

## CHAPTER THREE

# Natural Features

This chapter provides an inventory and description of the township's natural features. Natural features range from below surface bedrock to the treetops of woodlands. For planning purposes, the most relevant are geology, soils, topography, surface water (e.g. streams, ponds, and wetlands) and floodplains, and woodlands. These features create the unique landscape that is Whitemarsh. They contribute to its attractiveness, add value to its built environment, and sustain its liveability. Their preservation not only ensures that the township will be a desirable place to live, but that it will also be a liveable place.

## Geology

Except for surface outcrops, bedrock geology is unseen, and as a result its influence on natural features is not always acknowledged. However, the influence is both strong and pervasive, for bedrock geology is the foundation of an area. Bedrock, along with the hydrologic cycle, is responsible for the changes in elevation, steep slopes, location of watercourses, and orientation (orientation, in turn, will influence vegetative communities, soils, and ultimately the availability of sunlight). The bedrock or parent material has a great influence on the formation of soil type. For example, hard, igneous bedrock has resulted in soils with a high stone and boulder content. Also, groundwater yield differs from one bedrock formation to the next. In Montgomery County, this difference ranges from under 1 gallon per minute (gpm) to several hundred gpm.

Montgomery County is located in the Triassic Lowland and Piedmont Upland section of the Piedmont Physiographic Province. The northern two thirds of the county contain the Triassic Lowlands which are primarily red shales and sandstones, with intrusions of diabase. Four formations, Stockton Sandstone/ Conglomerate/Shale, Lockatong Argillite/Shale, Brunswick Shale/Sandstone, and diabase, make up the Triassic Lowlands. South of this is the Piedmont Upland which is comprised of metamorphic and igneous rock (granite and schist), although there is a band of carbonate rock which stretches east from Chester County to Abington Township. Wissahickon schist/Granite gneiss/Hornblende gneiss, Chickies Quartzite, and Leger/Dolomite/ Elbrook/Conestoga Limestone, are the formation found in the Piedmont Upland. Whitemarsh is situated astride the dividing line of the Triassic Lowland and the Piedmont Upland. This results in one of the most geologically diverse areas of the county. North of the ridge line of Cold Point Hill, Militia Hill, Fort Hill, and Camp Hill, all of which are Chickies Quartzite formations, is the Triassic Stockton formation. Beginning with these ridge lines is a band of limestone and dolomite that is commonly known as the Chester-Whitemarsh Valley. The Valley extends countywide from King of Prussia, through Plymouth Meeting and Oreland, and terminates near Willow Grove. Throughout the township it is bordered on the north by the ridge line of the four Hills and extends south by the ridge line along Barren Hill Road and Germantown Pike-east of Church Road. Belted by Chickies Quartzite, it contains limestone and dolomite of the Ordovician and Cambrian periods. Also, along the Valley are two areas containing the Lower Cretaceous Patapsco formations (clay mixed with some sand). These areas are around Plymouth Meeting and Harmonville and extend from Butler Pike to Joshua Road.

In the southern portion of the Township, between the Chester-Whitemarsh Valley and the Schuylkill River are found the more resistant Wissahickon schist, Reading Prong granite gneiss, and Wissahickon mica schist. The more resistant character of these formations is exemplified by the rugged topography found in the area, and its association with the ridge lines.

The township geologic formations are delineated in Figure 3-1 and described in Table 3-1.

Except for the Stockton formation in the Broad Axe area and the Patapsco formation in Harmonville and Plymouth Meeting, the geologic formations in Whitemarsh are neither good nor reliable aquifers for development. For this reason, the 1965 Comprehensive Plan recommended that all major development be connected to public water. This statement is still true today.

The most significant geological formation in Whitemarsh is contained in the Chester-Whitemarsh Valley. As early as the 1680s, the Farmar family extracted limestone from the Valley for limekilns, creating the township's first industry. Since 1822, Corson Quarry (now Highway Materials), the nation's oldest continually operated quarry, has used its limestone. The Valley contains the very visible Militia Hill and Cold Point Hill ridge tops and the lowlands between them (along which runs Stenton Avenue). For land planning, this valley is significant because its limestone has a tendency to create sinkholes and linear depressions. The largest concentrations of these are found in the area bordered by Butler Pike, the Conrail line, Joshua Road, and Germantown Pike. A smaller area is located east near the intersection of Thomas and Flourtown Roads. This geological constraint is an extremely important land planning issue in these two areas.

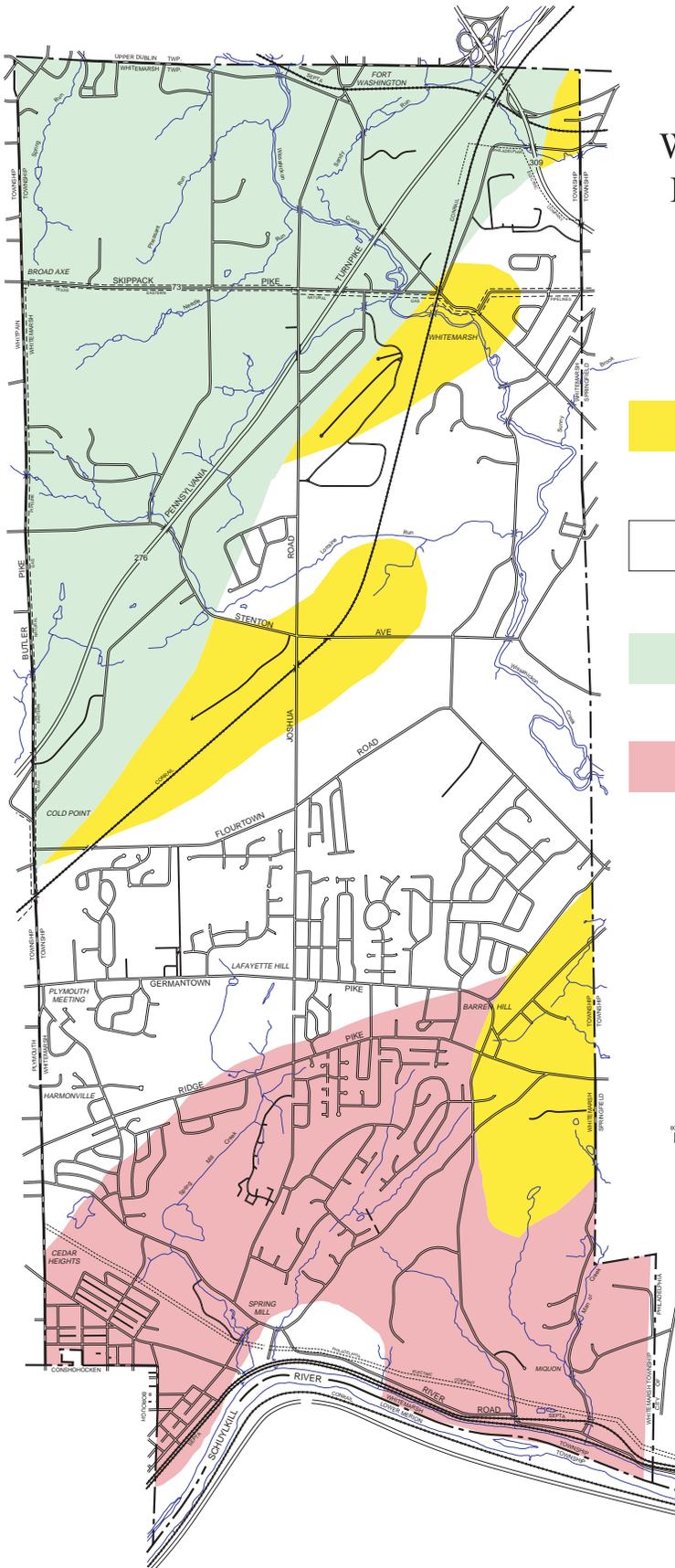
### SPECIFIC GEOLOGIC FORMATIONS

*A summary analysis of each geologic formation will be presented in the order in which they are found in the township, from north to south (see Figure 3-1).*

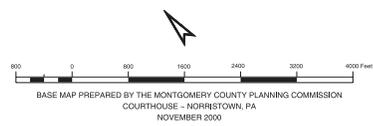
- **Stockton.** This formation consists of interbedded arkose, arkosic conglomerate, feldspathic sandstone, and red shale and siltstone. The formation grades in depth from 6,000 feet near the Montgomery County-Bucks County line to 2,300 feet at Phoenixville. The Stockton is the best aquifer in the township: the most production water yields are in the lower arkose member, and the middle arkose member. The upper shale member produces small yields. The highest yields have been reported for wells tapping the middle arkose member. Yields of modern drilled wells commonly exceed 50 gpm and may locally exceed 500 gpm.
- **Chickies.** This formation is composed of quartzite and quartz schist which has by virtue of its erosion resistant nature, formed a series of prominent ridges in Whitemarsh. These ridges, in effect, define the boundary of the Chester-Whitemarsh Valley in the Township. This formation is not extensive enough to be utilized for groundwater supplies. The most abundant water supplies are found in the fracture zones near the faults and near contacts with underlying gneiss.
- **Ledger.** This Cambrian dolomite is by far the most important economic geologic formation in the township. Corson Quarry is found in this formation. The quality of the limestone is such that it can be used in chemical work.  
  
The construction of heavy structures on this rock should be preceded by thorough investigation by a competent geologist since solution openings may be present. Solution openings, or subterranean caves, most frequently occur between depths of 50 to 300 feet, and may present piling and foundation problems.
- **Elbrook.** This Cambrian formation is found in a narrow band extending from Flourtown to Plymouth Meeting. The formation consists of blue dolomite and dolomitic limestone, some siliceous and shaly beds and weathers to a well drained yellowish-red loam. Solution openings which may be found in the substrata create certain structural problems for heavy buildings. Water yields are similar to that found in the Ledger formation.
- **Patapsco.** This formation is a seaward thickening wedge of nonmarine deposits representing several environments: stream, marsh, lagoonal, and estuarine. The deposits are highly lenticular, discontinuous beds of sand, clay, silt, and a little gravel. This formation is one of the more important sources of groundwater in southeast Pennsylvania. Well yields exceeding 1,000 gpm are common, but a number of wells have been reported to yield only 300 - 1,000 gpm. The lenticular character and variable permeability of sand aquifers do create problems in the location and design of wells.
- **Diabase.** A small dike of Triassic Feldspar and Augite outcrops near the intersection of Flourtown and Thomas Roads. This formation apparently has no economic value and has not contributed to the formation of any outstanding topographic feature.
- **Conestoga.** This Ordovician micaceous, shaly limestone extends in the relatively wide belt across the county and is bounded to the south by a ridge of the resistant Chickies quartzite. Groundwater occurs in unconfined to confine conditions in fractures and solution

# Whitemarsh Township Montgomery County Pennsylvania

Figure 3-1  
GEOLOGY



- Chickies, Quartzite and Quartz Schist
- Ledger Dolomite, Elbrook and Conestoga Limestone
- Stockton Sandstone, Conglomerate and Shale
- Wissahickon Schist, Granite Gneiss, Hornblende Gneiss



openings. The solution openings are most frequently found near streams and are less abundant in the shaly parts of the formation; where present they are usually found at depths of 50 to 300 feet. Water yields vary from 5 to nearly 1,500 gpm, although most produce less than 500 gpm. The water is moderately to very hard and contains a moderate amount of dissolved mineral matter; softening is required for some uses. The Barren Hill and Marble Hall residential areas as well as the Borough of Conshohocken are situated over this formation.

- **Wissahickon.** This formation consisting of crystalline rocks is in Whitemarsh, comprised of albite chlorite schist. The formation consists mostly of metamorphosed sedimentary rocks, but also includes rocks of igneous origin. In Whitemarsh, it forms the high ground extending from Cedar Heights to Barren Hill.
- **Reading Prong.** This formation of Pre-Cambrian granite gneiss underlies much of the southern portion of the township. The resistant character of the formation has undoubtedly contributed to the rough topography in the area. This formation does not yield large volumes of water because the rock is dense and without pore space to store water. The joints or cracks in the rock hold some water, but the yields are low and periods of prolonged drought may cause serious reductions in the supply.
- **Wissahickon.** This Lower Paleozoic formation differs from the previously mentioned Wissahickon formation in that the rock is oligoclase mica schist. This formation contains water in open fractures and also in intergranular pore spaces in the weathered zone. Porosity and permeability decrease with depth so that, with few exceptions, little water can be obtained below 300 feet. Generally, municipal drilled wells yield 20-100 gpm, while most domestic drilled wells yield 2-20 gpm; usually the water is soft.
- **Serpentine.** This formation is found in the extreme southern portion of the township, and forms barren, rocky outcrops on low hills and ridges. Only small quantities of water are contained in the fractures. The water is hard and mineralized (magnesium bicarbonate).

## Soils

Soils are a natural assortment of organic materials and mineral fragments that cover the earth and support plant life. The composition of soil changes slowly over time, due to weathering of rock and activity of soil organisms. As a consequence, soils vary with respect to depth to bedrock, depth to groundwater, color, mineral characteristics, fertility, texture, and erodibility.

Conversely, the type of soil influences the vegetative cover of the land, which affects the quality and quantity of surface and groundwater, wildlife diversity, rates of erosion, and the aesthetic quality of the landscape.

Though soils are diverse, soil scientists have classified the soils found in Montgomery County into several groups of soil series. Soils listed within the same series will display similar subsurface characteristics. Similar to and related to its diverse geological formations, Whitemarsh contains most of the soil groups listed in the county. However, for much of the land planning in the township, an exhaustive inventory of Whitemarsh's soils is not necessary. Detailed information pertaining to soil capabilities for agriculture and building purposes is available in the Montgomery County Soil Survey, which was completed for the county by the Soil Conservation Service of the U.S. Department of Agriculture and published in 1967. More important is an analysis of soils that contain development constraints such as wetlands or floodplains or those that have agricultural importance. This has been done for the entire township. It should be noted that soils in developed areas are known as made land. Made land is simply areas where earth moving during development has removed or altered the characteristics of the original soils. Much of the township's soil, in the area south of Flourtown Road, can now be classified as made land.

### *Prime and Important Agricultural Soils*

The agricultural capability of soil is measured based on fertility, depth to bedrock and groundwater, texture, erodibility, and slope. Soils are classified as prime farmland, farmland of statewide importance, and

other land, based on these characteristics. Prime farmland includes deep, well-drained, and moderately sloped soils that can support cultivation but require careful crop management. The remaining soils are best used for pasture and woodlands.

As Figure 3-2 shows, large sections of Whitemarsh contain important farmland soils. While much of these soils south of Flourtown Road have been disturbed by development, vast sections to the north remain as farmland, such as Erdenheim Farm, or have been preserved as parkland. The rest contain low density residential development or country estates.

### *Hydric Soils and Wetlands*

Hydric soils are periodically wet soils which, in an undrained condition, can support the growth of wetland vegetation, and generally indicate the presence of wetlands. Since not all hydric soils are found in undrained conditions, not all hydric soils exhibit wetland vegetation. For example, hydric soils that have been drained for agricultural use would not exhibit wetland qualities. However, undisturbed hydric soils are a conservative indication of wetlands and are found in areas such as depressions, bottom lands, swales, and frequently ponds. Hydric soils and the wetlands they support are worthy of protection for a number of reasons. Many wetlands provide critical habitats for birds, amphibians and semi-aquatic mammals, and some provide essential habitat (nursery grounds) for fish. Virtually all wetlands serve to increase biological diversity on a local level. Wetlands also mitigate flooding, holding back floodwater and slowing stream velocity. Wetlands improve water quality too; as water flows through a wetland, it slows and drops much of its sediment load. In addition, nutrients and other contaminants that can cause algae blooms and other pollution problems are taken up by wetland vegetation. Wetlands located in depressions often encourage infiltration of storm water, contributing to groundwater recharge.

Some wetlands are easily recognizable because the presence or influence of water is obvious. However, many wetlands are subject only to seasonal flooding and surface water may not be present for much of the year. Still other wetlands develop in areas where the soil is saturated for long periods, but never flooded. The Environmental Protection Agency (EPA) and the Army Corps of Engineers have defined wetlands as, “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.”

In Whitemarsh today, most wetlands are found adjacent to stream in riparian corridors, with smaller, isolated wetland pockets scattered throughout the township. Riparian corridors are especially important because they provide contiguous habitat for wildlife and flood protection for adjacent uplands. These wetlands are critical components of the green infrastructure that must be protected and nourished in order to retain a high quality of life. Unfortunately, much of the wetland habitat formerly found in Whitemarsh Township has been eliminated or otherwise degraded through the years. Therefore, it is very important to protect these remaining areas for the benefits that they provide to wildlife and in maintaining a sustainable community. For land planning purposes, the presence of hydric soils makes it very difficult to have on-site sewage facilities. Most hydric soils will fail percolation testing. Existing, undisturbed wetland areas are shown in Figure 3-3.

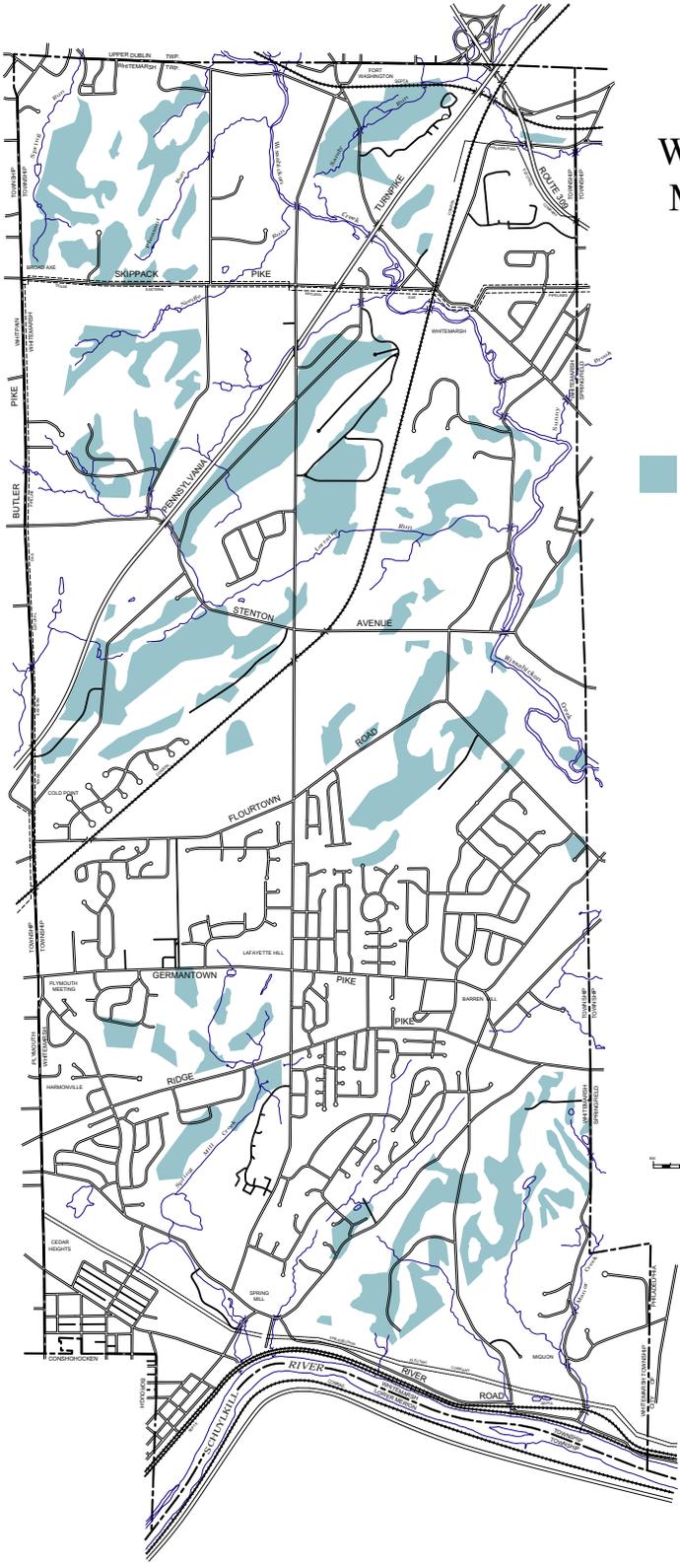
## Alluvial Soils

Related to hydric soils, alluvial soils are frequently, but not always, located within the floodplain. Changes in the tributary drainage area or slope of the adjacent stream may create a floodplain that is either larger or smaller than the area of alluvial soils. Also, alluvial soils can indicate the probability of a recurrence of a flood

Whitemarsh Township  
Montgomery County  
Pennsylvania

Figure 3-2  
IMPORTANT  
FARMLAND SOILS

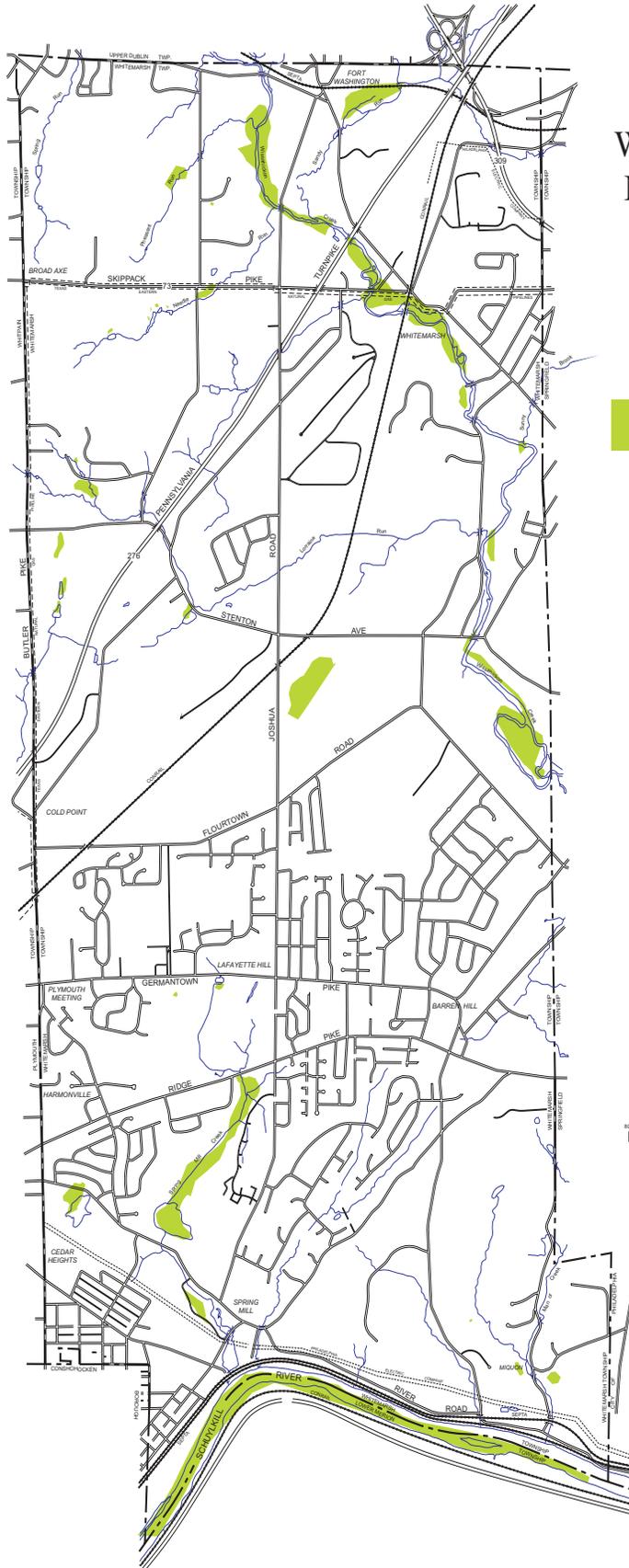
■ Important Farmland Soils



# Whitemarsh Township Montgomery County Pennsylvania

Figure 3-3  
WETLANDS

 Wetlands



BASE MAP PREPARED BY THE MONTGOMERY COUNTY PLANNING COMMISSION  
COURTHOUSE - NORRISTOWN, PA  
NOVEMBER 2000



(for example a 100-year flood). An aspect of alluvial soils is that they often form aquifer recharge areas, an important issue for a township where some portion of the water supply is served by wells.

Alluvial soils indicate a high water table. This means that the water table is from 0 to 3 feet below the surface. In such areas, it is not possible to have on-site sewage disposal. Often existing in conjunction with hydric soils, they primarily exist in stream corridors throughout the township. Their location is shown in Figure 3-4.

## Topography

The township is mostly comprised of slopes from 0 to 8 percent. This degree of slope generally presents a gently rolling effect, but also contains the flat areas found in the bottom of stream valleys and on the top of ridge lines. High concentrations of this slope are found in the Harmonville, Plymouth Meeting, Broad Axe, and Erdenheim Farm sections of Whitemarsh. Eight to 15 percent slopes are scattered throughout the township. The highest concentration of this degree of slope is found in the Miquon section of the township, spreading west to Joshua Road. Another significant area is along Militia Hill Road between Stenton Avenue and Skippack Pike.

Typically, slopes over 15 percent are considered steep slopes. In Whitemarsh, they are primarily located in the Miquon vicinity, with a particularly long length running along Barren Hill Road from River Road to Harts Lane. Another area of steep slopes is just south of Militia Hill Road, bisecting Joshua Road.

Generally, slopes of 0 to 8 percent are suitable for most types of development. Residential development is also possible, though less desirable, for 8 to 15 percent slopes. Large lot residential development or cluster development is the only type that should occur on 15 to 25 percent slopes. The flexibility found in these types of development allows for dwellings to be placed away from steep slope areas. Any slope above 25 percent should be restricted to parks, forests, or open space. In general, development on any steep slope should be avoided since it often leads to soil erosion which, in turn, results in sedimentation, habitat degradation, and poorer water quality in nearby streams.

Associated with slopes are elevation and relief. The highest point in the township is an area south of the Harts Lane and Barren Hill Road intersection. It is 400 feet above sea level. Conversely the lowest point is in Miquon, on the banks of the Schuylkill River, which is only 40 feet above sea level. The range between the highest and lowest points, called the relief, is 360 feet. The close proximity of these two areas results in the impressive ridge, which follows the river in this section of the township. Other high points are found in Cold Point, and along various sections of Militia Hill Road. The township's slopes are delineated in Figure 3-5.

## Surface Water and Floodplains

Surface water is a valuable resource which is consumed by people, utilized by business and industry as well as wildlife, enjoyed at recreational facilities, and used to assimilate treated wastewater (i.e. sewage). Our reliance on surface water spans virtually all aspects of our lives and our commitment to protecting the quantity and quality of available water should reflect this. The average rainfall in the county varies from 43 inches near City Line Avenue to 47 inches in the vicinity of Green Lane Reservoir. It should be noted that in any given year, annual precipitation can vary from the average by as much as 10 inches. Generally speaking, 25 percent of precipitation becomes direct runoff, 50 percent evaporates or is transpired by plants, and 25 percent replenishes groundwater.

## *Surface Water*

In Whitemarsh, the surface water that falls on or is carried through the township becomes part of the watershed. The township is separated into two virtually equal watersheds by a drainage divide that roughly parallels, from north to south, Stenton Avenue, Joshua Road, and Ridge Pike. The eastern section of the township drains into the Wissahickon watershed or drainage basin, while the western half drains into the Schuylkill drainage basin. These basins influence the direction of storm runoff, sewage flow, and development patterns. They are two of the most prominent natural features of the township and these corridors and floodplains influence all aspects of land planning in Whitemarsh.

- **Schuylkill Drainage Basin.** The Schuylkill Drainage Basin occupies the southwestern half of the township, and all of the creeks within the basin drain directly into the Schuylkill River. The minor drainage basins include those of the Plymouth, Spring Mill, Manor, and Andorra Creeks. Within these minor drainage basins, there are several subminor drainage basins. The rough topography in this section of the township was, in great measure, formed by the erosion process of the various streams.

The Plymouth Creek drains a significant area of the township along Butler Pike from Ridge Pike to Stenton Avenue and including the settlements of Plymouth Meeting and Cold Point. Spring Mill Creek drains much of the southern section of the township, including the Marble Hall area and parts of Plymouth Meeting and Lafayette Hill residential areas. The Andorra Creek drains the area on both sides of Barren Hill Road below Germantown Pike. Manor Creek drains the sparsely settled extreme southeastern sector of the township, and empties into the Schuylkill River at Miquon.

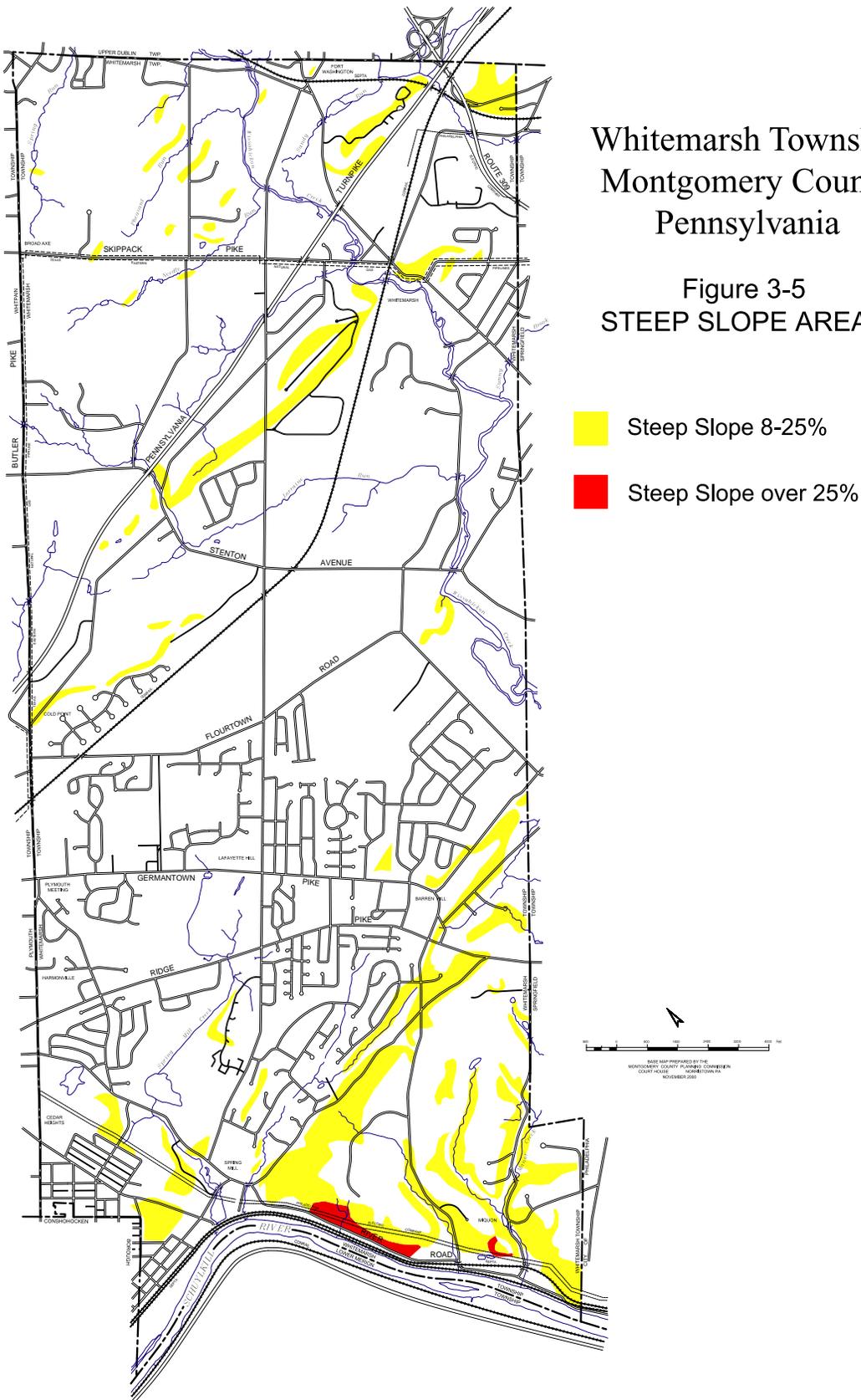
- **Wissahickon Drainage Basin.** The Wissahickon Drainage Basin is located in the northeast section of the township. The basin is traversed by the Wissahickon Creek and is also drained by several branches, and minor branches, of the creek: Prophecy Creek, Spring Run, Pheasant Run, Needle Run, three unnamed streams, Sandy Run, and Sunnybrook Creek. Within the minor drainage basins are numerous subminor drainage basins which complete the dendritic stream pattern of this drainage basin.

In the northern corner of the township there are four minor drainage basins, all of which are rather limited in area. These small basins are the Prophecy Creek, Spring Run, an unnamed stream, and the Pheasant Run. Two intermediate-sized minor drainage basins occupy the central-northeast portion of Whitemarsh and are the Needle Run and an unnamed basin. The only large minor drainage basin to the west of the Wissahickon Creek is the Lorraine Run which traverses the landscape from the Philadelphia Cricket Club, through a gap between Militia Hill and Cold Point Hill, and then northward into Whitpain Township. The two minor drainage basins to the east of the Wissahickon Creek are the Sandy Run, a fairly sizable area, and the Sunnybrook Creek, a basin consisting of two extremely small areas of Whitemarsh. A relatively significant portion of the township is drained directly by the Wissahickon Creek itself or by subminor drainage basins of comparatively little significance. With only a few exceptions the Wissahickon portion of the township is quite open with the only concentrations of development in the Prophecy Creek, Sandy Run, and Sunnybrook Creek drainage basins as well as within the area drained directly by the Wissahickon.

The Wissahickon, once it has passed through the township, flows through a portion of Philadelphia County. Philadelphia has preserved the stream valley from its mouth at the Schuylkill River to the Montgomery County line as part of the Fairmount Park system. The preservation of the stream valley was undertaken in the 19th Century in an effort to protect Philadelphia's drinking water, but this preservation has had the added benefit of creating an aesthetically pleasing park in a highly developed metropolitan area. In addition, and possibly more important, Fairmount Park provides a link, or unifying element, between the urban character of Philadelphia and the suburban and country atmospheres of the adjacent parts of Montgomery County. As more is understood about the importance of these links or

# Whitemarsh Township Montgomery County Pennsylvania

## Figure 3-5 STEEP SLOPE AREAS



greenways which provide connections between diminishing open spaces, it is noteworthy that the Wissahickon drainage basin already provides an extraordinary natural greenway running from Whitemarsh to the Schuylkill River, and from there right into the heart of Philadelphia. With the generosity and support of private landowners, leadership from the Wissahickon Watershed Association, and Natural Lands Trust, and the presence of the state and county parks that border the Wissahickon Creek, this greenway may one day eventually extend all the way through Whitemarsh Township.

The Federal Clean Water Act requires Pennsylvania to establish water quality standards for all streams and other water bodies in the state. The standards establish criteria that need to be met to protect designated water uses. That means that the streams are evaluated periodically to ensure that the water quality standards that are associated with the uses are met. The higher the standards, the higher the waterway's value for the protection and propagation of aquatic life.

Below is the federal government's list as it is used in Montgomery County, including a summary of what the water quality criteria is based on. The list is prioritized from the lowest designation (WWF) to the highest (EV).

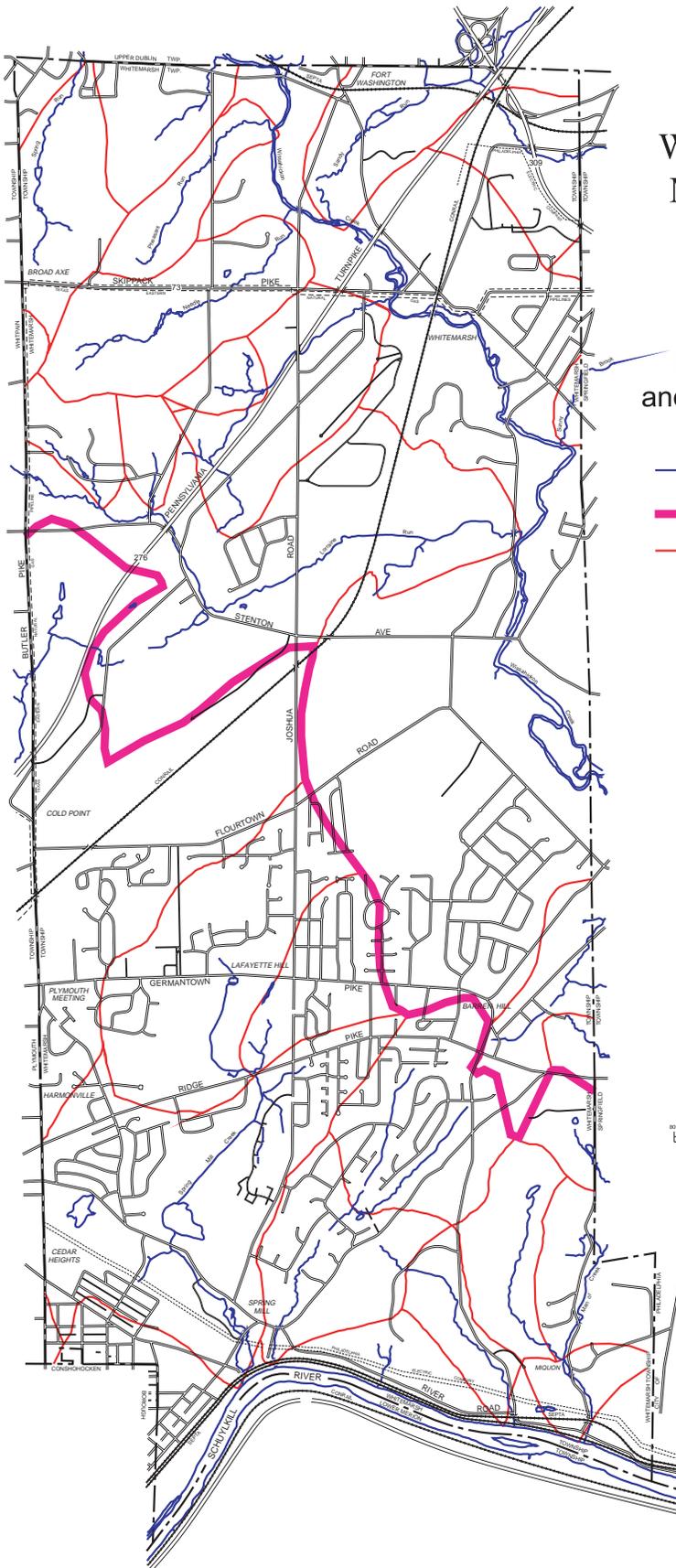
- WWF** *Warm Water Fishes* - Maintenance and propagation of fish species and additional flora and fauna that are indigenous to a warm water habitat.
- CWF** *Cold Water Fishes* - Maintenance and/or propagation of fish species including the family Salmonidae and additional flora and fauna that are indigenous to a cold water habitat.
- TSF** *Trout Stocking Fishes* - Maintenance of stocked trout from February 15 to July 31 and maintenance and propagation of fish species and additional flora and fauna that are indigenous to a warm water habitat.
- EV** *Exceptional Value Water-* A stream or watershed that constitutes an outstanding national, state, regional, or local resource, such as waters of national, state, or county parks or forests, or waters that are used as a source of unfiltered potable water supply, or waters of wildlife refuges or state game lands, or waters that have been characterized by the Fish Commission as "Wilderness Trout Streams," and other waters of substantial recreational or ecological significance.

The Wissahickon Creek has been designed TSF (Trout Stocking Fishes). This is the highest designation of any body of water running or standing in Whitemarsh. The Schuylkill River and its unnamed tributaries have been placed in the WWF (Warm Water Fishes) category.

Besides the above-mentioned streams and creeks, it's worth noting that Whitemarsh has one of the largest standing bodies of water in Montgomery County, Sherry Lake, created when an old quarry flooded. It is located along Cedar Grove Road, near Butler Pike. Currently surrounded by an apartment complex and not open to the public, it provides an attractive, if a somewhat startling amenity for the complex. Numerous smaller ponds dot the township, primarily in the area north of Flourtown Road. All are on private land and most were created by farmers. Figure 3-6 shows the location of all stream patterns and drainage basins in Whitemarsh.

# Whitemarsh Township Montgomery County Pennsylvania

Figure 3-6  
DRAINAGE BASINS  
and STREAM PATTERNS



- Stream Patterns
- Major Drainage Basins
- Minor Drainage Basins



## *Floodplains*

Floodplains provide storage for excess stormwater during periods of flooding and are an important part of a natural drainage system. When floodplains are encroached by development, flooding increases, and life and property are threatened. Because of this, the Federal Insurance Agency, which provides floodplain insurance for the nation, has strict regulations on development within the floodplain.

Because the aesthetic value of stream valleys is considerable, these areas are usually attractive and worth setting aside for passive recreation. If this is not done, the development of these stream valleys will destroy vegetation, disrupt wildlife by removing habitat and disturbing the water supply, and reduce the amount of groundwater recharge that normally takes place within floodplains.

With the development of floodplains, the absorption capacity of the watershed is decreased. Rooftops, parking lots, and street pavement all contribute to increased surface drainage and flooding. Stream valley preservation and detention basins should be used to control storm water and decrease floodplain drainage.

Floodplains and stream corridors serve important functions beyond the conveyance of storm water. Trees and vegetation along stream corridors absorb precipitation and control snow and ice flow into the stream. If stream corridors are encroached by development, the vegetation that would control the flow of precipitation into the stream is absent and stream flows become irregular. Irregular flow means that the stream highs and lows will also be altered. If impervious coverage is increased, this cycle is exacerbated as the rate of runoff is increased and snow and ice melt faster. In effect, the developed surfaces and the increased runoff that they cause result in a greater propensity for streams to flood due to their inability to absorb the additional water.

In Whitmarsh, the largest floodplain is associated with the Wissahickon Creek. Fortunately most of the creek and its floodplains are protected by their location within Fort Washington State Park. The Schuylkill River has a floodplain which runs along the entire western border of the township, but its overall impact is limited because the steep bank curtails development along much of its corridor. It is most pervasive in the Spring Mill area. Other notable floodplain areas are located along Needle Run and the Spring Mill and Andorra Creeks. The township floodplains and flood prone areas are shown on Figures 3-7 a and b.

## Woodlands

Montgomery County was originally covered by a dense forest of hardwoods. Oaks were the dominant species, but Chestnut, Tulip tree, Hickory, Ash, Red Maple, and Dogwoods were also present. After several hundred years of clearing, cultivation, and later, the rapid development of houses and commercial facilities, Montgomery County woodlands are only a shadow of their former extent. The principal types of woodlands remaining in the county are:

- **Red Oak** - About 60 percent of all remaining woodlands. Northern Red Oak is predominant, but Black, Scarlet, and Chestnut Oak are also abundant.
- **Ash/Maple/Elm** - About 19 percent of all woodlands. Local mixtures will vary, and include minor species, such as the Slippery Elm, Yellow Birch, Black Gum, Sycamore, and Poplar.
- **Eastern Red Cedar** - About 18 percent of the county' wooded acres are covered with this species and associated species: Gray Birch, Red Maple, Sweet Birch, and Aspen.
- **Sugar Maple/Beech/Yellow Birch** - The remaining 3 percent of woodlands is comprised of this association. Associated species include Red Maple, Hemlock, Northern Red Oak, White Ash, and Tulip tree.

The presence of woodlands, especially larger tracts, is important in Whitemarsh for both functional and aesthetic reasons. Woodlands prevent soil from eroding in steep slopes, shallow soils, and other areas. They provide habitats for wildlife which, in turn, offer recreational and educational opportunities for area residents. Woodlands provide natural buffer areas around surface and on top of subsurface watercourses which prevent siltation and help to minimize non-point pollution. In addition, woodlands help to clean the air, protect privacy, create windbreaks, cool the air in the summer, muffle noise, and absorb odors. Woodlands, including hedgerows and larger woodland connections, are also extremely important from the standpoint of providing cover for wildlife movement and migration. Finally, woodlands and hedgerows provide a scenic quality that helps to create the character of the community and enhance property values.

The township's woodlands are primarily located north of Flourtown Road, with the dominant area being in Fort Washington State Park. Other significant woodland in this area is scattered throughout the Broad Axe area, particularly west of Sheaff Lane and around the Sunnybrook Country Club. South of Flourtown Road prominent woodlands still exist along Manor Road in Miquon, along Barren Hill Road from Spring Mill to Harts Lane and at the Silt Basin site, north of Cedar Grove Road. The location of significant woodlands is shown in Figure 3-8.

## Pennsylvania Natural Diversity Inventory

The township does contain two sites that were noted by the Pennsylvania Natural Diversity Inventory (PNDI). This inventory was established in 1982 as a joint venture between the Nature Conservancy, the Pennsylvania Department of Environmental Resources, and the Western Pennsylvania Conservancy. This inventory has since become the state's chief storehouse of information on outstanding natural habitat types, sensitive plant and animal species, and other noteworthy natural features. Of the two sites, one is located within the Fort Washington State Park. This site contains 10 to 12 endangered tree species and is classified of having statewide significance, the inventory's highest classification. It contains species that are in danger of extinction within the state. However, by virtue of its location within the park, the site is, in essence, protected. The other site is similarly classified and is located long the banks of the Schuylkill near Miquon. This site contains over 1,000 plants of an endangered sedge. This site is not protected. As is the policy of the PNDI, the specific species of trees or plants is not identified. Their approximate location is shown in Figure 3-9.

## Township-Wide Map of Potential Conservation Lands

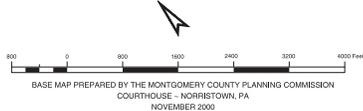
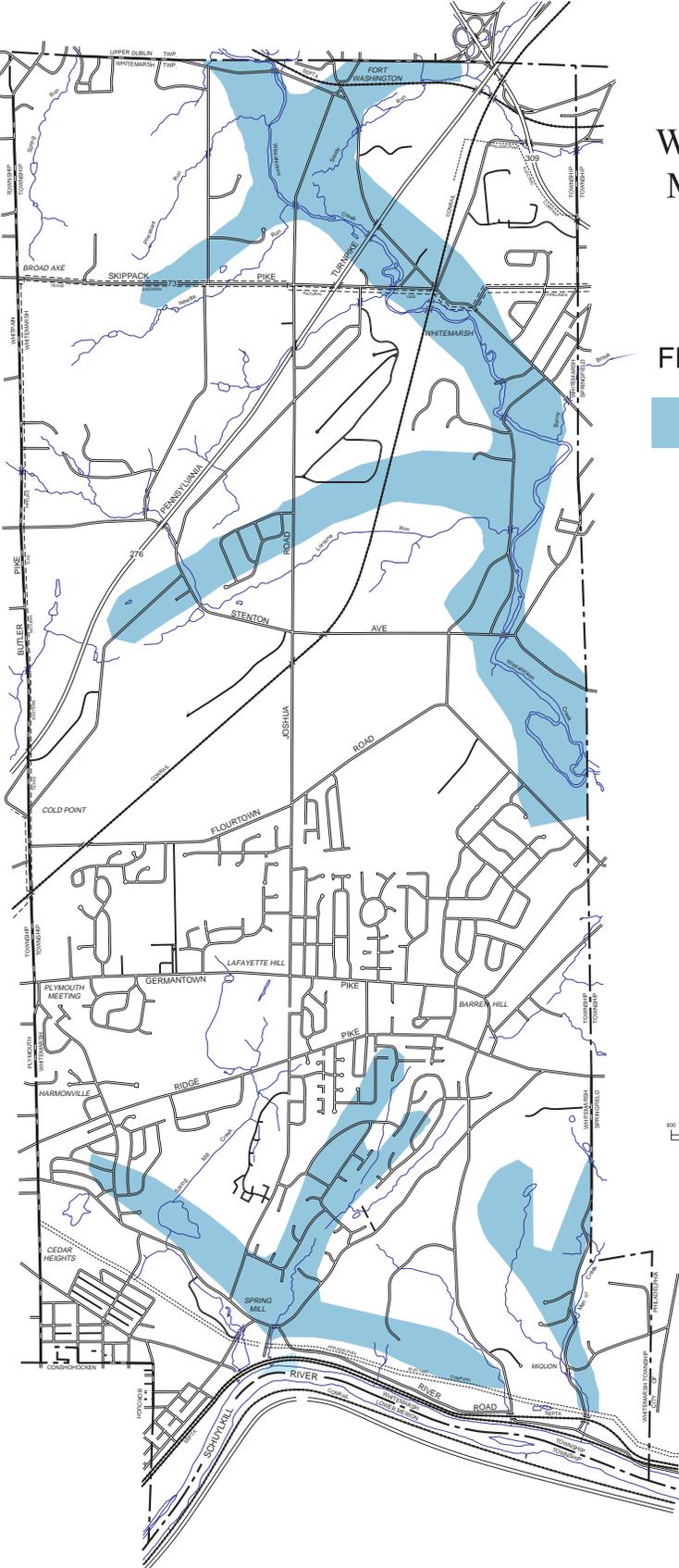
The Township-Wide Map of Potential Conservation Lands is a composite map containing numerous natural features and delineating how they relate to each other. It is divided into two categories, the primary features, which is comprised of all natural features on which development is constrained by ordinance, and the secondary features, which contains natural features not protected by ordinance, or other amenities, such as historic artifacts, that the township wants to preserve. For Whitemarsh Township the latter consists of historic and cultural artifacts, important farm soils, woodlands, steep slopes (8-25%) and scenic roads and vistas; the former consists of such typical constraints to development as floodplains, steep slopes over 25 percent, and wetlands. By placing these two sets of features on a township-wide parcel line map it becomes apparent which portions of a tract or parcel are desirable for development and which are not—the areas containing primary and secondary features.

The idea for this map came from Randall Arendt, a landscape architect, and was first promulgated in his book, *Rural by Design*. Arendt, building upon the idea of the traditional cluster subdivision, where houses are clustered together to save open space on a tract, and the ideas of Ian McHarg, the noted University of Pennsylvania professor, who advocated the retention of all the natural features on a site to promote sustainable development, developed a concept known as the conservation subdivision. It is a form of subdivision

# Whitemarsh Township Montgomery County Pennsylvania

## Figure 3-7a FLOOD PLAIN AREAS

 Flood Plains



BASE MAP PREPARED BY THE MONTGOMERY COUNTY PLANNING COMMISSION  
COURTHOUSE - NORRISTOWN, PA  
NOVEMBER 2000



Figure 3-8



# Whitemarsh Township Montgomery County Pennsylvania

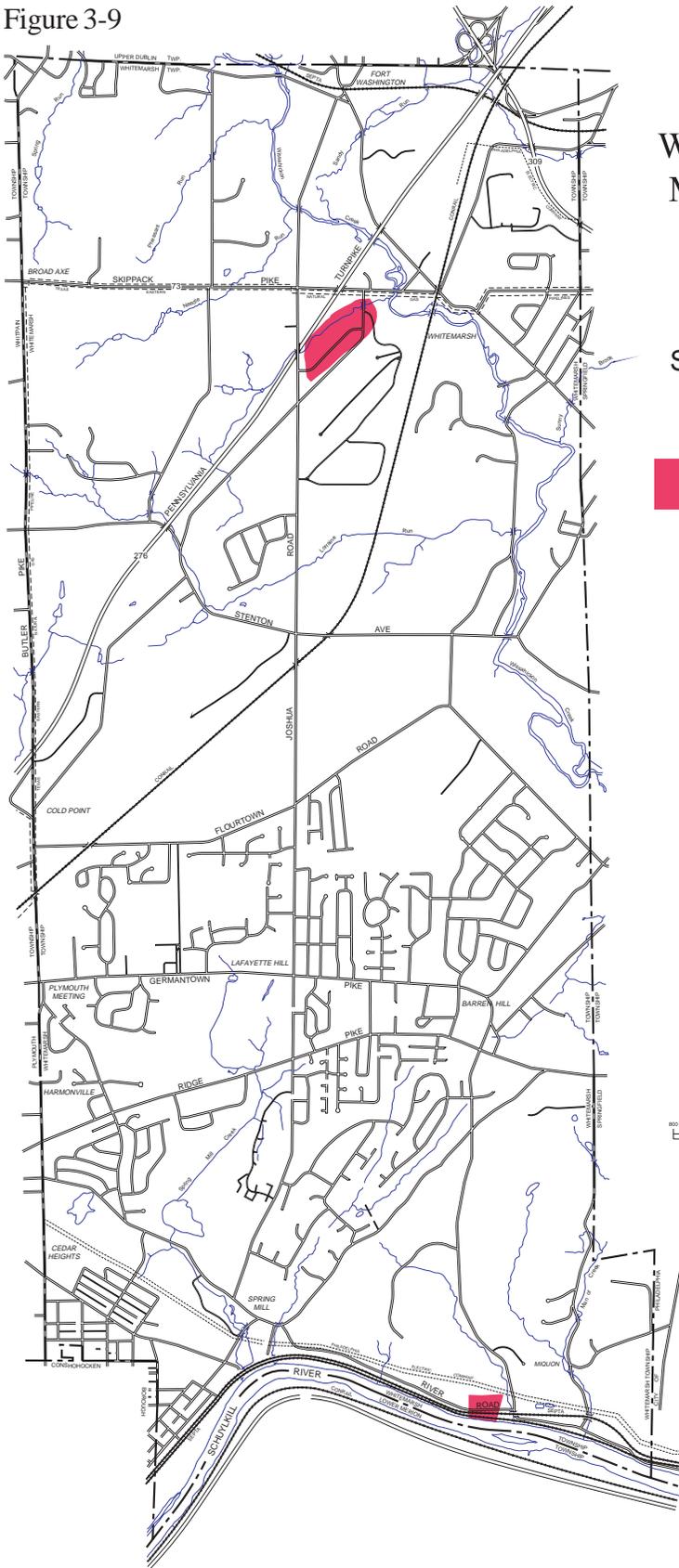
## Figure 3-8 WOODLAND AREAS

 Woodland Areas



DATE MAP PREPARED BY THE  
MONTGOMERY COUNTY PLANNING COMMISSION  
COURT HOUSE     HIGHTSTOWN PA  
NOVEMBER 2000

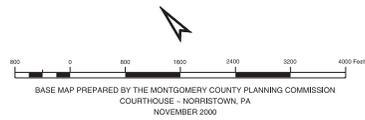
Figure 3-9



# Whitemarsh Township Montgomery County Pennsylvania

Figure 3-9  
SPECIAL CONCERN  
SPECIES AREAS

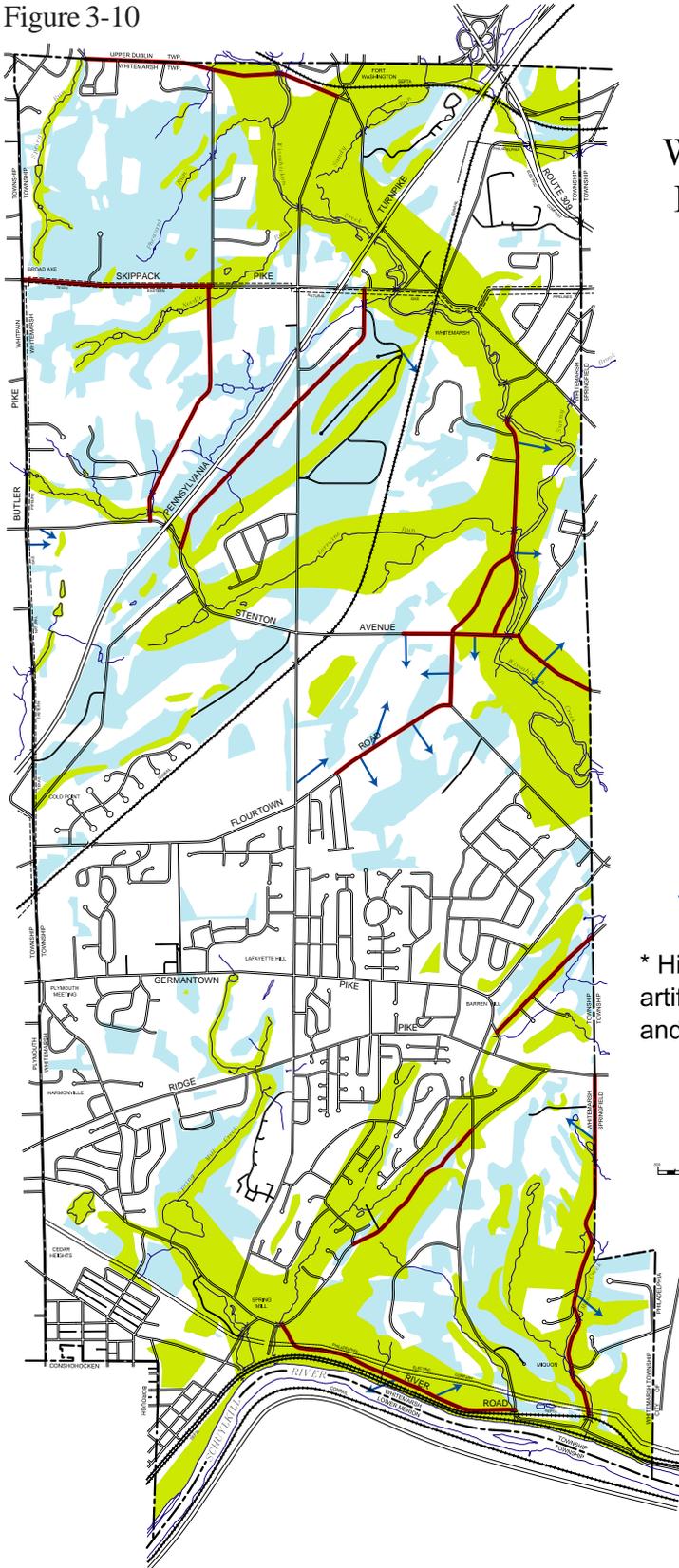
 Special Concern  
Species Areas



that allows development at the underlying zoning density of the tract, but requires the preservation of the primary natural features and also tries to preserve many of the secondary features, the amenities that have been chosen by a community as important to them and thus worthy of preservation. To preserve the underlying density, a developer is offered numerous options, from a traditional cluster subdivision to a village hamlet. These options are chosen based upon what type of housing market the developer is hoping to create or capture. It is also assumed that, depending upon the extent and quality of the site's secondary features, some of these secondary features may be lost during the development process. As this process proceeds, the township and developer will work together to determine which and how many of these secondary features should be retained and preserved.

Arendt's ideas are collectively known as Growing Greener and have been pioneered in this region by Wallace Township in Chester County and Upper Salford Township in Montgomery County. During the planning process for this document they were presented to and embraced by Whitemarsh and are being proposed for adoption for the township's medium and low density zoning districts, the A through AAAA Districts, areas that contain the largest amount of undeveloped land. The Township-Wide Map of Potential Conservation Lands is shown in Figure 3-10.

Figure 3-10



# Whitemarsh Township Montgomery County Pennsylvania

## Figure 3-10 CONSERVATION FEATURES

### Primary Features

- Flood Plain
- Flood Prone
- Steep Slope
- Wetlands

### Secondary Features\*

- Important Farm Soils
- Steep Slope 8-25%
- Woodlands

Scenic Roads

Scenic Vistas

\* Historic structures and cultural artifacts are regulated by ordinance and are not listed on this map

