NATURAL FEATURES AND AGRICULTURAL CONSERVATION PLAN

Overview of the Natural Features of the Region

Steep Slopes

The Suburban Berks West planning region contains areas of both steep and very steep slopes: land between 15 and 25% grade (steep slopes) and land over 25% grade (very steep slopes). It is important to know where steep slopes are located because all steep slopes are susceptible to erosion when soil and vegetation are disturbed. Steep slopes can add significantly to the cost of constructing and maintaining roads and buildings. Steep slopes also limit the placement of on-site sewage systems.

Most of Spring Township is flat to gently rolling agricultural areas. Steep and very steep slopes are concentrated in the south and south-central areas of the Township. There are a few steep slopes along the Tulpehocken Creek in the north, as well as just south of Paper Mill Road. Sinking Spring Borough has a steep and very steep slope concentration in the northwestern area of the borough north of U.S. 422. The Borough of Wyomissing has many very steep slopes along the area just north of U.S. 422 and a few steep slopes occurring sporadically throughout the borough, especially along the Tulpehocken Creek and Schuylkill River corridors. West Reading has some very steep slopes along the Schuylkill River.

Rivers and Streams

Rivers and streams are valuable aquatic habitats that provide both active and passive recreation as well as drinking water sources. The major river in the Suburban Berks West area is the Schuylkill River, which flows south and is on the eastern border of West Reading Borough and separates the City of Reading from the region. Another major waterway is the Tulpehocken Creek, which forms the border of northern Spring Township and northern Wyomissing Borough before joining the Schuylkill River.

Tulpehocken Creek in Wyomissing

Pennsylvania's Water Quality Standards designate protection categories for streams and establish water quality criteria for each category that are used in regulating the discharge of effluent into streams. Cold Water Fisheries are streams that should be protected as habitat for cold water fish and other fauna and flora indigenous to cold water. Warm Water Fisheries are streams that should be protected as habitat for warm water fish and other fauna and flora indigenous to warm water. Trout Stock Fisheries are streams that qualify for trout stocking by the State.

Within the region, the Schuylkill River is considered a Cold Water Fishery. Portions of the Tulpehocken Creek qualify as Cold Water Fisheries as well as Trout Stock Fisheries. The Cacoosing Creek is one of a few tributaries to the Tulpehocken Creek, and qualifies as a Warm Water Fishery and Trout Stock Fishery at various sections. Wyomissing Creek is considered a Cold Water Fishery. Little Muddy Creek, part of the Susquehanna River Basin, qualifies as a Warm Water Fishery and a Trout Stock Fishery.

On the Natural Resources map, Figure 1, the Wyomissing Creek is shown as a High Quality stream. This additional designation means the creek needs additional water quality protection. Part of the required protection is addressed in what is called the Municipal Separate Storm Sewer permit (MS4). This permit program through the Department of Environmental Protection requires that individual municipalities must implement a stormwater program through six Minimum Control Measures such as education and outreach which must protect the quality of its local water bodies from being degraded via the MS4. Specifically, the Wyomissing Creek being designated as High Quality requires additional requirements such as a Pollution Reduction plan meaning a diet of the amount of sediment and nutrients the creek takes on in a given year and which must be reduced by 10% in the five year permit cycle.

Watersheds

A watershed is defined as, the land that water flows across or under, on its way to a stream, river or lake. Within each watershed, all water runs to the lowest point be that a stream, river or lake. On its way, water travels over several types of surfaces such as farm fields, forests, suburban lawns and city streets, or it seeps into the soil and travels as groundwater through aquifers. Various factors lead to the destruction of our community's waterways, including runoff from agriculture, stormwater, removal of vegetation, and misuse of pesticides and fertilizer

The watersheds within the Suburban Berks West planning area are shown on the Natural Resources map Figure 1. Spring Township alone has four different watershed boundaries within its borders. They include the Schuylkill River watershed, Tulpehocken Creek watershed and the Conestoga River Watershed and the Cocalico creek watershed. The boroughs in the planning region are either within the Tulpehocken Creek or Schuylkill river watersheds.

Watersheds are a valued natural resource which should be protected for such reasons as clean water for drinking sources, recreation purposes and habitat for various flora and fauna species.

Flood-Prone Areas

As shown on the Natural Resources map, Figure 1, the 1% floodplain areas are those areas that, on average, have a one in one hundred chance of flooding in a given year, according to the Federal Emergency Management Agency (FEMA). Besides providing natural habitat, floodplains carry flood waters and help moderate flood heights. Interfering with these natural functions can result in more severe flooding, costly property damage and possibly the loss of life. The 0.2% floodplain is an area that is expected to be covered by water once every 500 years according to FEMA.

Wetlands

Wetlands are areas that have vegetation and soil characteristics of a permanently or frequently saturated environment, including swamps, marshes, bogs and similar environments. Wetlands are important groundwater recharge areas that support wildlife, fish and other aquatic life. Wetlands also reduce flooding by detaining storm water. Besides protecting against floods, slowing storm water discharge helps filter impurities that can contribute to surface water and groundwater pollution.

Wetland areas are depicted on the Natural Resources map, Figure 1. Spring Township has sporadic areas of wetlands in the southern portion of the Township. West Reading has a large stretch of wetlands along its northeastern border with the Schuylkill River.

Prime Agricultural Soils

The U.S. Natural Resources (formerly "Soil") Conservation Service (SCS) has established soil capability classes based on each soil type's agricultural productivity. Capability classes range from Class I, soils with few limitations for farming to Class VIII, soils generally unsuitable for farming. Class I and Class II are considered prime agricultural soils and Class III soils are considered of statewide importance for agriculture.

Wyomissing borough has a corridor of Class I-IV soils in the southcentral portion of the borough along the Wyomissing creek corridor. Spring Township is majority prime agricultural soils in the southern portion of the township as well as along its southern and northern borders with Sinking Spring borough.

The protection of the soils most suitable for agricultural activities within Spring Township are more ideal than farming activities in the suburban/urban boroughs of the planning region.

Soil Suitability for On-Site Septic Systems

Depth to bedrock, depth to groundwater and permeability are the primary factors in determining how well a soil type is suited for on-site septic systems. Septic systems in soils that percolate too rapidly can degrade groundwater because impurities are not sufficiently absorbed before they reach the water table. Conversely, soils

that do not drain fast enough can cause the unhealthy surface ponding of wastewater. These soil characteristics are important to consider throughout the Suburban Berks West area where many people rely on private wells and private septic systems rather than public water and sewer service.

Natural Heritage Areas

In 1991, the Pennsylvania Science Office of the Nature Conservancy prepared the Berks County Natural Areas Inventory, a list and mapping of rare and endangered plants, animals and natural habitats in Berks County. In 2014, the Berks County Planning Commission had the inventory updated through the Pennsylvania Natural Heritage Program (PNHP) at the Western Pennsylvania Conservancy. PNHP collects and stores location and baseline ecological information about rare plants, rare animals, unique plant communities, significant habitats, and geologic features in Pennsylvania. The information and maps presented in the inventory provides a useful guide for planning residential or commercial developments, recreational parks or trails, for conserving natural areas, and for setting priorities for the preservation of the most vulnerable habitats.

A Natural Heritage Area (NHA) is an area containing one or more plant or animal species of concern at state or federal levels, exemplary natural communities, or exceptional native biological diversity. NHAs include both the immediate habitat and surrounding lands important in the support of these elements. They are mapped according to their sensitivity to human activities, with designations of Core Habitat and Supporting Landscape areas. The sensitivity of each designation varies significantly according to the particular plant, animal or natural community habitat that the area represents and is discussed in detail in each NHAs Site Description. **Core Habitats** are defined as areas representing critical habitat that cannot absorb significant levels of activity without substantial negative impacts to elements of concern.

Supporting Landscape are defined as areas directly connected to Core Habitats that maintain vital ecological processes and/or secondary habitat that may be able to withstand some lower level of activity without substantial negative impacts to elements of concern.

There are several core habitats which exist in the planning region. In Spring Township there are three core habitats. One is located in the northern corner of the Township while the other two are in the southeast corner. Wyomissing Borough has a linear core habitat along its western border with Spring Township. These Natural Heritage Areas are depicted on the Natural Resources map, Figure 1. These maps do not pinpoint the exact location of the species of concern but rather represent a conservation zone that is critical to the preservation of the site (core habitat), and a zone of potential impacts within the site's watershed (supporting landscape) where applicable.

Woodlands

Woodlands are wildlife habitats that, if destroyed, take decades to replace. The root systems of trees and other vegetation stabilize the soil against erosion, particularly in steep areas. Woodlands are also a scenic resource that provides visual relief from the built environment. Woodlands are the largest riparian buffers for the local water resources. Groundwater and surface water benefits that woodlands provide include cooling of water, saturation of pollutants which would otherwise be carried to the waterways. Spring Township holds the majority of woodlands for the planning region and they are located in the southern portion of the township.

Sinkholes and Subsidize

Much of the central and northern parts of this Region have limestone-based geology. These lands are vulnerable to sinkholes and other types of subsidize that can damage streets, buildings and utility lines. The following section discusses measures that should be considered to address these hazards.

Conservation Plan

Land in the region varies in its suitability for different intensities of development. Some areas, such as flood-prone creek valleys and wetlands, are not suitable for any development. Other areas are only suitable for very low-density development and some areas are appropriate for high-density development.

Open space can be preserved in public, semi-public or private ownership. It is important to preserve open space to:

- recharge groundwater supplies,
- protect the quality of creeks and the groundwater,
- provide an important visual relief between developments,
- preserve areas of scenic beauty, including scenic views,
- avoid development on lands that are prone to erosion or are otherwise not physically suitable for development,
- provide land for recreation, and
- preserve habitats and cover for birds, fish and wildlife.

GOAL: Protect important natural features, with a special emphasis upon the Tulpehocken, Cacoosing and Wyomissing Creeks, other creek valleys, wetlands and steeply sloped woodlands.

This region was a Statewide leader in preserving its creek valleys in attractive parkland - particularly along the Wyomissing and Tulpehocken Creeks. It is essential to maintain vegetation along streams to protect the water quality and fishing habitats. Where this vegetation does not exist, property-owners should be encouraged to plant along the creek beds so that they may help the individual municipalities of the region fulfill requirements of the municipal separate storm sewer permit.

As part of new developments in wooded areas, developers should be required to designate areas of trees that will be removed or preserved. Then suitable measures should be put into place to protect the trees from damage during construction. This should include temporary fencing underneath the canopy of the trees. It is not only important to protect the tree trunks from damage by construction equipment and vehicles, but also to avoid the compaction of soil that can permanently harm the root systems of the trees.

Control development on steeply sloped lands.

Most steeply sloped lands are along the creek valleys and in the southern part of Spring Township. A 15 percent slope would have a rise of 15 feet for every 100 feet of horizontal distance. Moderately steeply sloped lands (15 to 25 percent) are generally only suitable for low density development. Very steep lands (over 25 percent) are generally not suitable for any development. It is important to limit development on steep slopes to avoid the following: erosion problems, excessive stormwater runoff, overly steep roads and driveways, excessive costs to construct and maintain roads and utilities, and destruction of scenic natural resources.

Zoning regulations should control development on steeply sloped lands. For example, if a new principal building would be proposed on steep slopes, large lot sizes could be required.

Carefully manage wooded areas and avoid clear-cutting.

The woodlands in the region add character to the landscape, help preserve the water quality of creeks and provide important wildlife habitats. Trees also are important to providing clean air and control erosion caused by stormwater runoff. Forestry must be allowed under State law. However, clear-cutting of woods should be prohibited, proper erosion controls should be in place for any large-scale tree-cutting, and other appropriate forest management practices should be used.

In development plans, developers should be required to show that they have minimized the removal of stabilized mature trees as part of their project. Great care should be used during construction to minimize the number

of trees that are removed. Trees can add substantial value to a residential lot. As previously stated, during construction, temporary protection fences should be placed around trees to prevent the compaction of root systems by equipment and to prevent damage to tree trunks.

GOAL: Seek to maintain agricultural activities in large portions of Spring Township.

As seen on the Protected Lands map, Figure 3, most of the protected agricultural land is within Spring Township. Most of the farmland is broken up by woods, steep slopes and residential use areas. However, it is still important to encourage farmers to continue to farm. New homes should be located as far from intensive farming operations as is practical. If a portion of a farm is developed, the homes should be located where they will have the least impact upon the farming operations.

Most types of livestock and poultry operations should continue to be allowed in rural areas of the region.

Encourage the Designation of Additional Areas as Agricultural Security Areas.

Portions of Spring Township have been designated as "Agricultural Security Areas" as shown on the Protected Lands map, Figure 3. A farmer voluntarily asks the Township Board of Supervisors to include their land as a Security Area. A Security Area does not result in any additional regulations upon a private property owner, nor upon private development. Once designated within a Security Area, the landowner may, if they wish, ask to have their land be considered by the County for preservation under an Agricultural Easement Program (as described below). Moreover, a Security Area provides a farmer with extra protection against nuisance lawsuits, municipal regulations of agriculture and government condemnation.

Seek agricultural easements to preserve farmland.

The most effective method to permanently preserve farmland is through purchasing the "development rights" of the land. This program uses funds from the State and the County to pay property owners to preserve their land. Property owners voluntarily apply to the County for consideration. The farms are then ranked according to a set of standards, such as the quality of the soils for crops and the proximity to other farms that have been preserved. If selected, the landowner is paid the difference between the market value of the land and the value as farmland. A permanent "Conservation Easement" is then placed on the land that permanently prevents its use for non-agricultural uses. The land remains privately owned and can be sold to another farmer.

Permit a Range of Farm-Based Businesses.

Many farmers cannot earn a full-time living on their farm work. Instead, many farmers need supplemental jobs. To encourage the continuation of farming, the Township's Zoning Ordinance should offer reasonable flexibility to farmers on larger tracts to have small businesses. These businesses could include small engine repair, sharpening services, wood crafting, farm equipment repair, sale of seeds and fertilizers and similar activities. The number of employees and the sizes of the businesses should be limited to prevent it from becoming a major commercial business. These activities can also be useful to encourage the repair and reuse of old barns.

GOAL: Protect the amounts and quality of groundwater and creek waters.

As part of new development, proper measures should be used to protect water quality, avoid soil erosion and promote the recharge of stormwater runoff into the ground. These types of measures are known as "Best Management Practices (BMPs)." A variety of different methods to accomplish these goals are described in the manual entitled "Best Management Practices for Developing Areas in Pennsylvania" and the "Tulpehocken Creek Stormwater Management Plan." The ACT 167 stormwater management plans of the planning region should be revised to continue to fulfill protection requirements of these valuable resources but also to be compliant with the requirements of the NPDES Municipal Separate Storm Sewer (MS4) Permit through the Department of Environmental Protection.

Most new developments are required to submit plans to show how they will avoid soil from eroding and causing sediment in creeks. However, it is equally important to make sure that these proposed measures are actually

put correctly into place, and are repaired as needed after storms. In addition, the individual municipality should continue to maintain and inspect these facilities so that compliance with the MS4 permit is fulfilled.

Carefully Control Large-Scale Withdrawals of Groundwater and Spring Water.

The individual municipalities within the region should have regulations that require careful review and approval of large withdrawals of groundwater and water from springs. The applicant should be required to provide professional hydrological studies showing that the withdrawals will not harm the water supplies of neighboring homes and farms, particularly during drought conditions. This concern particularly involves water bottling operations that remove large volumes of water out of the area. If a large water withdrawal is proposed, it should be accompanied by permanent preservation of substantial amounts of surrounding land to allow sufficient groundwater recharge. The Delaware River Basin Commission (DRBC) is the authority which reviews such withdrawal permits. Continued coordination with the DRBC should be pursued by the planning region.

Maximize groundwater recharge.

The total percentage of a lot that is covered by buildings and paving should be limited to make sure that there are areas available for absorption of stormwater. For parking areas that are not used on a daily basis, alternative surfaces and materials should be considered that encourage groundwater recharge.

Ordinance provisions should be reviewed to make sure that they do not unintentionally increase the amount of land covered by paving. For example, sidewalks should only be required where they are needed. Front yard setbacks should be modest so that long driveways are not needed. Where cul-de-sac streets are used, a landscaped island should be considered in the middle of the cul-de-sac. Excessive amounts of parking should be avoided. Where there is a question about the amount of parking that may be needed, a developer can be allowed to reserve land for parking that would only be paved if the municipality determines it is actually needed after the use has been in operation. Adjacent businesses should be encouraged to share parking, which can reduce the total amount that is needed.

The municipalities within the region should consider participating with the Berks County Source Water protection program to continue the education of the importance of our water resources. The recharge of groundwater and surface water and the protection of that recharge are a necessity to the regional water suppliers.

Carefully design development in limestone areas to avoid sinkholes.

Much of the region includes limestone-based (or “carbonate” or “karst”) geology that is prone to sinkholes. Stormwater runoff has a major role in the creation of sinkholes and other subsidence. To avoid sinkholes, it is essential to carefully design stormwater facilities and to use great care near isolated low spots in the ground, which are known as topical depressions. Also, water line breaks can also result in very severe sinkholes.

In limestone areas, detention basins should be required to have a clay or synthetic liner. Where development is proposed near a sinkhole, the sinkhole should be required to be remediated. This often involves excavating the area and filling it with concrete or other approved material. Sinkholes should be repaired as soon as possible before they expand in an uncontrolled manner. Stormwater should not be directed towards a sinkhole that has not been re-mediated.

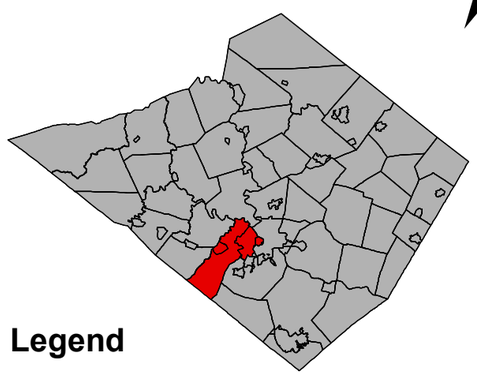
GOAL: Protection of natural resources and regional open space from utilities

The increase of natural gas use within the nation has put pressure on local municipalities which host existing pipeline systems. The municipalities within the Suburban Berks West planning region should have a consistent approach on addressing expanding pipeline utilities and how to protect and preserve the natural features of the region.

FIGURE 1

Sinking Spring, Spring, West Reading, Wyomissing
Joint Comprehensive Plan Update: September 2018

Natural Resources



Legend

- Schuylkill Watershed*
- Tulpehocken Creek Watershed*
- Cocalico Creek Watershed**
- Conestoga River Watershed**
- Subwatersheds
- 1% Floodplain
- 0.2% Floodplain
- Wetlands
- Natural Heritage Area- Core Habitat
- Streams and Water Bodies
- High Quality Streams
- US Route
- State Route
- Railroads
- Municipal

* Drains to Delaware River
** Drains to Susquehanna River

Source data: Berks County Planning Commission GIS, Berks County GIS/IS, Berks County Mapping, Berks DES, FEMA, Western Pennsylvania Conservancy

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North Heidelberg
Bern
Muhlenberg
Heidelberg
Lower Heidelberg
Reading
Wernersville
Sinking Spring
West Reading
Wyomissing
Spring
Kenhorst
Shillington
Mohnton
South Heidelberg
West Cocalico
Cumru
East Cocalico
Brecknock
Robeson
Adamstown

TULPEHOCKEN CREEK
LITTLE CACOOSING CREEK
SCHUYLKILL RIVER
CACOOSING CREEK
WYOMISSING CREEK
LITTLE COCALICO CREEK
LITTLE MUDDY CREEK

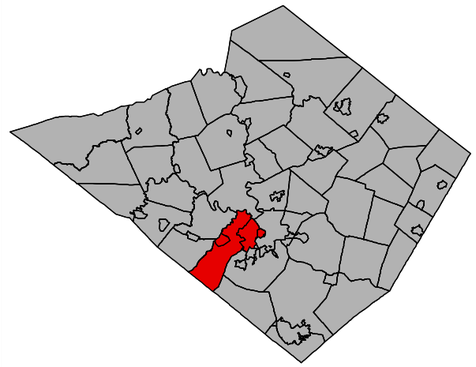
222
422
724
183
272

0 0.5 1 Miles

FIGURE 2

Sinking Spring, Spring, West Reading, Wyomissing
Joint Comprehensive Plan Update: September 2018

Soils



North Heidelberg
Bern
Muhlenberg
Heidelberg
Lower Heidelberg
Bern
Reading
Wernersville
South Heidelberg
Kenhorst
Shillington
Mohnton
West Cocalico
Cumru
East Cocalico
Brecknock
Robeson
Adamstown
222
12
422
183
724
272

0 0.5 1 Miles

Legend

- Class 1 Soil
- Class 2 Soil
- Class 3 Soil
- Class 4-8 Soil
- Poorly Drained Soils
- Roads
- US Route
- State Route
- Railroads
- Municipal Boundaries

Source data: Berks County Planning Commission GIS, Berks County GIS/IS, Berks County Mapping, Berks DES, USDA NRCS

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FIGURE 3

Sinking Spring, Spring, West Reading, Wyomissing
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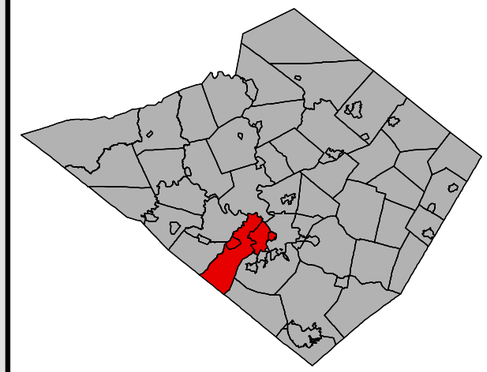
Protected Land



Legend

- Agricultural Security Area
- Berks County Agricultural Conservation Easement
- Streams and Water Bodies
- US Route
- State Route
- Roads
- Railroads

Source data: Berks County Planning Commission GIS, Berks County GIS/IS, Berks County Mapping, Berks DES

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0 0.5 1 Miles

FIGURE 4

Sinking Spring, Spring, West Reading, Wyomissing
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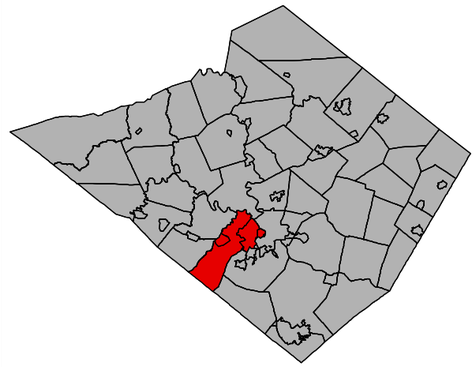
Geology



Geologic Period

- Precambrian
- Cambrian
- Ordovician
- Triassic
- Jurassic
- Streams and Water Bodies
- Roads
- Railroads
- Municipal Boundaries

Source data: Berks County Planning Commission GIS, Berks County GIS/IS, Berks County Mapping, Berks DES, USDA NRCS

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FIGURE 5

Sinking Spring, Spring, West Reading, Wyomissing
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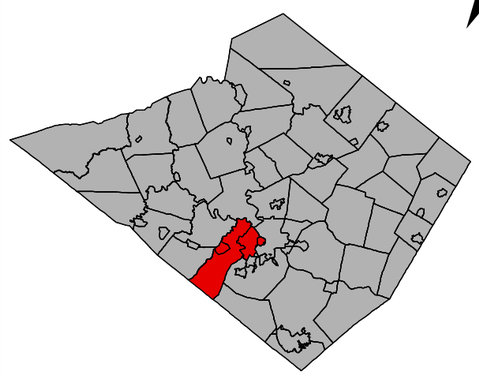
MS4 Areas



N

North Heidelberg
Bern
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Lower Heidelberg
Reading
Wernersville
South Heidelberg
Kenhorst
Shillington
Mohnton
West Cocalico
Cumru
East Cocalico
Brecknock
Robeson
Adamstown
Spring
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West Reading
Wyomissing

TULPEHOCKEN CREEK
LITTLE CACOOSING CREEK
SCHUYLKILL RIVER
CACOOSING CREEK
WYOMISSING CREEK
LITTLE COCALICO CREEK
LITTLE MUDDY CREEK

222
422
724
183
272

0 0.5 1 Miles

Legend

- Urbanized Area 2000
- Urbanized Area 2010
- Schuylkill Watershed*
- Tulpehocken Creek Watershed*
- Cocalico Creek Watershed**
- Conestoga River Watershed**
- Subwatersheds
- Streams and Water Bodies
- US Route
- State Route
- Railroads
- Municipal Boundaries

* Drains to Delaware River
** Drains to Susquehanna River

Source data: Berks County Planning Commission GIS, Berks County GIS/IS, Berks County Mapping, Berks DES, U.S. Census Bureau

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