand mounds. IRSIS systems could be used in some instances; however their operation and maintenance are complex and their applications limited. Therefore, they were not further investigated in this Plan. They should, however, be considered as an alternative when other methods are not suitable.

Soil Suitability for on-lot systems (not including IRSIS) for the Township is presented on Map 5 in Appendix J in three general categories:

1. Soils Suitable and Marginally Suitable for In-Ground Systems
2. Soils Suitable and Marginally Suitable for Sand Mounds but Unsuitable for In-Ground Systems
3. Soils Generally Unsuited for Conventional Systems

It should be understood that soil testing was not performed in conjunction with the preparation of this Act 537 Plan. Site-specific investigations are required to determine soil characteristics and OLDS suitability at a given location within the Township on a case-by-case basis.

Table 2-2 On-Lot Disposal Systems Soil Suitability Assessment

(* Indicates Prime Farmland)
(** Indicates Farmland of Statewide Importance)

Soil Symbol	Soil Name	Description	Slope (%)	Depth to Seasonal High Water Table (inches)	Depth to Bedrock (inches)	Hydric Soil (H) or Inclusions (I)	General Limitations					
							Conventional Inground Systems			Elevated Sand Mounds		
							Suitable	Marginal	Unsuitable	Suitable	Marginal	Unsuitable
AbA	Albrights*	silt loam	0-3	18-36	48-72	I			X		X	X
AbB2	Albrights*	silt loam, moderately eroded	3-10	18-36	48-72	I			X		X	X
AbgB	Albrights*	silt loam	3-8	18-36	48-72	I			X		X	X
AnB	Andover	gravelly loam	3-8	0-6	42-96	H			X			X
AoB	Andover	very stony loam	0-8	0-6	42-96	H			X			X
AogB	Andover	gravelly loam, extremely stony	0-8	0-6	42-96	H			X			X
At	Atkins**	silt loam		0	>60	H			X			X
Bc	Basher*	silt loam		18-36	48-60	I			X		X	X
BeA	Bedington*	shaly silt loam	0-3	>48	42-96			X		X		
BeB2	Bedington*	shaly silt loam, moderately eroded	3-8	>48	42-96			X		X		
BegB	Bedington*	channery silt loam	3-8	>48	42-96			X		X		
BhB2	Berks**	channery silt loam, moderately eroded	3-8	>48	24-42				X	X		
BhC2	Berks**	channery silt loam, moderately eroded	8-15	>48	24-42				X		X	
BkB2	Berks**	shaly silt loam, moderately eroded	3-8	>48	24-42				X	X		
BkC2	Berks**	shaly silt loam, moderately eroded	8-15	>48	24-42				X		X	
BkD2	Berks	shaly silt loam, moderately eroded	15-25	>48	24-42				X			X
BtA	Brinkerton and Armagh	silt loam	0-3	0-6	>42	H			X			X

Table 2-2 (cont.) On-Lot Disposal Systems Soil Suitability Assessment

(* Indicates Prime Farmland)

(** Indicates Farmland of Statewide Importance)

Soil Symbol	Soil Name	Description	Slope (%)	Depth to Seasonal High Water Table (inches)	Depth to Bedrock (inches)	Hydric Soil (H) or Inclusions (I)	General Limitations					
							Conventional Inground Systems			Elevated Sand Mounds		
							Suitable	Marginal	Unsuitable	Suitable	Marginal	Unsuitable
BtB2	Brinkerton and Armagh	silt loam, moderately eroded	3-8	0-6	>42	H			X			X
BuB	Buchanon*	gravelly loam	3-8	18-36	48-72	I			X		X	X
BvB	Buchanon	very stony loam	0-8	18-36	48-72	I			X		X	X
BxgB	Buchanon	gravelly loam, extremely stony	0-8	18-36	>60	I			X		X	X
BxgD	Buchanon	gravelly loam, extremely stony	8-25	18-36	>60	I			X		X	X
CaB	Calvin	very stony silt loam	0-8	>48	24-42				X	X		
CaD	Calvin	very stony silt loam	8-25	>48	24-42				X		X	
CaF	Calvin	very stony silt loam	25-75	>48	24-42				X			X
CkC2	Calvin-Klinesville**	shaly silt loam, moderately eroded	8-15	>48	24-42				X		X	
CkD2	Calvin-Klinesville	shaly silt loam, moderately eroded	15-25	>48	24-42				X			X
ClA	Calvin-Leck Kill*	shaly silt loam	0-3	>48	24-42				X	X		
ClB2	Calvin-Leck Kill*	shaly silt loam, moderately eroded	3-8	>48	24-42				X	X		
ClC2	Calvin-Leck Kill**	shaly silt loam, moderately eroded	8-15	>48	24-42				X		X	
CmB2	Captina**	silt loam, moderately eroded	3-8	18-24	>72				X		X	
CoB2	Comly*	silt loam, moderately eroded	2-8	18-30	42-60	I			X		X	X
DcC2	Dekalb**	loam, moderately eroded	8-15	>48	24-42				X		X	
DlB	Dekalb and Lehew	very stony sandy loam	0-8	>48	24-42				X	X		

Table 2-2 (cont.) On-Lot Disposal Systems Soil Suitability Assessment

(* Indicates Prime Farmland)

(** Indicates Farmland of Statewide Importance)

Soil Symbol	Soil Name	Description	Slope (%)	Depth to Seasonal High Water Table (inches)	Depth to Bedrock (inches)	Hydric Soil (H) or Inclusions (I)	General Limitations					
							Conventional Inground Systems			Elevated Sand Mounds		
							Suitable	Marginal	Unsuitable	Suitable	Marginal	Unsuitable
DID	Dekalb and Lehew	very stony sandy loam	8-25	>48	24-42				X		X	
DIF	Dekalb and Lehew	very stony sandy loam	25-80	>48	24-42				X			X
HegF	Hazleton	extremely stony very channery loam	25-60		>48				X			X
KaB2	Klinesville**	shaly silt loam, moderately eroded	3-8	>48	12-18	I			X			X
KaC2	Klinesville	shaly silt loam, moderately eroded	8-15	>48	12-18	I			X			X
KaD2	Klinesville	shaly silt loam, moderately eroded	15-25	>48	12-18	I			X			X
KaE2	Klinesville	shaly silt loam, moderately eroded	25-50	>48	12-18				X			X
LaB2	Laidig*	gravelly loam, extremely stony	3-8	>48	>72		X			X		
LaC2	Laidig**	gravelly loam, extremely stony	8-20	>48	>72			X			X	
LdB	Laidig	very stony loam	0-8	>48	>72		X			X		
LdD	Laidig	very stony loam	8-25	>48	>72			X			X	
LdgD	Laidig	gravelly loam, extremely stony	8-25	>48	>60			X			X	
LegB	Leck Kill*	channery silt loam	3-8	>36	42-72			X		X		
LegC	Leck Kill**	channery silt loam	8-15	>36	42-72			X			X	
LfgD	Leck Kill-Calvin	channery silt loam	15-25	>36	42-72			X				X
LggB	Leck Kill	channery silt loam, very stony	0-8	>36	42-72			X		X		
MfgB	Meckesville	gravelly loam, extremely stony	3-8						X			X
Ph	Philo*	silt loam		18-30	>60	I			X		X	X
Qu	Quarry								X			X

Table 2-2 (cont.) On-Lot Disposal Systems Soil Suitability Assessment

(* Indicates Prime Farmland)

(** Indicates Farmland of Statewide Importance)

Soil Symbol	Soil Name	Description	Slope (%)	Depth to Seasonal High Water Table (inches)	Depth to Bedrock (inches)	Hydric Soil (H) or Inclusions (I)	General Limitations					
							Conventional Inground Systems			Elevated Sand Mounds		
							Suitable	Marginal	Unsuitable	Suitable	Marginal	Unsuitable
Us	Urban land	shale materials							X			X
VsC	Very stony land	sloping							X			X
VsF	Very stony land	steep							X			X
WeC2	Weikert	shaly silt loam, moderately eroded	5-15	>48	12-18	I			X			X
WeD2	Weikert	shaly silt loam, moderately eroded	15-25	>48	12-18	I			X			X
WeE2	Weikert	shaly silt loam, moderately eroded	25-40	>48	12-18	I			X			X

2.4 GEOLOGIC FEATURES

The geology of an area dictates important groundwater characteristics, such as median well yields and the susceptibility of formations to transfer or accumulate contaminants, including bacteria from OLDS and nitrate-nitrogen from agricultural activities. According to *Groundwater Resources of the Lower Susquehanna River Basin, Pennsylvania* prepared by the Pennsylvania Geological Survey, the geologic formations underlying West Hanover Township produce groundwater with nitrate-nitrogen concentrations well below 5 mg/L.

The northern portion of West Hanover Township is underlain by a predominance of medium to coarse-grained sandstone and siltstone with some shale. The southern two thirds of the township are underlain by the Hamburg geologic formation, which is described as predominantly shale, siltstone and fine-grained sandstone, with some limestone bedrock. The following formations underlie the Township: Catskill Formation, Hamilton Group, Trimmers Rock Formation, Spechty Kopf Formation, Pocono Formation, Hamburg Formation, Martinsburg Formation, Bloomsburg Formation, Clinton Group and Tuscarora Formation. Dauphin County Spatial Data and data from the Pennsylvania Department of Conservation and Natural Resources were used to prepare Map 6 in Appendix J, which shows the geologic formations of the bedrock surface underlying the Township. The descriptions of the characteristics for the geologic formations are provided below. Additionally, limestone concentrations are shown on Map 7 in Appendix J.

Catskill Formation (Dck)
The Catskill Formation is a complex unit consisting of shales, siltstones and conglomerates which forms plateaus of medium relief with slopes that are stable at fairly steep angles. In West Hanover Township, four members of the Catskill Formation occur and include the Irish Valley Member (Dciv), the Sherman Creek Member (Dcsc), the Clarks Ferry Member (Dccf), and the Duncannon Member (Dcd). The fracture pattern is generally well developed, open and steeply dipping or vertical.

Hamilton Group (Dh)
The Hamilton Group consists of the Mahantango Formation and the Marcellus Formation. Both are gray, brown and olive siltstone with some fine to coarse-grained sandstone. They are not resistant to weathering and form rolling hills and valleys.

Trimmers Rock Formation (Dtr)
The Trimmers Rock Formation is a medium gray to olive gray siltstone and shale with some very fine-grained sandstone. It can be distinguished from the other Devonian sedimentary rocks by the dark-gray to black shale which occurs at its base.

Hamburg Formation (Oh)
The Hamburg Formation in West Hanover Township is represented by three lithotectonic units. These units consist of a graywacke unit, a limestone unit, and a phyllitic shale unit.

Hamburg graywacke (Ohg) occurs in small, isolated areas within the Hamburg Formation in West Hanover Township. This unit consists predominantly of greenish-brown siltstone, quartz pebble graywacke and shale. Red shale, sandstone and limestone beds occur within this unit.

Hamburg limestone (Ohl) occurs in small, isolated areas within the Hamburg Formation in West Hanover Township. This unit consists of interbedded limestone and micaceous shale and siltstone with minor beds of limestone conglomerate and red shale. Massively bedded calcarenite is often associated with the limestone.

Hamburg phyllitic shale (Oh): Most of the Hamburg Formation occurring in West Hanover Township is phyllitic shale. This unit consists predominantly of greenish-brown shale with well-developed fissility.

This rock is relatively resistant to weathering and forms rolling valleys of medium relief with slopes that are moderate and stable. This topography is characteristic of the southern two thirds of the Township.

Martinsburg Formation (Om)
The Martinsburg Formation occurs in a narrow band with an undefined contact with the Hamburg shale at the base of Blue Mountain. This formation is composed primarily of gray shale with interbeds of red and green shale. This shale is also highly fissile with a well developed seamy to platy fracture pattern.

Tuscarora Formation (St)
The Tuscarora Formation consists of sandstone and quartzite that are fine to coarse-grained and conglomeratic in part. The rock is characterized by its sparkling white appearance and extensive cross-bedding. It is highly resistant, firmly cemented and weathers to a shallow depth. It is further characterized by a well developed blocky fracture pattern which usually forms large boulder fields down slope from large outcroppings.

The Tuscarora Formation forms High Mountain Ridges with very high relief in rough terrain. In West Hanover Township, this formation is part of the resistant sandstones which underlie Blue Mountain.

Bloomsburg Formation (Sb)
The Bloomsburg Formation is part of the resistant rocks which form Blue Mountain. It consists of red shale and siltstone with local units of sandstones. These rock types are less resistant than the sandstones and quartzites of the Tuscarora Formation and Clinton Group, but form rolling hills of medium relief with slopes that are fairly steep and stable.

Clinton Group (Sc)
The Clinton Group is part of the resistant sandstones which form Blue Mountain. Its predominant members include the Rochester Formation, which is a brown to white quartzitic sandstone and the Rose Hill Formation, which is a reddish-purple shale with intertouguing sandstones. The Clinton Group weathers to a shallow depth with a thin overlying mantle. It forms ridges of moderate relief with stable and moderate to fairly steep slopes.

2.5 TOPOGRAPHY

West Hanover Township is located within the Blue Mountain and Great Valley sections of the Valley and Ridge Physiographic Province. The Township is bordered by the Blue Mountains to the north and the rolling hills and valleys of the Great Valley and Triassic lowlands to the south. Elevations in the Township range from 380 feet along Beaver Creek to about 1,180 feet at the top of the Blue Mountain just southwest of Manada Gap. (See Map 8 in Appendix J.)

Topography is an important factor in determining the suitability of an area for on-lot sewage disposal. See Section 2.3.4 for further discussion.

2.6 POTABLE WATER SUPPLIES

Public water supply is available to portions of West Hanover Township that are more densely developed as shown on Map 9 in Appendix J. The Pennsylvania American Water Company (PAWC) provides water supply service to much of the sewered areas of the Township. PAWC transmission waterlines run from a series of wells and pump houses in Westford Crossing in the southwestern portion of the Township to PAWC's distribution systems. The locations of the transmission lines are shown on Map 9 in Appendix J.

In all other areas of West Hanover Township, private wells are used to tap into the local aquifers as the source for potable water. Even in the areas where public water is available as a source for potable water, some residents continue to use private wells.

2.7 WETLANDS

Wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration to support a prevalence of vegetation typically adapted for life in saturated soils. Wetlands generally include swamps, marshes, bogs, and other areas that exhibit the three criteria for defining a wetland area: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology.

As more information has become available about the beneficial aspects of wetland habitats, scientists, engineers, environmental interest groups, and governmental agencies have worked to protect and maintain the unique environments. Along with the traditional uses of wetlands as fish and wildlife habitat, wetlands are now being used for stormwater management and wastewater treatment.

Wetlands are a critical component in many ecological processes and are consequently protected by the federal government. Wetlands provide the following benefits or functions:

- Fish and Wildlife Habitat
- Water Quality Maintenance
- Pollution Filter
- Oxygen Production
- Nutrient Recycling
- Chemical and Nutrient Absorption
- Aquatic Productivity
- Flood Control
- Recreational Land Preservation
- Educational Opportunities
- Microclimate Regulation
- World Climate Regulation
- Sediment Removal
- Energy Source (Peat)
- Open Space Preservation

The National Wetlands Inventory (NWI) mapping, as compiled by the U.S. Fish and Wildlife Service, is useful as a background source of information regarding wetland locations. The maps are prepared through the use of color infrared aerial photographs, and the quality of the maps varies dependant upon the time of year that the photos were taken and other factors. Field investigation, conducted by a trained scientist or engineer, is necessary to determine the actual presence or absence of wetland areas. Map 3 in Appendix J includes the available NWI information for the Township.

The following wetland types (NWI mapping codes) are found in West Hanover Township:

- PEM/SS1A – Palustrine, Emergent/Scrub-Shrub, Broad-Leaved Deciduous, Temporarily Flooded
- PEM1A – Palustrine, Emergent, Persistent, Temporarily Flooded
- PEM1C – Palustrine, Emergent, Persistent, Seasonally Flooded
- PEM1E – Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated
- PFO1/EM1C – Palustrine, Forested, Broad-Leaved Deciduous/Emergent, Persistent, Seasonally Flooded
- PFO1A – Palustrine, Forested, Broad-Leaved Deciduous, Temporarily Flooded
- PSS/EM1A – Palustrine, Scrub-Shrub/Emergent, Persistent, Temporarily Flooded
- PUBFx – Palustrine, Unconsolidated Bottom, Semipermanently Flooded, Excavated
- PUBHh – Palustrine, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded
- PUBHx - Palustrine, Unconsolidated Bottom, Permanently Flooded, Excavated